MODIFICATION NO. M090
SUPPLEMENTAL AGREEMENT TO
CONTRACT NO. DE-AC02-98CH10886

MODIFICATION NO. M090

CONTRACTOR AND ADDRESS:	Brookhaven Science Associates, LLC Brookhaven National Laboratory Upton, NY 11973
MODIFICATION FOR:	Restructuring the format of the Contract to follow the uniform standard format and updated clause to reflect current FAR and DEAR

THIS MODIFICATION, effective the 13th day of January 2003, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), as represented by the UNITED STATES DEPARTMENT OF ENERGY (hereinafter referred to as "DOE"), and BROOKHAVEN SCIENCE ASSOCIATES, LLC (hereinafter referred to as the "Contractor"),

WITNESSETH THAT:

WHEREAS, the Government and the Contractor entered into Contract No. DE-AC02-98CH10886 on the 5th day of January 1998, for the operation of the Brookhaven National Laboratory; and

WHEREAS, said contract has been modified previously, and the parties desire to modify said contract further, as hereinafter provided; and

WHEREAS, this modification is authorized by law, including 41 U.S.C. 252(c)(15), P.L. 95-91 and other applicable law;

NOW, THEREFORE, said contract, as modified previously, is hereby further modified as follows:

1. Contract: Restructure the entire Contract, including all Articles and Appendices, to follow the standard uniform contract format as stated on Standard Form 26 (Rev 4-85) and update various clauses to reflect current FAR and DEAR.

IN WITNESS WHEREOF, the parties have executed this document.

UNITED STATES OF AMERICA
DEPARTMENT OF ENERGY

BY: _____
Robert P. Gordon
Contracting Officer
(Title)
DATE: 1-13-03

BROOKHAVEN SCIENCE ASSOCIATES, LLC

BY: _____
Brian P. Sack
Chief Financial Officer
(Title)
DATE: 1/13/03

AWARD/CONTRACT	1. THIS CONTRACT IS RATED ORDER UNDER DPAS (15 CFR 350)	RATING	PAGE OF PAGES
		N/A	1 | 1

2. CONTRACT (*Proc. Inst. Ident.*) NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQUEST/PROJECT NO.
DE-AC02-98CH10886.M090	See Block 20C	02-03CH10886.006

5. ISSUED BY CODE	6. ADMINISTERED BY (*If other than Item 5*) CODE
U.S. Department of Energy Chicago Operations Office 9800 S. Cass Avenue Argonne, IL 60439	U. S. Department of Energy Chicago Operations Office Brookhaven Area Office 53 Bell Avenue Upton, New York 11973

7. NAME AND ADDRESS OF CONTRACTOR (*No. street, city, county, State and ZIP Code*)	8. DELIVERY N/A ☐ FOB ORIGIN ☐ OTHER (*See below*) 9. DISCOUNT FOR PROMPT PAYMENT N/A 10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN ▶ ITEM N/A
Brookhaven Science Associates, LLC P.O. Box 5000 Upton, New York 11973-5000	
CODE N/A FACILITY CODE N/A	

11. SHIP TO/MARK FOR CODE	12. PAYMENT WILL BE MADE BY CODE
N/A	Same as Item 6

13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:	14. ACCOUNTING AND APPROPRIATION DATA
☐ 10 U.S.C. 2304(c) ( ) ☒ 41 U.S.C. 253(c) (3)	N/A

15A. ITEM NO	15B. SUPPLIES/SERVICES	15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT
N/A	See the Attached Schedule	N/A	N/A	N/A	See Clause B.2.

15G. TOTAL AMOUNT OF CONTRACT ▶ $ See Clause B.2.

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X	B	SUPPLIES OR SERVICES AND PRICES/COSTS	2			PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACH.	
X	C	DESCRIPTION/SPECS./WORK STATEMENT	18	X	J	LIST OF ATTACHMENTS	1
X	D	PACKAGING AND MARKING	2			PART IV - REPRESENTATIONS AND INSTRUCTIONS	
X	E	INSPECTION AND ACCEPTANCE	2		K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
X	F	DELIVERIES OR PERFORMANCE	3				
X	G	CONTRACT ADMINISTRATION DATA	2		L	INSTRS., CONDS., AND NOTICES TO OFFERORS	
X	H	SPECIAL CONTRACT REQUIREMENTS	22		M	EVALUATION FACTORS FOR AWARD	

CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE

17. ☒ CONTRACTOR'S NEGOTIATED AGREEMENT (*Contractor is required to sign this document and return* 2 *copies to issuing office.*) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)

18. ☐ AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

19A. NAME AND TITLE OF SIGNER (Type or print)	20A. NAME OF CONTRACTING OFFICER
Brian P. Sack, Chief Financial Officer	Robert P. Gordon
19B. NAME OF CONTRACTOR Brookhaven Science Associates, LLC BY _____ (Signature of person authorized to sign)	19C. DATE SIGNED 1/13/03
20B. UNITED STATES OF AMERICA BY _____ (Signature of Contracting Officer)	20C. DATE SIGNED 1-13-03

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19A. NAME AND TITLE OF SIGNER (Type or print)	20A. NAME OF CONTRACTING OFFICER
Brian P. Sack, Chief Financial Officer	Robert P. Gordon

19B. NAME OF CONTRACTOR	19C. DATE SIGNED	20B. UNITED STATES OF AMERICA	20C. DATE SIGNED
Brookhaven Science Associates, LLC BY _____ (Signature of person authorized to sign)	1/13/03	BY _____ (Signature of Contracting Officer)	1-13-03

PART I

SECTION B

SUPPLIES OR SERVICES AND PRICES/COSTS

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PART I

SECTION B - SUPPLIES OR SERVICES AND PRICES/COSTS

B.1 - SERVICE BEING ACQUIRED

This contract provides for the continuation of work performed under Contract No. DE-AC02-98CH10886 effective January 5, 1998.

The Contractor shall provide the personnel, facilities, equipment, materials, supplies, and services, (except such facilities, equipment, materials, supplies and services as are furnished by the Government), and shall perform in a quality, timely, and cost-effective manner the Statement of Work (SOW) set forth in Part I, Section C.1 of this contract.

B.2 - OBLIGATION OF FUNDS AND FINANCIAL LIMITATIONS

The amount presently obligated by the Government with respect to this contract is specified in Clause I.104 - DEAR 970.5232-4 - Obligation of Funds (DEC 2000). Other financial limitations are also specified in Clause I.104 - DEAR 970.5232-4 - Obligation of Funds (DEC 2000).

B.3 - FEES

The fees payable, earned or earnable by the Contractor for the performance of the work under this contract from its inception through January 4, 2003 are specified in Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts) (JUN 1997) (Deviation).

PART I

SECTION C

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PART I

SECTION C - DESCRIPTION/SPECS./WORK STATEMENT

C.1 – Statement of Work

(a) General

The Contractor shall provide the intellectual leadership and management expertise necessary and appropriate to manage, operate, and staff the Brookhaven National Laboratory (BNL, or the Laboratory); to accomplish the missions assigned by the Department of Energy (DOE or the Department) to the Laboratory; and to perform all other work described in this Statement of Work. DOE missions are assigned through strategic planning, program coordination, and cooperation between the Contractor and DOE.

Inasmuch as the assigned missions of the Laboratory are dynamic, this Statement is not intended to be all-inclusive or restrictive, but is intended to provide a broad framework and general scope of the work to be performed at the Laboratory. This Statement does not represent a commitment to, or imply funding for, specific projects or programs. All projects and programs will be authorized individually by DOE and/or other work sponsors in accordance with the provisions of this contract.

Work under this contract shall be conducted in a manner that protects the environment and assures the safety and health of employees and the public. In performing the contract work, the Contractor shall implement appropriate program and project management systems to track progress and maximize cost-effectiveness of work activities; develop integrated plans and schedules to achieve program objectives, incorporating input from DOE and stakeholders; maintain sufficient technical depth to manage activities and projects throughout the life of a program; utilize appropriate technologies to reduce costs and improve performance; and maintain Laboratory facilities as necessary to accomplish assigned missions.

(b) Mission and Major Programs

The Laboratory's mission statement will be documented annually and updated as necessary in the Institutional Plan. In support of major DOE sponsor organizations, the central mission of the Laboratory is to provide national scientific leadership and technological innovation to support DOE's objectives and programs.

BNL is dedicated to basic and applied investigation in a multitude of scientific disciplines, including experimental and theoretical physics, medicine, chemistry, biology, environmental research, and engineering. Major BNL facilities include the High Flux Beam Reactor (HFBR), the Brookhaven Medical Research Reactor (BMRR), the Alternating Gradient Synchrotron (AGS) complex, the National Synchrotron Light Source (NSLS), and the Hazardous Waste Management Facility. The advanced national user facilities such as NSLS, AGS, HFBR, BMRR, and the Spallation Neutron Source (as described in Appendix M) and, when complete, the relativistic heavy ion collider, will be operated, or when it becomes appropriate, shutdown, in full recognition of all environmental, health and safety considerations. The two reactors and the two synchrotrons (also referred to as accelerators) are used for a variety of research, most notably in high and medium energy physics, isotope production, material science, medical science, solid state physics, chemistry, biology, environmental science, and geo-science. Experiments are conducted in a wide range of areas, such as high energy collisions, radiobiology, photochemistry, and trace chemical composition. Many of the research activities at BNL are designed and conducted by university and industry users, with BNL maintaining the facilities and ensuring that provisions are in place to perform the activities safely and effectively.

(1) Laboratory Goals

The Laboratory's mission addresses four distinct goals: (i) performance of research in a multi-disciplinary context in the energy sciences, general sciences, biosciences, computational sciences, and other areas in a manner that ensures employee and public safety and protection of the environment; (ii) development and safe and effective operation of unique national experimental facilities that are available to qualified investigators; (iii) assistance in the education and training of future generations of scientists and engineers to promote national science and education goals; and (iv) transfer of knowledge and technological innovations and fostering of productive relationships among Laboratory research programs, universities, and industry to promote national economic competitiveness. The Contractor shall provide for the participation of the community and other stakeholders in the performance of its mission.

(2) Primary Program Sponsors

Work under this contract includes scientific and technical programs sponsored by major DOE organizations. Primary DOE sponsors include:

Energy Research
Environment, Safety and Health
Energy Efficiency and Renewable Energy
Nuclear Energy
Environmental Management
Fossil Energy
Defense Program
Other DOE Contractors
Nonproliferation and National Security

Additionally, the Contractor may be authorized to pursue other DOE and non-DOE missions [most notably those of the Nuclear Regulatory Commission (NRC) and the National Institutes of Health (NIH)] that derive from the Laboratory's missions and utilize the Laboratory's core competencies.

A summary of current Laboratory programs follows. Descriptions of major programs are to be updated annually in the Institutional Plan.

(3) Energy Research Programs

(i) Basic Energy Sciences. The Contractor shall conduct research in broad areas of materials sciences, geosciences, chemical sciences, and biosciences. Programs in materials sciences currently emphasize forefront research projects in the characterization and fundamental properties of advanced materials and the chemistry and physics of surfaces and condensed matter. Programs in chemical sciences currently emphasize chemical physics, dynamics and mechanisms of chemical reactions, catalysis, electrochemistry, and photochemistry. Programs in geosciences currently emphasize the geochemistry of sulfur in sediments and fluid-rock interactions. Programs in biosciences currently emphasize molecular plant genetics and energy conversion during photosynthesis. Programs that take advantage of the unique scientific user facilities in materials sciences and related disciplines available at the Laboratory - for example, the National Synchrotron Light Source and the High Flux Beam Reactor are to be encouraged. The Contractor shall manage all aspects of designated scientific user facilities, which serve the needs of academic, industrial, and government scientists.

(ii) Computational and Technology Research. The Contractor shall conduct computational research including applied mathematical sciences, computer sciences, and computational sciences. The research shall emphasize both excellence and relevance, such that advances in mathematics and computer science help the

Department to solve its most pressing mission-related problems. Teaming and collaboration, which bring different skills together to focus on common problems, shall be actively encouraged. To this end, the Contractor shall create and maintain an environment that reinforces collaboration with the best researchers, irrespective of where they are located, be that within the Laboratory, at other laboratories, or at universities, within the U.S. or around the world.

The Contractor shall conduct programs in technology research, employing various modes of working with industrial partners, such as multi-year, cost-shared, cooperative research and development agreements and quick response projects which allow access by small businesses to the Laboratory's research capabilities. These projects are implemented through a variety of flexible mechanisms, such as personnel exchanges and technical assistance to and consultations with small businesses. Research topics shall be chosen that emphasize both excellence in basic research and relevance to industrial partners. The Contractor shall also conduct innovative research to explore the scientific feasibility of novel energy-related concepts in a principal-investigator mode. In this case, research topics shall be chosen such that within three years they can be taken from basic concept to the point that choices can be made about their value for development.

The Contractor shall devote appropriate attention to the management of information systems that support major experiments and other scientific data-intensive resources so as to assure their timeliness, utility, cost-effectiveness, and responsiveness to customers.

(iii) High Energy and Nuclear Physics. The Contractor shall conduct Nuclear Physics research in the areas of relativistic heavy ions, structure of nuclei using medium energy probes, and solar neutrinos, and shall support efforts in nuclear data storage, evaluation and dissemination. Research in High Energy shall include investigation into the fundamental properties of matter and energy and the basic forces of nature using primarily hadron beams. In both areas, work shall include research into forefront

technologies for accelerator and detector design and construction. Work shall include operation of the AGS accelerator and its various injectors for basic research and the Relativistic Heavy Ion Collider (RHIC), for nuclear physics and particle research, scheduled for completion and initiation of experiments in FY 1999. The Contractor shall support transition of the Alternating Gradient Synchrotron (AGS) from a facility primarily operated for fundamental research to a facility whose primary purpose is the injection of particles into the (RHIC) ring in FY 1999. The Contractor will complete existing projects, such as RHIC, and initiate new projects as supported by DOE.

(iv) Biological and Environmental Research. The Contractor shall conduct programs on structural biology, nuclear medicine and functional imaging, molecular and cellular biology, atmospheric science, marine bioscience, and bioremediation that build on the unique facilities and expertise available at the Laboratory, such as the Brookhaven Medical Research Reactor.

(4) Environmental Management

The Contractor shall plan and execute the DOE's Environmental Management Program (EM) activities in accordance with DOE program goals, initiatives, strategies, guidance letters, and approved project baselines in areas such as: (i) Environmental remediation and facility deactivation, decommissioning, decontamination, and demolition in accordance with the site's CERCLA interagency agreement, (ii) Storage, treatment, and disposal of all regulated waste streams generated on site or existing from previous operations in accordance with applicable regulations and best management practices; (iii) Construction and maintenance of facilities to provide adequate protection of the public, employees, the environment and Government-owned materials, facilities, and equipment in support of the overall EM mission; (iv) Implementation of waste minimization and pollution prevention initiatives; (v) Research and development tasks to support technologies to reduce costs and improve efficiencies in environmental arena. Deployment of technologies in demonstration programs, actual remediation, and/or routine waste operations, as well as to the commercial sector should be emphasized as a final goal for any research and development.

The environmental management program shall be conducted in a manner which leads to increasing DOE, regulatory and public confidence in clean up efforts. Program elements will include: (i) implementing comprehensive project management systems to track progress, maintain regulatory compliance, and increase cost

effectiveness of work activities; (ii) developing integrated plans and schedules for involving the participation of DOE, regulators, and other stakeholders in decision making and priority setting of environmental restoration and waste management activities; (iii) maintaining technical depth to propose and implement clean up activities commensurate with commercial practices in the areas of cost, implementability, schedule and public acceptability.

Specific responsibilities include:

(i) Environmental Restoration. The Contractor shall establish and maintain systems to effectively manage and implement environmental restoration program in accordance with goals and objectives set forth by the Department. The systems must ensure that the technical approach is consistent with DOE cleanup strategies to complete all Record of Decisions by the end of FY 1998; to implement an overall system to effectively manage all groundwater and contaminated soil cleanup activities; to expedite final disposition of facilities awaiting decommissioning and decontamination; and to achieve delisting from the National Priority Listing. Contractor support shall be provided to DOE as requested by the Contracting Officer.

(ii) Waste Management. Based on DOE funding guidance and other guidance documents, all waste management activities shall be managed in an integrated manner such that waste is managed consistently and in compliance with all applicable regulatory requirements. Plans for all waste, whether generated by processing, manufacturing, research activities, or site clean-up activities, shall be fully implemented to provide appropriate characterization, treatment, storage, transportation, disposal and technology development. Waste management activities include: (A) timely characterization, consolidation, segregation and storage of waste; (B) treatment that complies with storage and/or disposal criteria; (C) efficient shipment of waste for treatment, storage and/or disposal; (D) maintaining sufficient and compliant waste storage space at the Laboratory to accommodate waste generation and waste backlog; and (E) implementation of an effective site wide waste minimization and pollution prevention programs.

Based on DOE funding guidance and other guidance documents, the Contractor shall provide responsive and complete waste management services for characterization, treatment and storage through the appropriate use of existing facilities, new facilities, other DOE facilities, and private sector capabilities. Additionally,

the Contractor shall implement control systems which integrate research and waste management programs to assure DOE that hazardous and radiological waste will not be stockpiled at the site.

The Contractor's short and long range plans and activities for treatment, storage and disposal must be coordinated and integrated with DOE's national waste management program and the DOE, EM and CH Strategic Plans.

The Contractor shall fully integrate all research, environmental remediation, and operations activities so that all regulatory requirements and Federal Facility Agreements or consent orders related to the generation, characterization, treatment, storage and disposal of hazardous waste are met.

(iii) Environmental Technology Development. Where appropriate, the Contractor shall conduct research and development of technology to resolve complex and diverse environmental problems associated with the Department's missions. The Contractor shall identify technology needs and application/insertion points for technologies that can reduce costs and improve performance and conduct research and development activities to support development and deployment of needed technologies. The Contractor shall require that technology development efforts are coupled with technology deployment initiatives and that practical deployment of BNL developed technology to the commercial sector is a primary goal for technology development.

(5) Technology Transfer Programs

The Contractor shall contribute to U.S. technological competitiveness through research and development partnerships with industry that capitalize on the Contractor's expertise and facilities. Principal mechanisms to effect such contributions are: cooperative research and development agreements, access to user facilities, reimbursable work for non-DOE activities, personnel exchanges, licenses, and subcontracting.

The Contractor shall cooperate with industrial organizations to assist in increasing U.S. industrial competitiveness, by assisting in the application of energy science and technology R&D. Such cooperation may include an early transfer of information to industry by arranging for the active participation by industrial representatives in the Contractor's programs.

Cooperation with industrial partners may include long-term strategic partnerships aimed at commercialization of Laboratory inventions or the improvement of industrial products. The Contractor shall respond to specific near-term technological needs of industrial companies with special emphasis given to working with small, small disadvantaged and women-owned businesses. The Contractor may also capitalize on its location in the Northeast by developing productive relationships with regional and local companies and through forums such as conferences, workshops, and traveling presentations. It is anticipated that these organizations will be particularly effective participants in the Laboratory's technology transfer activities in promoting a mutually beneficial relationship between DOE and the communities surrounding the Laboratory.

Cooperation may also include use by industrial organizations of Laboratory facilities and other assistance as may be authorized, in writing, by the Contracting Officer;

(6) University and Science Education Program

The Contractor shall work with colleges and universities, with special emphasis on Historically Black Colleges and Universities/Minority Institutions, and initiate new programs to enhance science and mathematics education at all levels. The Contractor shall encourage participation by a diverse group of faculty and students in Laboratory programs to bring their talents to bear on important research problems and contribute to the education of future scientists and engineers. The Contractor shall also conduct programs for students and faculty to enrich mathematics and science education. A particular purpose of these programs is to encourage members of under-represented societal groups to enter careers in science and engineering.

The Contractor shall maintain its programs of cooperation with the academic and educational community and with nonprofit research institutions for the purpose of promoting research and education in scientific and technical fields of interest to DOE's programs. This cooperation may include, but is not limited to, such activities as: (i) joint experimental programs with colleges, universities, and nonprofit research institutions; (ii) interchange of college and university faculty and Laboratory staff; (iii) student/teacher educational research programs at the pre-collegiate and collegiate level; (iv) post-doctoral programs; (v) arrangement of regional, national, or international professional meetings or symposia; (vi) use of special Laboratory facilities by colleges, universities, and nonprofit research institutes; or, (vii) provision of unique experimental materials to colleges, universities, or nonprofit research institutions or to qualified members of their staffs.

(7) International Collaboration

In accordance with DOE policies, and in consultation with DOE, the Contractor shall maintain a broad program of international collaboration in areas of research of interest to the Laboratory and to DOE.

(8) Other Programs

The Contractor is responsible for the conduct of such other programs and activities as the Parties may mutually agree, including: (i) The providing of the facilities of the Laboratory to the personnel of public and private institutions for the conduct of research, development, and demonstration work, either within the general plans, programs and budgets agreed upon from time to time between DOE and the Contractor, or as may be specifically approved by DOE. The Laboratory facilities shall be made available on such other general bases as DOE may authorize or approve; (ii) The conduct of research and development work for non-DOE sponsors which is consistent with and complementary to the DOE's mission and the Laboratory's mission under the contract, and does not adversely impact or interfere with execution of DOE-assigned programs, does not place the facilities or Laboratory in direct competition with the private sector and for which the personnel or facilities of the Laboratory are particularly well adapted and available, as may be authorized, in writing, by the Contracting Officer; (iii) The dissemination and publication of unclassified scientific and technical data and operating experience developed in the course of the work; (iv) The furnishing of such technical and scientific assistance (including training and other services, material, and equipment), which are consistent with and complementary to the DOE's and Laboratory's mission under this contract, both within and outside the United States, to the DOE and its installations, Contractors, and interested organizations and individuals.

(c) Administration and Operation of the Laboratory

The Contractor is responsible for the operation, including management and maintenance, of the Laboratory including the planning in consultation with DOE and the making of recommendations to DOE for new buildings, facilities and utilities and alteration of existing buildings, facilities, and utilities on the Laboratory site and elsewhere, including the furnishing of all necessary basic design and operating criteria. When requested by DOE, the Contractor shall provide for the design, engineering, construction, and alteration, by subcontract or otherwise, of such buildings, facilities, and utilities on the Laboratory site and elsewhere as authorized or approved, in writing, from time to time by DOE. Before proceeding with other than design aspects of any project which the

Contractor, acting in good faith, considers may reasonably be within the coverage of the Davis-Bacon Act (40 U.S.C. 276a and following), the Contractor shall obtain a written determination by the Contracting Officer as to the applicability of the Davis-Bacon Act to such project. When it is determined that the Davis-Bacon Act does cover a particular work project, the Contractor shall procure by subcontract the covered work in accordance with DOE approved procedures.

(1) Strategic and Institutional Planning

The Contractor shall perform overall integrated planning, including strategic planning and the development of an annual strategic plan, covering all programs, issues and needs including, acquisition, upgrades, and management of Government-owned, leased or controlled facilities, supporting infrastructure and real property located at the site.

(2) Protection of the Worker, the Public and the Environment

The safety and health of workers and the public and the protection and restoration of the environment are fundamental responsibilities of the Contractor. Accordingly, the Contractor shall: (i) Take necessary actions, to minimize serious injuries and/or fatalities and prevent worker exposures and environmental releases in excess of established limits; (ii) Establish clear environmental, safety, and health priorities and manage activities in proactive ways that effectively increase protection to the environment and to public and worker safety and health; and, (iii) Carry out all activities in a manner that complies with human health, safety and environmental regulations; minimizes wastes; and complies with applicable regulatory requirements and DOE Directives.

The Contractor shall put in place a system that clearly communicates the roles, responsibilities, and authorities of line managers, and that holds line managers accountable for work practices and performance in a manner that ensures protection of workers, the public and the environment. Specifically, (i) the Laboratory Director shall hold direct reports accountable, for strong leadership and management of risks within their area of responsibility; (ii) line managers shall be responsible for understanding the hazards associated with, and controls necessary for, safe performance of work; and (iii) the ES&H program shall be operated as an integral, but visible, part of how the organization conducts business, including prioritizing work and allocating resources based on risk reduction.

The Contractor shall establish effective management systems to identify deficiencies, resolve them in a timely manner, ensure that corrective actions are implemented, (addressing the extent of conditions, root

causes, and measures to prevent recurrence) and prioritize and track commitments and actions.

The Contractor shall establish a structured, standards-based approach to planning and control of work including identification and implementation of ES&H standards and requirements that are appropriate for the work to be performed and related hazards.

The Contractor shall put in place an organization that supports effective ES&H management by ensuring appropriate levels of ES&H staffing and competence at every level. Specifically, Contractor shall assure that employees are trained, qualified, and involved in aspects of the organization's activities, including providing input to the planning and execution of work, and identification, mitigation/elimination of workplace hazards. Contractor shall, similarly, assure that subContractor employees are trained and qualified on job tasks, hazards, and Departmental safety policies, expectations, and requirements, and shall flow ES&H requirements down to subContractors.

The Contractor must ensure that a Chronic Beryllium Disease Prevention Program (CBDPP) is prepared for the facility that meets the general CBDPP requirements specified in Appendix N.

Finally, the Contractor shall promote effective environmental program management, consistent with the tenets of ISO 14001. (Environmental Systems Management).

(3) Community Involvement

The Contractor shall have, as one of its highest priorities, the development and implementation of a systematic approach and commitment to involving the community in all aspects of the Laboratory. Reflecting the Department's strategic objectives and public participation policy, DOE and the Contractor agree to carryout communications and community involvement activities to achieve the following:

- Brookhaven's and DOE's vision, mission, performance and contributions to science, technology and national competitiveness in the global marketplace are recognized and valued;

- Brookhaven and DOE are trusted and trusting, both internally and externally;

- Brookhaven and DOE internal and external communications are timely, open and of high quality;

- Brookhaven and DOE listen and respond to stakeholders, customers and partners in a fair and open process that encourages participation;

- All members of the Brookhaven and DOE families serve the communications needs of their internal and external stakeholders and customers knowledgeably and responsively; and

- All members of the Brookhaven and DOE family see themselves as part of a community of service sharing a common vision and applying core values.

Refer to Clause I.64 - DEAR 952.204-75 - Public Affairs, for more detail.

(4) Maintenance

In accordance with DOE standards, the Contractor shall maintain physical assets in a manner which ensures continuity of operation, fulfillment of program requirements, and ensures the property will satisfy the requirements of current use.

(5) Business Management

(i) Human Resources Management. The Contractor shall establish and maintain human resource systems which attract and retain outstanding employees, and continually motivate them to achieve high productivity in scientific research and Laboratory operations.

The Contractor also shall create and maintain at the Laboratory an environment that promotes diversity and fully utilizes the talents and capabilities of a diverse workforce. The Contractor shall seek to recruit a diverse workforce by promoting and implementing DOE and Laboratory goals. Special consideration will be given to Historically Black Colleges and Universities/Minority Institutions as potential resource pools. The Contractor shall also strive to promote diversity in all of the Laboratory's subcontracting efforts with emphasis on the use of small, small disadvantaged and women-owned businesses.

(ii) Financial Management. The Contractor shall maintain a financial management system responsive to the obligations of sound financial stewardship and public accountability. The overall system shall include an integrated accounting system suitable to collect, record, and report all financial activities; a budgeting system which includes the formulation and executions of all

resource requirements needed to accomplish projected missions and formulate short- and long-range budgets; an internal control system for all financial and other business management processes; and a disbursements system for both employee payroll and supplier payments.

(iii) Purchasing Management. The Contractor shall have a DOE-approved purchasing system to provide purchasing support and subcontract administration. The Contractor shall, when directed by DOE and may, but only when authorized by DOE, enter into subcontracts for the performance of any part of the work under this Contract.

(iv) Other Administrative Services. The Contractor shall provide other administrative services, including logistics support to the DOE-CH Brookhaven Group.

(6) Safeguards and Security. The Contractor shall provide a safeguards and security program for the protection of Laboratory assets. The level of protection must be appropriate and cost-effective in response to the value of the assets, the potential threat and DOE directives and standards. The Contractor shall provide all the personnel necessary for a protective force consisting of uniformed guards and security inspectors.

(7) Legal Services. The Contractor shall maintain legal support for contract activities, including those related to patents, licenses, and other intellectual property rights; subcontracts; technology transfer; environmental compliance and protection; labor relations; and litigation and claims.

(8) Emergency Management. The Contractor shall conduct an emergency management system to include emergency preparedness plans and procedures, and occurrence notification and reporting system, operation of an Emergency Operations Center and emergency response capabilities for local, regional, and national missions to include a Radiological Assistance Program, an Accident Response Group, and a Nuclear Emergency Response Team.

(9) Information Resources Management. The Contractor shall maintain information systems for organizational operations and for activities involving general purpose programming, data collection, data processing, report generation, software, electronic and telephone communications, and computer security. Contractor shall provide computer resource capacity and capability sufficient to support

Laboratory-wide information management requirements. The Contractor also shall conduct a records management program.

(10) Self-Assessment Program. The Contractor shall conduct an ongoing self-assessment process that continually samples and validates actual program practice with prescribed DOE and Laboratory policies, standards and procedures.

(d) Reports and Other Deliverables

The Contractor shall prepare, submit, disseminate, or otherwise public financial, schedule, scientific, and technical performance plans and reports; and other information and deliverables consistent with the needs of the various programmatic sponsors and other customers, or as required elsewhere in this Contract or as specifically required by the Contracting Officer.

(e) General Responsibilities of the Parties

(1) DOE Responsibilities

DOE is responsible for all activities conducted under this contract and for assuring that Government funds are properly and effectively utilized. Accordingly, the proper discharge of such responsibilities requires that DOE shall have the authority to:

(i) exercise appropriate general control over the contract work;

(ii) have full access to information concerning performance of such work;

(iii) conduct periodic and other appraisals of programmatic, project and managerial objectives and milestones and consult with the Contractor regarding these and other matters of mutual interest; and

(iv) in accordance with other provisions of the contract, have the authority to review and approve major policies and procedures affecting administrative and operating areas.

(2) Contractor Responsibilities

The Contractor shall be responsible for the diligent and vigorous performance of the contract work in accordance with its best scientific, technical, managerial and administrative judgements. Accordingly, the proper discharge of such responsibility requires that the Contractor shall:

(i) formulate and establish Laboratory policies and programs;

(ii) exercise appropriate managerial control over the programmatic and operational activities of the Laboratory;

(iii) respond, in a timely manner, to recommendations made by DOE as a result of its appraisals;

(iv) have the right to be kept continually advised, where pertinent, of DOE's current short and long-term objectives, and to confer with DOE with respect thereto and in connection with the formulation of plans or policies which may have a significant effect upon the Laboratory;

(v) establish policies and objectives for cooperative research and educational programs between the scientific and technological community and the Laboratory; and

(vi) cooperate in every reasonable way with individuals or groups whose expert or consultative services DOE may choose to use to review and evaluate the scientific, technical, or other aspects of the contract work.

(f) Commitments of the Contractor

(1) Community Involvement. Contractor's overall strategy is expected to achieve the following objectives by the close of FY 1999:

(i) Evidence of organizational and cultural change regarding community involvement, (i.e., development and implementation of a strong, integrated and proactive community involvement/communications program).

(ii) Indications of agreement within the community that their substantive concerns (e.g., groundwater contamination) have been or are being adequately addressed.

(iii) Evidence of the community's increased understanding and respect for the Laboratory mission and contribution to science and technology.

(iv) Reports from the community of positive and multiple relationships with the Laboratory and expressions of confidence in the Laboratory's decision-making processes.

(v) Evaluations of the success of community involvement through periodic surveys.

(2) ISO 14001.

(i) By the end of FY 1998, Contractor will recommend to DOE which programs/projects/operations should be pursued for third-party certification.

(ii) For those programs/projects/operations having potentially high environmental impact, as approved by DOE, Contractor will achieve certification by the end of FY 2000.

(iii) Contractor intends to achieve self-declaration for the Laboratory as a whole by mid FY 2000.

(3) Integrated Safety Management.

(i) Contractor intends to achieve interim validation at the local level for its Laboratory-wide ISM system by the first quarter of FY 2000.

(ii) Contractor expects to achieve independent validation of its ISM system by DOE HQ by the end of FY 2000.

(iii) Contractor will implement the performance-based tenets of DOE's Voluntary Protection Program as part of ISM and seek appropriate recognition consistent with DOE's needs.

C.2 - PLANS AND REPORTS

The Contractor shall submit periodic plans and reports, in such form and substance as required by the Contracting Officer. These periodic plans and reports shall be submitted at the interval, and to the addresses and in the quantities as specified by the Contracting Officer. Where specific forms are required for individual plans and reports, the Contracting Officer shall provide such forms to the Contractor. The Contractor shall require subcontractors to provide reports that correspond to data requirements the Contractor is responsible for submitting to DOE. Plans and reports which may be submitted in compliance with this provision are in addition to any other reporting requirements found elsewhere in other clauses of this contract. It is the intention of DOE to consult with the Contractor in determining the necessity, form and frequency of any reports required to be submitted by the Contractor to DOE under this contract.

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SECTION D

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SECTION D - PACKAGING AND MARKING

D.1 - PACKAGING

Preservation, packaging, and packing for shipment or mailing of all work delivered hereunder shall be in accordance with good commercial practice and adequate to insure acceptance by common carrier and safe transportation at the most economical rates.

D.2 - MARKING

Each package, report or other deliverable, which requires tracking in the BNL Correspondence and Commitment (CCTS) tracking system, shall be accompanied by a letter or other document which:

(a) Identifies the contract number under which the item is being delivered.

(b) Identifies the contract requirement or other instruction which requires the delivered item(s).

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SECTION E

INSPECTION AND ACCEPTANCE

E.1 - FAR 52.246-9 - Inspection of Research and Development (Short Form) (APR 1984)

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SECTION E - INSPECTION AND ACCEPTANCE

E.1 - FAR 52.246-9 - INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM) (APR 1984)

The Government has the right to inspect and evaluate the work performed or being performed under the contract, and the premises where the work is being performed, at all reasonable times and in a manner that will not unduly delay the work. If the Government performs inspection or evaluation on the premises of the Contractor or a subcontractor, the Contractor shall furnish and shall require subcontractors to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

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SECTION F - DELIVERIES OR PERFORMANCE

F.1 - PERIOD OF PERFORMANCE

This contract was effective January 5, 1998 and shall continue up to and including January 4, 2004, unless sooner terminated according to its terms or extended by exercise of any, or all, of the options contained in Clause H. 21 - Option to Extend the Term of the Contract (Month and Year TBD), and in Clause H.22 – Option, or otherwise extended in accordance with the appropriate FAR and DEAR provisions.

F.2 - FAR 52.242-15 - STOP WORK ORDER (AUG 1989) - ALTERNATE I (APR 1984)

(a) The Contracting Officer may, at any time, by written order to the Contractor, require the Contractor to stop all, or any part, of the work called for by this contract for a period of 90 days after the order is delivered to the Contractor, and for any further period to which the parties may agree. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Within a period of 90 days after a stop work is delivered to the Contractor, or within any extension of that period to which the parties shall have agreed, the Contracting Officer shall either --

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Termination clause of this contract.

(b) If a stop-work order issued under this clause is canceled or the period of the order or any extension thereof expires, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule, the estimated cost, the fee, or a combination thereof, and in any other terms of the contract that may be affected, and the contract shall be modified, in writing, accordingly, if --

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to the adjustment within 30 days after the end of the period of work stoppage; provided, that, if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon the claim submitted at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

F.3 - PRINCIPAL PLACE OF PERFORMANCE

The principal place of contract performance is at the site of Brookhaven National Laboratory, Upton, Suffolk County, New York.

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SECTION G - CONTRACT ADMINISTRATION DATA

G.1 - DOE CONTRACTING OFFICER

For the definition of Contracting Officer see Part II, Section I, Clause I.1 - FAR 52.202-1 - Definitions (DEC 2001); modified by DEAR 902.200 (DEC 2000) and DEAR 952.202-1 (MAR 2002), of this contract. The Contracting Officer is the only individual who has the authority on behalf of DOE to take the following actions under the contract:

(1) assign additional work within the general scope of the Statement of Work of the contract;

(2) issue a change as defined in the "Changes" clause of the contract;

(3) change any of the expressed terms, conditions or specifications of the contract;

(4) accept non-conforming work; or

(5) waive any requirement of this contract.

G.2 - RESERVED

G.3 - CONTRACT ADMINISTRATION

The contract will be administered by:

U.S. Department of Energy
Brookhaven Area Office
53 Bell Avenue, Bldg 464
Upton, New York 11973

Written communications regarding the contract shall be mailed to the above address except for correspondence regarding patent or intellectual property related matters which should be addressed to:

U.S. Department of Energy
Office of Chief Counsel - Intellectual Property
9800 South Cass Ave.
Argonne, Illinois 60439

Information copies of patent related correspondence should be sent to the Contracting Officer.

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SECTION H

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SPECIAL CONTRACT REQUIREMENTS

CLAUSE H.1 - LABORATORY FACILITIES

Laboratory Facilities. DOE agrees to continue to furnish and make available to the Contractor, for its possession and use in performing the work under this contract, the Laboratory facilities designated as follows:

(a) The Government-owned or leased land, buildings, utilities, equipment and other facilities situated at the Brookhaven National Laboratory Site at Upton, Suffolk County, New York; and

(b) Government-owned or leased facilities at such other locations as may be approved by DOE for use under this contract.

DOE reserves the right to make part of the above-mentioned land or facilities available to other Government agencies or other users on the basis that the responsibilities and undertakings of the Contractor will not be unreasonably interfered with. Before exercising its right to make any part of the land or facilities available to another agency or user, DOE will confer with the Contractor.

Subject to mutual agreement, other facilities may be used in the performance of the work under this contract.

CLAUSE H.2 - LONG-RANGE PLANNING, PROGRAM DEVELOPMENT AND BUDGETARY ADMINISTRATION

(a) Basic Considerations. Throughout the process of planning, and budget development and approval, the Parties recognize the desirability for close consultation, for advising each other of plans or developments on which subsequent action will be required, and for attempting to reach mutual understanding in advance of the time that action needs to be taken.

(b) Institutional Planning. It is the intent of the Parties to develop annually an Institutional Plan covering a five-year period. Development of the Institutional Plan is the strategic planning process by which the Parties, through mutual consultation, reach agreement on the general types and levels of activity which will be conducted at the Laboratory for the period covered by the plan. The Institutional Plan approved by DOE provides guidance to the Laboratory for long-range planning of programs, site and facility development, and for budget preparation. It also serves as a baseline for placement of work at the Laboratory.

(c) Work Authorization and Financing

(1) In accordance with the basic principles stated in paragraph (a) of this Clause, the Parties will utilize the procedures set forth in Part III, Attachment J.4, Appendix D, hereto attached and hereby made a part of this contract, for the development and presentation of work programs and budget estimates for the Laboratory and preliminary agreements thereon; such Appendix may be modified from time to time to the extent that the Parties so agree, in writing, without the execution of a formal supplement to this contract.

(2) DOE approval of the program proposals and budget estimates will be reflected in work authorizations and financial plans developed, issued and revised in accordance with the procedures agreed upon under subparagraph (c)(1) above.

CLAUSE H.3 - DEAR 970.70 AGREEMENTS TO PERFORM NON-DOE ACTIVITIES

(a) Subject to the prior written approval of the Contracting Officer, and in compliance with applicable requirements imposed by the Contracting Officer pursuant to Clause I.79 - Laws, Regulations, and DOE Directives, the Contractor may, through the Laboratory, perform non-DOE activities which are consistent with and complementary to the DOE's mission and the Laboratory's mission under the contract, involving the use of Laboratory equipment, facilities, or personnel. Such proposed work may be for non-Federal entities or other Federal agencies. The request for such approval shall set forth, in detail, the nature of the outside work to be performed, the Laboratory equipment, facilities or personnel required, and the financial and contractual arrangements proposed to pay for the cost of such work. The Contracting Officer shall consider such a request, being guided, among other factors, by the current or future needs of DOE's programs for the equipment, facilities, or personnel to be utilized in the performance of such outside work. Primary considerations in approving such work are that the proposed work will not place the Laboratory in direct competition with domestic non-Federal entities, will not adversely impact execution of the Laboratory's assigned programs, and will not create a potentially detrimental future burden on commitment of DOE resources. If the Contracting Officer approves such a request, the Contractor and DOE shall agree upon the terms and conditions which would apply to such work. This agreement may provide for receipt by the Government of all or part of such sum as represents the payment to be received by the Contractor for such outside work; provided, however, that DOE may contribute the use of certain equipment, facilities, or personnel to the Laboratory for the performance of such outside work if it determines that it desires to foster the activity in some measure. Except as otherwise approved by DOE, all clauses of this contract shall be deemed to be applicable to the performance of such work. This Clause shall not be construed as

amending or superseding the requirements of clause C.1, Statement of Work, set forth in Part I, Section C.

(b) The Contractor shall promptly advise the Contracting Officer of any advance notices of, or solicitations for, a major system acquisition requirement received from other Federal agencies pursuant to FAR 34.005 which would logically involve DOE facilities or resources operated or managed by the Contractor. The Contractor shall not respond to or otherwise propose to participate in response to the requirements of such solicitations unless the Contractor has obtained written approval of the Contracting Officer.

CLAUSE H.4 - COSTS ASSOCIATED WITH WHISTLEBLOWER ACTIONS

(a) Definitions.

(1) ADVERSE DETERMINATION means

(i) A recommended decision under 29 C.F.R. Part 24 by an Administrative Law Judge that the Contractor has violated the employee protection provisions of the statutes for which the Secretary of Labor has been assigned responsibility;

(ii) An initial agency decision under 10 C.F.R. 708.10 that the Contractor has engaged in conduct prohibited by 10 C.F.R. 708.5; and

(iii) A decision against the Contractor by the Secretary under 41 U.S.C. Section 265 (c)(1).

NOTE: In contracts with a non-standard paragraph (h) in the Insurance--Litigation and Claims clause, add the following subparagraph (iv):

(iv) A judgment or other determination of liability against the Contractor and in favor of the employee in an action in a judicial forum.

(2) COSTS include any costs or expenses relating to an employee action, as defined below, including but not limited to back pay, damages or other award in the form of relief to the employee; administrative and clerical expenses; the cost of legal services whether provided by the Contractor or procured from outside sources; the costs of services of accountants, consultants or other experts retained by the Contractor; all elements of related compensation, costs and expenses of employees, officers and directors; and any similar costs incurred after the commencement of the employee action.

(3) EMPLOYEE ACTION means an action brought by an employee of the Contractor under 29 C.F.R Part 24, 10 C.F.R. Part 708, or 41 U.S.C. Section 265, or an action filed in Federal or state court for redress of discrimination or discriminatory action by a Contractor based on activities that would be actionable under 29 CAR Part 24, 10 C.F.R. Part 708, or 41 U.S.C. Section 265.

(4) LITIGATION COSTS include attorney, consultant, and expert witness fees, but exclude the costs of settlement, judgment, or Secretarial Order.

(b) Segregation of Costs. All litigation costs incurred in the investigation and defense of an employee action under this clause shall be differentiated and accounted for by the Contractor so as to be separately identifiable. If the Contracting Officer provisionally disallows such costs, then the Contractor may not use funds advanced by DOE under the contract to finance the litigation.

(c) Allowability of Litigation and Other Costs.

(1) Litigation costs, including the use of alternative dispute resolution, and settlement costs incurred in connection with an employee action under this clause are allowable if the employee action is resolved prior to an adverse determination, provided such costs are otherwise allowable under the clauses entitled Insurance--Litigation and Claims and Cost Prohibitions Related to Legal and Other Proceedings, and other relevant provisions of this contract.

(2) In actions in which an adverse determination is issued, litigation, settlement, and judgment costs, as well as the cost of complying with any Secretarial Order, are not allowable, unless:

(i) the Contractor prevails in a proceeding subsequent to the adverse determination at which a final decision is rendered in the action;

(ii) the Contracting Officer has, on the basis that it is in the best interest of the Government, approved the Contractor's request to proceed with defense of an action rather than entering into a settlement with the employee or accepting an adverse determination or other interim decision prior to a final decision.

(3) Subsequent to an adverse determination, litigation costs, as well as costs associated with any interim relief granted, may not be paid from contract funds; provided, however, that the Contracting Officer may, in appropriate circumstances, provide for conditional payment from contract funds upon provision of adequate security, or other adequate assurance, and

agreements by the Contractor to repay all litigation costs, plus interest, if they are subsequently determined to be unallowable.

(4) Litigation costs incurred to defend an appeal by the employee from an interim or final decision in the Contractor's favor are allowable provided they are otherwise allowable under the clauses entitled Insurance--Litigation and Claims and Costs Prohibitions Related to Legal and Other Proceedings, and other relevant provision of the contract.

(d) The provisions of this clause shall not apply to the defense of suits by employees or ex-employees of the Contractor under Section 2 of the Major Fraud Act of 1988 as amended. (See the clause entitled Cost Prohibitions Related to Legal and Other Proceedings.)

CLAUSE H.5 – INTELLECTUAL AND SCIENTIFIC FREEDOM

(a) The Parties recognize the importance of fostering an atmosphere at the Laboratory conducive to scientific inquiry and the development of new knowledge and creative and innovative ideas related to important national interests.

(b) The Parties further recognize that the free exchange of ideas among scientists and engineers at the Laboratory and colleagues at universities, colleges, and other laboratories or scientific facilities is vital to the success of the scientific, engineering, and technical work performed by Laboratory personnel.

(c) In order to further the goals of the Laboratory and the national interest, it is agreed by the Parties that the scientific and engineering personnel at the Laboratory shall be accorded the rights of publication or other dissemination of research, and participation in open debate and in scientific, educational, or professional meetings or conferences, subject to the limitations included in technology transfer agreements and such other limitations as may be required by the terms of this contract. Nothing in this clause is intended to interfere with the obligations of the Parties to protect classified or other sensitive information as provided by law or reflected in Clause I.63 - DEAR 952.204-70 – CLASSIFICATION/ DECLASSIFICATION, of this contract.

CLAUSE H.6 – CARE OF LABORATORY ANIMALS

(a) Before undertaking performance of any contract involving the use of laboratory animals, the Contractor shall register with the Secretary of Agriculture of the United States in accordance with Section 6, Public Law 89-544, Laboratory Animal Welfare Act, August 24, 1966, as amended. The Contractor shall furnish evidence of such registration to the Contracting Officer.

(b) The Contractor shall acquire animals used in research and development programs from a dealer licensed by the Secretary of Agriculture, or from exempted sources in accordance with the Public Laws enumerated in paragraph (a) above.

(c) In the care of any animals used or intended for use in the performance of this contract, the Contractor shall comply with USDA regulations governing animal care and usage, as well as all other relevant local, State, and Federal regulations concerning animal care and usage. In addition, the Contractor will ensure that research will be conducted in a facility that either: (i) has a current National Institutes of Health (NIH) assurance number for animal care and usage, or (ii) is currently accredited for animal care and usage by an appropriate organization such as the American Association for Accreditation of Laboratory Animal Care, Inc. (AAALAC), or (iii) has a DOE Assurance Plan Number.

CLAUSE H.7 - PRIVACY ACT RECORDS

In accordance with the Privacy Act of 1974, 5 U.S.C. 552a (Public Law 93-579) and implementing DOE Regulations (10 CFR 1008), the Contractor shall maintain the following "Systems of Records" on individuals in order to accomplish the United States Department of Energy functions:

(a) "Personnel Medical Records" (DOE-33).

(b) "Personnel Radiation Exposure Records" (DOE-35) respecting Contractor employees, DOE employees, and visitors to the contract site.

(c) "Firearms Qualifications Records" (DOE-31) respecting laboratory guards authorized by DOE to carry firearms.

The parenthetical Department of Energy number designations for each system of records refers to the official "System of Records" number published by the United States Department of Energy in the Federal Register pursuant to the Privacy Act.

If DOE requires the Contractor to design, develop, or maintain additional systems of Government-owned records on individuals to accomplish an agency function in accordance with the Privacy Act of 1974 and 10 CFR 1008, the Contracting Officer, or designee, shall so notify the Contractor, in writing, and such Privacy Act system shall be deemed added to the above list whether incorporated by formal contract modification or not. The Parties shall mutually agree to a schedule for implementation of the Privacy Act with respect to each such system.

CLAUSE H.8 – COST AVOIDANCE AND REDUCTION PROGRAMS

(a) GENERAL

(1) The Contractor is encouraged to develop, prepare, and submit cost reductions and other practices and techniques to reduce or avoid costs. In addition to the Cost Reduction Program set forth below, the Contractor shall develop and submit to the Contracting Officer a Cost Mitigation Program which shall identify the Contractor's efforts in lowering the costs associated with performing the work under this contract. This program shall identify the Contractor's efforts at cost management, productivity increases, cost effectiveness and outsourcing.

(2) Cost Reduction. The Contractor is encouraged to develop, prepare, and submit Cost Reduction Proposals (CRPs) to the Contracting Officer for review. If accepted, the Contractor shall share in any net acquisition savings realized from accepted CRPs in accordance with the incentive sharing rate(s) in paragraph (f) below. No sharing will be authorized during any portion of any sharing period where the Contractor's performance is evaluated by DOE at less than good in any area where performance measures and criteria and/or annual appraisal review procedures are utilized to assess the Contractor's performance.

(b) DEFINITIONS. "Acquisition savings," as used in this clause, means savings resulting from the application of an accepted CRP to this contract. Acquisition savings include contract savings which are the net cost reductions on this, the instant contract, less the Contractor's allowable CRP development and implementation costs. Acquisition savings shall be limited, for purposes of the sharing rate(s) set forth in paragraph (f) below, to a period not to exceed 24 months. In order to qualify for sharing, savings must be susceptible to being deobligated from the instant contract, whether or not such deobligation takes place.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a CRP specifically in developing and testing the CRP, as well as those costs the Contractor incurs to make the changes necessary for DOE acceptance of a CRP.

"DOE costs," as used in this clause, means those DOE costs that result directly from implementing the CRP, such as any net increases in the cost of testing, operations, maintenance, and logistics support. The term does not include the normal administrative costs of processing the CRP.

"Cost reduction" means the amount of the decrease in cost of performance, without deducting any Contractor's development or implementation costs, resulting from using the CRP on this contract.

"Net acquisition savings" means total acquisition savings, less DOE costs.

"Sharing period," as used in this clause, means the period beginning with the recording of acquisition savings, as defined in this clause, and ending 24 months thereafter.

(c) Procedure for Submission of CRPs. Each CRP submitted by the Contractor shall include, as a minimum, the following information:

(1) A description of the existing requirement, of the proposed CRP requirements, and comparative advantages and disadvantages of each, and the effect of the proposed CRP on these requirements.

(2) A description of the changes that must be made if the proposed CRP is accepted, including changes or waivers to design requirements, regulatory requirements, DOE policy, or contract documents, etc.

(3) A separate, detailed cost estimate for the existing requirements and the proposed CRP. The estimate for the proposed CRP shall take into account the costs of implementing the CRP, including the costs DOE may incur in implementing the proposed CRP.

(4) A statement of the time by which acceptance of the proposed CRP must be issued in order to achieve the maximum cost reduction.

(5) The suggested sharing rate for the proposed CRP.

(6) Identification on any previous submissions of the CRP (or related CRPs), including the date(s) submitted, contract numbers involved, and result of proposal.

(d) Calculation of Estimated Net Savings. Estimated net savings shall be calculated by subtracting the total costs of the proposed CRP (to the Contractor and DOE) from the total costs of the existing requirements.

(e) Acceptance or Rejection of CRPs. The DOE will notify the Contractor, in writing, from the Contracting Officer that the CRP will be accepted or rejected. The only CRPs that will be considered for acceptance are those which the Contractor can demonstrate will (i) result in a reduction in the total agreed upon estimated cost for authorized work in the sharing period the savings from which are susceptable to deobligation from the contract, (ii) not re-appear as costs in subsequent periods,

(iii) not result in any degradation of essential functions, and (iv) be innovative in nature. Once accepted for consideration, the items to be agreed upon shall, as a minimum, include the estimated net savings of the change in requirements proposed by the CRP, the estimated reduction in the agreed upon estimated cost for the sharing period and the Contractor's share of such net savings. Any CRP may be accepted, in whole or in part, by the Contracting Officer's notice of acceptance, citing this clause. Until such a notice applies a CRP to this contract, the Contractor shall perform in accordance with the existing contract. The Contracting Officer's decision to accept or reject all or part of any CRP shall be final and not subject to the Disputes clause or otherwise subject to litigation under the Contract Disputes Act of 1978 (41 U.S.C. 601-613). If the CRP is rejected, the letter will set forth the reasons for rejection. If the Parties are unable to reach an agreement on acceptable terms, the CRP will be deemed to have been rejected. Until an agreement is reached, the Contractor shall perform in accordance with existing requirements. Negotiated agreements will be reflected in a Cost Reduction Proposal Implementation Agreement signed by both the Contractor and Contracting Officer.

(f) Sharing Rate. If a CRP is accepted, the Contractor's share in net acquisition savings shall not exceed 50% of the savings realized by DOE during the defined sharing period. The Contractor's share shall be used by the Contractor for scientific research, development and education consistent with the research and development mission and objectives of the Laboratory as set forth in Clause C.1. The Contractor may propose that the entire net acquisition savings be used by the Contractor for the performance of work in accordance with Clause C.1. The Contracting Officer may in his/her sole discretion determine to accept such a proposal in whole or part.

(g) Validation of Actual Savings. The DOE shall validate the actual costs of an accepted CRP to determine the extent of actual savings. If the actual savings are significantly more or less than the estimated savings of the CRP or in the reduction of the estimated cost for the sharing period, the amount awarded under the CRP shall be adjusted.

(h) Relationship to Other Incentives. Only those benefits of an accepted CRP not rewardable under other clauses of this contract shall be rewarded under this clause.

(i) Subcontracts. The Contractor may include an appropriate clause similar to this clause in any subcontract. In calculating any estimated net savings in a CRP under this contract, the Contractor's preparation, submission, testing, development and implementation costs shall include any subcontractor's allowable costs, and any CRP incentive payments to a subcontractor clearly resulting from the acceptance of such CRP. The Contractor may choose any arrangement for

subcontractor CRP incentive payments, provided that the payments shall not reduce the DOE's share of contract net savings.

(j) Disputes. Actions taken under this clause shall not be subject to the Disputes clause or otherwise subject to litigation under the Contract Disputes Act of 1978 (41 U.S.C. 601-613).

CLAUSE H.9 - DEAR 970.2210 SERVICE CONTRACT ACT OF 1965 (41 U.S.C. 351)

The Service Contract Act of 1965 is not applicable to this contract. However, in accordance with Clause I.114 - DEAR 970.5244-1 - CONTRACTOR PURCHASING SYSTEM (DEC 2000) (includes modifications in final rule dated 1/18/01) (Deviation), subcontracts awarded by the Contractor are subject to the Act to the same extent and under the same conditions as contracts awarded by DOE. The Contractor and the Contracting Officer shall develop a procedure whereby DOE will determine if the Service Contract Act is applicable to particular subcontracts.

CLAUSE H.10 - DEAR 970.2206 WALSH-HEALY PUBLIC CONTRACTS ACT

Except as otherwise may be approved, in writing, by the Contracting Officer, the Contractor agrees to insert the following provision in Purchase Orders and subcontracts under this contract. "If this contract is for the manufacture or furnishing of materials, supplies, articles, or equipment in an amount which exceeds or may exceed $10,000.00 and is otherwise subject to the Walsh-Healy Public Contracts Act, as amended (41 U.S. Code 35-45), there are hereby incorporated by reference all representations and stipulations required by said Act and regulations issued thereunder by the Secretary of Labor, such representations and stipulations being subject to all applicable rulings and interpretations of the Secretary of Labor which are now or may hereafter be in effect."

CLAUSE H.11 – PROTECTION OF HUMAN SUBJECTS

Before undertaking the performance of any research involving the use of human subjects, the provisions of 10 CFR 745, Federal Policy for the Protection of Human Subjects, must be complied with. This requirement applies to research undertaken with DOE support, work for others, and collaborations with other institutions.

CLAUSE H.12 – SOURCE AND SPECIAL NUCLEAR MATERIAL

The Contractor shall comply with all applicable regulations and instructions of DOE relative to the control of and accounting for source and special nuclear material (as these terms are defined in applicable regulations). The Contractor shall make such reports and

permit such inspections as DOE may require with reference to source and special nuclear materials. The Contractor shall take all reasonable steps and precautions to protect such materials against theft and misappropriations and to minimize all losses of such materials.

CLAUSE H.13 - PERFORMANCE MEASURE REVIEW

(a) In accordance with clause I.81A - TOTAL AVAILABLE FEE: BASE FEE AMOUNT AND PERFORMANCE FEE AMOUNT, the Parties agree to annually review the performance measures and self-assessment requirements contained in Part III, Attachment J.2, Appendix B and to modify them upon the agreement of the Parties; provided, however, that if the Parties cannot reach agreement on all the performance measures and self-assessment requirements for the next period, the Contracting Officer shall have the right to establish reasonable new performance measures and self-assessment requirements and/or to modify and/or delete existing performance measures and self-assessment requirements, subject to the provisions of paragraph (b) below. It is expected that the performance measures and self-assessment requirements will be modified by the Contractor and the DOE as new areas of emphasis or priorities emerge which the Parties may agree warrant recognition in the performance-based management system.

(b) In the event the Contracting Officer decides to exercise the right set forth in paragraph (a) above, he/she will notify the Contractor, in writing, of the intended decision and that a revision to Part III, Attachment J.2, Appendix B, containing the revised performance measures and/or self-assessment requirements will be issued to the Contractor within ten (10) working days.

CLAUSE H.14 - USE OF OBJECTIVE STANDARDS OF PERFORMANCE, SELF-ASSESSMENT AND PERFORMANCE EVALUATION

(a) The Parties agree that the Contractor will utilize a performance-based management system for Laboratory oversight. The performance-based management system will include the use of clear and reasonable performance measures agreed to, in advance, as standards against which the Contractor's overall performance of scientific, technical, operational, and/or managerial obligations under this contract will be assessed.

(b) In accordance with paragraph (f) of clause I.81A - TOTAL AVAILABLE FEE: BASE FEE AMOUNT AND PERFORMANCE FEE AMOUNT and Part III, Section J.2, Appendix B, the Contractor will conduct an on-going self-assessment process, including self-assessments performed at the Laboratory, as the principal means by which the Contractor will evaluate its compliance with the performance measures which are contained in Part III, Attachment J.2, Appendix B, attached hereto and made a part hereof.

(c) Further, the Parties agree to utilize a process described in clause I.81A - TOTAL AVAILABLE FEE: BASE FEE AMOUNT AND PERFORMANCE FEE AMOUNT and Appendix B to evaluate the performance of the Laboratory. The Parties further agree that the evaluation process, described in Part III, Attachment J.2, Appendix B, will be reviewed annually and modified, if necessary, by agreement of the Parties.

(d) Annually, the Contracting Officer shall provide a written assessment of the Contractor's performance hereunder to the Contractor which shall be based upon the terms and conditions of this Contract including the evaluation process described in Part III, Attachment J.2, Appendix B, and the Contracting Officer's evaluation of the Contractor's self-assessment.

(e) The Contractor agrees to comply with direction or respond with corrective action resulting from performance deficiencies identified as part of DOE's evaluation of demonstrated performance against the criteria and measurements contained in Part III, Section J.2, Appendix B.

CLAUSE H.15 - CAP ON LIABILITY

(a) The Parties have agreed that the Contractor's liability for certain obligations it has assumed under this contract shall be limited as set forth in paragraph (b) below. These limitations or caps shall only apply to obligations the Contractor has assumed pursuant to:

(1) Clause I.98 (h)(3);

(2) Clause I.98 (j)(2), except for punitive damages resulting from the willful misconduct, or lack of good faith of the Contractor's managerial personnel as defined in Clause I.115 (j);

(3) Clause H.4; and

(4) Clause I.115 (f)(1)(i)(C).

These obligations shall apply on a cumulative basis for each Fiscal Year for the performance periods as specified in Clause I.80A (b). The annual cap which will apply shall be based on the Fiscal Year in which the Contractor's act or failure to act was the proximate cause of the liability assumed by the Contractor pursuant to the provisions of the Clauses identified above. Provided, further, that in the event the Contractor's act or failure to act overlaps more than one period, then the applicable cap will be the cap for the last period in which the Contractor's act or failure to act occurred.

(b) The liability cap shall be negotiated for each Fiscal Year. For the period beginning after completion of the transition period through September 30, 1998, the cap shall be as set forth in (c) below. Except as otherwise provided in paragraph (a) above, and notwithstanding any other provision of this contract to the contrary, if the liability cap is reached for any year, the Contractor shall have no further responsibility for the costs of the liabilities it has assumed pursuant to (a)(1) through (4) above, and all costs in excess of the liability cap for said liabilities shall be borne by the Government.

(c) For the period beginning after completion of the transition period through September 30, 1998, the Contractor will be responsible for the first $500,000 of these liabilities and the next $10,000,000 will be shared by the Contractor and the Government on a fifty-fifty per dollar basis. Accordingly, the total cap shall be $10,500,000 and the Contractor's share of said total cap shall be $5,500,000.

(d) The amount of the cap and other limitations for any period beyond September 30, 1998, will be negotiated along with the fee in accordance with Clause I.80A (b). Pending negotiation of any cap and fee, the liability cap will remain the same as for the previous period.

CLAUSE H.16 - CONTRACTOR FUNDED TECHNOLOGY TRANSFER PROGRAM

The Government and Contractor shall negotiate in good faith the terms and conditions of a Contractor funded technology transfer program. A publicly funded technology transfer program shall be used exclusively until a Contractor funded technology transfer program is mutually agreed to. It is currently anticipated by the parties that negotiations shall be guided by the following principles:

(1) Contractor may utilize both Government and Contractor private funds to operate its technology transfer program;

(2) Contractor will pursue its privately funded technology transfer program using the principles of U.S. Competitiveness, Fairness of Opportunity and other principles consistent with the publicly funded technology transfer program;

(3) Contractor may acquire an ownership interest in an entity in lieu of (or in addition to) continuing royalties pursuant to an equity plan developed by the Contractor, and such equity shall be administered in the same manner as royalties;

(4) Licensing and commercialization of software ordinarily will be conducted under the publicly funded technology transfer program. However, in cases where the Contractor demonstrates special circumstances exist or significant benefit to the Government and the Laboratory, the Government may approve commercialization under a privately funded technology transfer program;

(5) Net income from the conduct of Contractor funded technology transfer will be allocated by Contractor as follows:

(i) 51% of such net income shall be used by Contractor at the Laboratory in support of scientific research, development and education consistent with the research and development mission and objectives of the Laboratory; and

(ii) 49% of such net income may be used by the Contractor at a location other than the Laboratory so long as such use is for scientific research, development and education consistent with the research and development mission and objectives of the Laboratory. Net income is defined as that amount remaining after the expense of patenting costs, licensing costs, payments to inventors, and other expenses incidental to the administration of Subject Inventions is deducted from gross income received. Net income shall be determined on a program basis (not on a technology-by-technology basis) each fiscal year, without carry-over from previous years.

(6) Upon termination or expiration of this contract, Contractor and Government shall enter into good faith negotiations prior to such termination or expiration to determine the respective rights of the parties and the disposition of title to privately funded Subject Inventions, licenses, royalties, or equity generated therefrom. Such negotiations will include recognition of the long-term research and development mission and objectives of the Laboratory as well as private investments made by the Contractor with respect to such privately funded Subject Inventions.

(7) The Contractor shall indicate whether a subject invention will be pursued under the publicly funded or the privately funded technology transfer program at the time the Subject Invention is reported to the DOE, unless otherwise agreed in writing by Patent Counsel on a case-by-case basis.

CLAUSE H.17 - NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS - SENSE OF CONGRESS

It is the sense of the Congress that, to the greatest extent practicable, all equipment and products purchased with funds made available under this award should be American-made.

CLAUSE H.18 - RESERVED

CLAUSE H.19 - RESERVED

CLAUSE H.20 - EXTERNAL REGULATION

The Parties commit to full cooperation with regard to complying with any statutory mandate regarding external regulation of Laboratory facilities, whether by the Nuclear Regulatory Commission, the Occupational Safety and Health Administration, and/or State and local entities with regulatory oversight authority, and including but not limited to the conduct of pilot programs simulating external regulation, and the application for materials, facilities, or other licenses by or on behalf of the DOE.

CLAUSE H.21 - OPTION TO EXTEND THE TERM OF THE CONTRACT (Month and Year TBD)

(a) The Department of Energy may unilaterally extend the term of this performance-based management contract by written notice to the Contractor within ninety (90) days prior to the expiration of the contract; provided, that the Department of Energy shall give the contractor a preliminary written notice of its intent to extend at least twelve (12) months before the basic term of the contract expires. The preliminary notice does not commit the Department of Energy to an extension.

(b) The option(s) to extend the contract is identified in Clause H.22, Option, of the contract. The Department of Energy may exercise any, or all, of the options identified in the contract. The total duration of this contract, including the exercise of any option(s) under this clause, shall not exceed 120 months.

CLAUSE H.22 – OPTION

DOE, at its sole discretion, has the option to extend this contract for an additional five years. Said option may be exercised in any combination of increments of at least one year in duration. The decision whether or not to exercise the option will occur after an evaluation of Contractor performance of all work under this contract and the requirements of applicable statutes and regulations.

CLAUSE H.23 - INCORPORATION OF REVISED DEPARTMENTAL POLICIES AND PROCEDURES

The Parties acknowledge that DOE has undertaken a review of DOE policies and procedures applicable to contracts for management and operation of Government-owned facilities. This review may result in further additions, deletions or revisions to existing contract clauses or other DOE regulations which are issued after the effective date of this Modification, and which could conflict with or supersede some aspects of this

Modification. It is the intent of the Parties to negotiate in good faith to reach mutual agreement to incorporate such new or revised clauses or regulations, as appropriate.

CLAUSE H.24 - GUARANTEE OF PERFORMANCE

In view of the fact that the Contractor has been organized by Battelle Memorial Institute and The Research Foundation of State University of New York (BMI) and (RFSUNY) for the sole purpose of performing the work hereunder, and in view of the fact that BMI and RFSUNY are the sole members of the Contractor, this contract shall be subject to the execution of guarantees of performance by both BMI and RFSUNY in such form as shall be satisfactory to DOE, and this contract shall not be binding unless such guarantee is duly executed.

CLAUSE H.25 – ADVANCE UNDERSTANDINGS

(a) Pursuant to Clause I.11 – FAR 52.211-5 - Material Requirements (AUG 2000), the Contractor is authorized to obtain Government surplus property in accordance with its DOE approved Supply and Materiel Group Standard Operating Procedures manual and to obtain and use used, reconditioned, or remanufactured supplies when it determines it is in accordance with and benefits the work to be performed under the contract.

(b) Pursuant to subparagraph (d)(2) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), similar items of allowable communication costs include delivery fees and the operational costs for the facilities and equipment necessary to operate communication equipment including telephone, facsimile and teletype, radiogram, electronic mail, video conferencing and cellular phone.

(c) Pursuant to subparagraph (d)(11) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), the Contractor is authorized to continue existing subscriptions and add to the existing list consistent with providing a benefit to the work being performed under the contract as approved by the Assistant Laboratory Director for Finance and Administration. This authorization is subject to receipt, by November 30th of each year, of the current fiscal year's listing of subscriptions and their costs, which were purchased with DOE funds.

(d) Pursuant to subparagraph (d)(15) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), DOE and the Contractor have agreed on the following Brookhaven National Laboratory (BNL) Fiscal Office Cashier's policy regarding the cashing of personal checks:

Drafts for BNL payroll, travel advances, travel expense reimbursement, and honoraria/stipends drawn on the Chase Manhattan Bank (or other contracted DOE Special Financial Institution), are honored by the Teacher's Federal Credit Union at the on site branch office for anyone presenting an employee or guest identification card. Therefore, the BNL Cashier will cash such drafts only during such hours that the Credit Union is not open for business. These instances will include, for example, but not necessarily be limited to, the cashing of drafts for BNL shift workers.

Visitors and guests of the Laboratory can cash personal checks at the BNL Cashier, if they are drawn on financial institutions other than Teachers Federal Credit Union, up to a single check maximum limit of $200. In certain unusual circumstances, at the discretion and with the approval of the Laboratory Fiscal Officer or Assistant Fiscal Officer, personal checks of employees as well as checks in excess of $200, as required by the circumstances, may be cashed by the BNL Cashier.

Such instances of check cashing for employees, visitors and guests shall be performed at no cost to those persons, and the incidental operating costs related thereto shall be deemed allowable costs under the contract.

(e) Subparagraph (d)(16) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), cites as an example of allowable costs, litigation expenses necessary to defend any member of the Contractor's guard force against whom a civil or criminal action is brought, where such action is based upon lawful act or acts of the guard undertaken in the general course of his duties for the purpose of accomplishing and fulfilling the official duties of his employment. Since these costs are allowable only if incurred in accordance with Clause I.98 – DEAR 970.5228-1 - Insurance –Litigation and Claims (DEC 2000)(DEVIATION)(includes Modifications in final rule dated January 18, 2001 and in final rule dated March 28, 2002), and approved or ratified by the Contracting Officer, DOE and the Contractor have agreed to the following in connection with the interpretation and administration of this provision:

Any request for approval/ratification must include a determination by the Contractor that (i) the guard's action giving rise to the civil or criminal action reasonably appear to have been performed within the scope of his/her employment, and (ii) that it is in the best interests of the Laboratory to pay for the guard's litigation expenses. DOE and the Contractor further agree that in interpreting the term "lawful", due consideration shall be given to whether a member of the Contractor's internal guard force acted in good faith and reasonably believed such action to be in the general scope of his or her employment to accomplish official duties and, in addition, in criminal actions, had no reasonable cause to believe that his or her conduct was unlawful. The termination of any civil

action or proceeding by judgment or settlement shall not in itself create a presumption that any such guard did not act in good faith for a purpose which he or she reasonably believed to be within his or her scope of employment and official duties. The termination of any criminal action or proceeding by conviction or upon a plea of nolo contendere, or its equivalent, shall create a rebuttable presumption that such guard did not have reasonable cause to believe that his or her conduct was lawful.

Finally, in connection with any federal criminal proceeding against a member of the Contractor's internal guard force, the Contractor recognizes that Contracting Officer approval of the allowability of litigation expenses will be further predicated on the Contracting Officer determining that such reimbursement is in the best interests of the United States.

(f) Pursuant to subparagraph (e)(5) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), the Contractor may use space at Brookhaven National Laboratory, rent free, for the maintenance of a corporate office. The cost of normal support for the office, including, without limitation, furniture, equipment, supplies, maintenance, custodial services, utilities, accounting, procurement, fiscal, and other support services shall be deemed allowable costs under the contract. Nothing herein shall be construed as making a cost specifically unallowable under any other terms of this contract allowable. Furthermore, should it appear that there will be a substantial increase in the space required for the corporate office, or in the expense of the support functions as described above, the Contractor will bring such increase to the attention of DOE and the matter will be subject to reexamination by DOE and the Contractor. Furthermore, the allocation of the cost of Contractor corporate staff for travel expenditures directly incurred for work performed under the contract, shall be allowable costs under subparagraph (e)(25) of Clause I.80A of the contract.

(g) Pursuant to subparagraph (e)(19) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), the Contractor is authorized to continue memberships and may register memberships in other comparable trade, business, technical, and professional organizations as the need arises and as approved by the Assistant Laboratory Director for Finance and Administration in accordance with the Laboratory's Membership Approval Process. This authorization is subject to the Contractor providing to the Contracting Officer by November 30th of each year, a listing of the current fiscal year's memberships, and associated costs, for each of the aforementioned organizations.

(h) Pursuant to subparagraph (e)(26) of Clause I.80A – DEAR 970.5204-13 – Allowable Costs and Fees (Management and Operating Contracts)(JUN 1997), no payment made by the Contractor to any individual employed under this contract as a consultant or in another comparable capacity, shall be an unallowable cost

pursuant to said paragraph (e)(26), provided the individual receiving said payment has represented in writing to the Contractor that he or she is not an employee of another organization and concurrently performing work for that organization on a full-time basis under a cost-type contract with DOE.

(i) Pursuant to Clause I.81 – DEAR 970.5208-1 – Printing (DEC 2000), the Contractor is authorized to certify, prior to the printing of individual jobs, that the use of more than one color of ink fulfills a specific functional need in accordance with the guidance provided in the Government Printing and Binding Regulations, Title 44 of the U.S. Code and DOE directives related thereto. This authorization is subject to the Contractor providing to the Contracting Officer, on an annual basis, a report on all multicolor printing activities supported with DOE funds.

(j) Pursuant to Clause I.107 – DEAR 970.5232-7 – Financial Management System (DEC 2000), the financial management system covered in Clause I.107 includes the Laboratory's current existing integrated accounting system which consists of the following subsystems: budget, payroll, labor cost distribution, accounts receivable, accounts payable, procurement, receiving, inventory, project costing, general ledger, and the financial aspects of the capital equipment and fixed assets system, as well as such other subsystems as may be agreed to by DOE and the Contractor. In accordance with the specified annual plan, only those subsystems and/or major enhancements and/or upgrades exceeding $250,000.00 require approval by DOE.

CLAUSE H.26 – TRANSFER OF RESPONSIBILITY

(a) Assumption of Responsibility for BNL

The Contracting Officer has determined that the Contractor has completed Transition Activities, exclusive of items the parties have mutually agreed to accomplish post-transition, therefore effective as of 12:01 a.m. on March 1, 1998, Contractor will assume full responsibility for Brookhaven National Laboratory (BNL). Contractor shall commence the scope of work in accordance with all of the provisions of the contract and the Transfer Agreement.

(b) Assignment of Rights

Pursuant to the Transfer Agreement executed between DOE, Contractor and Associated Universities, Inc., effective February 28, 1998, certain of AUI's rights, title and interest to and in certain agreements, licenses, permits and other commitments were assigned to Contractor. Contractor shall complete all reasonable administrative and other actions necessary and required to effect the transfers set forth in the Transfer Agreement for the following items:

(1) purchase orders, subcontracts, Cooperative Research and Development Agreements and other agreements referred to in Paragraph 4 of the Transfer Agreement;

(2) collective bargaining agreements referred to in Paragraph 5 of the Transfer Agreement;

(3) intellectual property and software licenses referred to in Paragraph 6 of the Transfer Agreement;

(4) environmental permits and licenses referred to in Paragraph 10 of the Transfer Agreement;

(5) retirement and comprehensive welfare benefits plans referred to in Paragraph 13 of the Transfer Agreement; and

(6) financial and administrative commitments referred to in Paragraph 11 of the Transfer Agreement.

DOE agrees that Contractor can administer and act with respect to the above documents, agreements and activities under the terms of the assigned documents or agreements and may, but is not required to, make modifications thereto in order to achieve conformance with the terms and conditions of this contract. DOE acknowledges that the terms, conditions, requirements and commitments of the assigned instruments may not be consistent with the terms and conditions of this contract, and Contractor may, as it deems appropriate, make such conforming modifications without further DOE approval.

(c) Costs

DOE and Contractor agree that costs and expenses incurred with respect to the items set forth in paragraph (b), above, that arise as a result of acts or failures to act prior to March 1, 1998 (including legally required filings or submittals to government agencies), or compliance with the terms and conditions of assigned agreements, shall be allowable and reimbursed by DOE notwithstanding any restriction or limitation in this contract, provided, however, that such costs shall not be reimbursed if they are caused as a result of the lack of good faith or willful misconduct or the failure to exercise prudent business judgment on the part of Contractor's managerial personnel subsequent to assignment. DOE's obligation is subject to the availability of appropriated funds.

(d) Government Property

Contractor assumes the care, custody and control of all of the items of Government-owned personal property listed in AUI's inventory as of the Transfer

Date, and shall be responsible to account to DOE for all such property, notwithstanding any discrepancy which may result from any inventory that may be conducted by Contractor in the future. Contractor assumes the care, custody and control of all Government-owned real property identified in the Transfer Agreement. Contractor shall not be liable for any damage or condition respecting personal or real property which may be a pre-existing condition in accordance with the terms of Clause I.100 of this contract, "Preexisting Conditions".

(e) Close-out Assistance

The Contractor shall provide assistance in closing out the AUI contract, including but not limited to the following items and services upon request and approval of the Contracting Officer:

(1) Office space on the site suitable to accommodate three people, and necessary Government-owned property including, but not limited to office furniture, computers, photocopiers, telecommunications including facsimile service, office supplies and similar items.

(2) Clerical and secretarial support to support close-out activities.

(3) Emergency services, utilities, and housekeeping services.

(4) Subject to any DOE restrictions, for purposes of all close-out activities including litigation, claims and administrative hearings arising under the AUI contract on the Transfer Date or thereafter, Contractor shall provide reasonable access to data, documents and records transferred in the Transfer Agreement that are necessary to close-out activities, and reasonable access to Laboratory employees. Access shall be on a non-interference basis and Contractor agrees to use its best efforts to accommodate any request of AUI made with the advance notice described in the Transfer Agreement.

(5) Subject to all security and safety laws, rules and regulations and internal DOE Orders or Directives applicable to the site, Contractor shall provide access to the site as is reasonable and necessary for close-out activities, including prosecution and defense of any litigation, claim, or hearings. Contractor shall immediately notify the Contracting Officer in the event requested access is to be denied, and shall comply with the final decision of the Contracting Officer respecting access, which final decision shall not be subject to the Disputes clause of this contract.

PART II

SECTION I

CONTRACT CLAUSES

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Contract Clauses

CLAUSE I.1 - FAR 52.202-1 DEFINITIONS (DEC 2001); MODIFIED BY DEAR 902.200 (DEC 2000) AND DEAR 952.202-1 (MAR 2002)

(a) *Head of Agency* means: (i) The Secretary; (ii) Deputy Secretary; (iii) Under Secretaries of the Department of Energy and (iiii) the Chairman, Federal Energy Regulatory Commission.

(b) "Commercial component" means any component that is a commercial item.

(c) "Commercial item" means --

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and that --

(i) Has been sold, leased, or licensed to the general public; or

(ii) Has been offered for sale, lease, or license to the general public;

(2) Any item that evolved from an item described in paragraph (c)(1) of this clause through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

(3) Any item that would satisfy a criterion expressed in paragraphs (c)(1) or (c)(2) of this clause, but for --

(i) Modifications of a type customarily available in the commercial marketplace; or

(ii) Minor modifications of a type not customarily available in the commercial marketplace made to meet Federal Government requirements. "Minor" modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

(4) Any combination of items meeting the requirements of paragraphs (c)(1), (2), (3), or (5) of this clause that are of a type customarily combined and sold in combination to the general public;

(5) Installation services, maintenance services, repair services, training services, and other services if --

(i) Such services are procured for support of an item referred to in paragraph (c)(1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government

(6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed. For purposes of these services --

(i) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) "Market prices" means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

(7) Any item, combination of items, or service referred to in paragraphs (c)(1) through (c)(6), notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a Contractor; or

(8) A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local Governments.

(d) "Component" means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) "Contracting Officer" means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) "Nondevelopmental item" means --

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(g) Except as otherwise provided in this contract, the term "subcontracts" includes, but is not limited to, purchase orders and changes and modifications to purchase orders under this contract.

(h) The term DOE means the Department of Energy, FERC means the Federal Energy Regulatory Commission, and NNSA means the National Nuclear Security Administration.

(i) The term Senior Procurement Executive means, for DOE: Department of Energy - Director, Office of Procurement and Assistance Management, DOE; National Nuclear Security Administration – Administrator for Nuclear Security, NNSA; and Federal Energy Regulatory Commission – Chairman, FERC.

(j) "Contractor" means "Brookhaven Science Associates, LLC".

(k) "Laboratory" means the BROOKHAVEN NATIONAL LABORATORY (BNL) composed of Government-owned buildings and facilities together with the necessary utilities, now existing or hereafter to be acquired, constructed and equipped, most of which are or will be situated on a plot or plots of land (hereinafter referred to as the "Laboratory Site") at Upton, Suffolk County, New York.

(l) The term "someone acting as the Laboratory Director" means the person appointed as Laboratory Director or a person specified, in writing, to have authority to act in the absence of the Laboratory Director, or if the selected offeror has a Deputy Laboratory Director(s), the term "someone acting as the Laboratory Director" means the person appointed as Laboratory Director, the Deputy Laboratory Director(s) acting in the absence of the Laboratory Director, or a person specified, in writing, to have authority to act in the absence of the Laboratory Director and Deputy Laboratory Director(s).

(m) The term "DOE Directive" means DOE Orders and Notices, Modifications thereto, and other forms of directives, including for purposes of this contract those portions of DOE's Accounting and Procedures Handbook applicable to integrated Contractors, issued by DOE. The term does not include temporary written instructions by the Contracting Officer for the purpose of addressing short-term or urgent DOE concerns relating to health, safety, or the environment.

CLAUSE I.2 - FAR 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative:

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

(2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

(b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.

(c) If this contract is terminated under paragraph (a) above, the Government is entitled:

(1) To pursue the same remedies as in a breach of the contract; and

(2) In addition to any other damages provided by law, to exemplary damages of not less than three (3) nor more than ten (10) times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)

(d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

CLAUSE I.3 - FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of the contingent fee.

(b) "Bona fide agency", as used in this clause, means an established commercial or selling agency, maintained by a Contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee", as used in this clause, means a person, employed by a Contractor and subject to the Contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee", as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence", as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

(c) Subcontracts and Purchase Orders. Unless otherwise authorized by the Contracting Officer, in writing, the Contractor shall cause provisions similar to the foregoing to be inserted in all subcontracts and purchase orders entered into under this contract.

CLAUSE I.4 - FAR 52.203-6 RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT (JUL 1995)

(a) Except as provided in paragraph (b) below, the Contractor shall not enter into any agreement with an actual or prospective subcontractor, nor otherwise act in any manner, which has or may have the effect of restricting sales by such subcontractors directly to the Government of any item or process (including computer software) made or furnished by the subcontractor under this contract or under any follow-on production contract.

(b) The prohibition in paragraph (a) above does not preclude the Contractor from asserting rights that are otherwise authorized by law or regulation.

(c) The Contractor agrees to incorporate the substance of this Clause, including this paragraph (c), in all subcontracts under this contract which exceed $100,000.

CLAUSE I.5 - FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)

(a) Definitions.

(1) "Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract.

(2) "Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

(3) "Prime Contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

(4) "Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

(5) "Prime Contractor Employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

(6) "Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose

of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

(7) "Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher-tier subcontractor.

(8) "Subcontractor Employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from --

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher-tier subcontractor.

(c) (1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report, in writing, the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may (i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or (ii) direct that the prime Contractor withhold from sums owed a subcontractor under the prime contract, the amount of the kickback. The Contracting Officer may order that monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has

already offset those monies under subdivision (c)(4)(i) of this Clause. In either case, the prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract.

CLAUSE I.6 - FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) If the Government receives information that a Contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by Section 4304 of the National Defense Authorization Act for Fiscal Year 1996 (Pub.L. 104-106), the Government may --

(1) Cancel the solicitation, if the contract has not yet been awarded or issued; or

(2) Rescind the contract with respect to which --

(i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either --

(A) Exchanging the information covered by such subsections for anything of value; or

(B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or

(ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsection 27 (e)(1) of the Act.

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

CLAUSE I.7 - FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract by the amount of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of Subsection 27(a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in Section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be --

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award fee contracts --

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may --

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract

at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime Contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

CLAUSE I.8 - FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)

(a) Definitions

"Agency," as used in this Clause, means executive agency as defined in 2.101. "Covered Federal action," as used in this Clause, means any of the following Federal actions:

(1) The awarding of any Federal contract.

(2) The making of any Federal grant.

(3) The making of any Federal loan.

(4) The entering into of any cooperative agreement.

(5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in Section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer

or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

(1) An individual who is appointed to a position in the Government under Title 5, United States Code, including a position under a temporary appointment.

(2) A member of the uniformed services, as defined in Subsection 101(3), Title 37, United States Code.

(3) A special Government employee, as defined in Section 202, Title 18, United States Code.

(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, Title 5, United States Code, Appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor, and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within one (1) year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within one (1) year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of Title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing, or attempting to influence, an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action --

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of -

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or

analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(c) Disclosure.

(1) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB Standard Form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(2) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes --

(i) A cumulative increase of $25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(ii) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(iii) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(3) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding $100,000 under the Federal contract.

(4) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(d) Agreement. The Contractor agrees not to make any payment prohibited by this Clause.

(e) Penalties.

(1) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(2) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(f) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

CLAUSE I.9 - FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause --

"Postconsumer material" means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of "recovered material." For paper and paper products, postconsumer material means "postconsumer fiber" defined by the U.S. Environmental Protection Agency (EPA) as --

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

"Printed or copied double-sided" means printing or reproducing a document so that information is on both sides of a sheet of paper.

"Recovered material," for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as "recovered fiber" and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as --

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

CLAUSE I.9A - FAR 52.208-8 REQUIRED SOURCES FOR HELIUM AND HELIUM USAGE DATA (APR 2002)

(a) Definitions.

"Bureau of Land Management," as used in this clause, means the Department of the Interior, Bureau of Land Management, Amarillo Field Office, Helium Operations, located at 801 South Fillmore Street, Suite 500, Amarillo, TX 79101-3545.

"Federal helium supplier" means a private helium vendor that has an in-kind crude helium sales contract with the Bureau of Land Management (BLM) and that is on the BLM Amarillo Field Office's Authorized List of Federal Helium Suppliers available via the Internet at http://www.nm.blm.gov/www/amfo/amfo_home.html.

"Major helium requirement" means an estimated refined helium requirement greater than 200,000 standard cubic feet (scf) (measured at 14.7 pounds per square inch absolute pressure and 70 degrees Fahrenheit temperature) of gaseous helium or 7510 liters of liquid helium delivered to a helium use location per year.

(b) *Requirements.*

(1) Contractors must purchase major helium requirements from Federal helium suppliers, to the extent that supplies are available.

(2) The Contractor shall provide to the Contracting Officer the following data within 10 days after the Contractor or subcontractor receives a delivery of helium from a Federal helium supplier-

(i) The name of the supplier;

(ii) The amount of helium purchased;

(iii) The delivery date(s); and

(iv) The location where the helium was used.

(c) *Subcontracts.* The Contractor shall insert this clause, including this paragraph (c), in any subcontract or order that involves a major helium requirement.

CLAUSE I.10 - FAR 52.209-6 PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

(a) The Government suspends or debars Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of $25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.

(b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed $25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principals, is or is not debarred, suspended, or proposed for debarment by the Federal Government.

(c) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs). The notice must include the following:

(1) The name of the subcontractor.

(2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs.

(3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

(4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension or proposed debarment.

CLAUSE I.11 - FAR 52.211-5 MATERIAL REQUIREMENTS (AUG 2000)

(a) Definitions.

As used in this clause --

"New" means composed of previously unused components, whether manufactured from virgin material, recovered material in the form of raw material, or materials and by-products generated from, and reused within, an original manufacturing process; provided that the supplies meet contract requirements, including but not limited to, performance, reliability, and life expectancy.

"Reconditioned" means restored to the original normal operating condition by readjustments and material replacement.

"Recovered material" means waste materials and by-products recovered or diverted from solid waste, but the term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

"Remanufactured" means factory rebuilt to original specifications.

"Virgin material" means --

(1) Previously unused raw material, including previously unused copper, aluminum, lead, zinc, iron, other metal or metal ore; or

(2) Any undeveloped resource that is, or with new technology will become, a source of raw materials.

(b) Unless this contract otherwise requires virgin material or supplies composed of or manufactured from virgin material, the Contractor shall provide supplies that are new, reconditioned, or remanufactured, as defined in this clause.

(c) A proposal to provide unused former Government surplus property shall include a complete description of the material, the quantity, the name of the Government agency from which acquired, and the date of acquisition.

(d) A proposal to provide used, reconditioned, or remanufactured supplies shall include a detailed description of such supplies and shall be submitted to the Contracting Officer for approval.

(e) Used, reconditioned, or remanufactured supplies, or unused former Government surplus property, may be used in contract performance if the Contractor has proposed the use of such supplies, and the Contracting Officer has authorized their use.

CLAUSE I.12 - FAR 52.215-8 ORDER OF PRECEDENCE - UNIFORM CONTRACT FORMAT (OCT 1997)

Any inconsistency in this solicitation or contract shall be resolved by giving precedence in the following order:

(a) The Schedule (excluding the specifications).

(b) Representations and other instructions.

(c) Contract clauses.

(d) Other documents, exhibits, and attachments.

(e) The specifications.

CLAUSE I.13 - FAR 52.215-12 SUBCONTRACTOR COST OR PRICING DATA (OCT 1997)

(a) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1 applies.

(b) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (a) of this clause were accurate, complete, and

current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(c) In each subcontract that exceeds the threshold for submission of cost or pricing data at FAR 15.403-4, when entered into, the Contractor shall insert either --

(1) The substance of this clause, including this paragraph (c), if paragraph (a) of this clause requires submission of cost or pricing data for the subcontract; or

(2) The substance of the clause at FAR 52.215-13, Subcontractor Cost or Pricing Data--Modifications.

CLAUSE I.14 - FAR 52.215-13 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS (OCT 1997)

(a) The requirements of paragraphs (b) and (c) of this clause shall --

(1) Become operative only for any modification to this contract involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4; and

(2) Be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving a pricing adjustment expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1 applies.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (b) of this clause were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that exceeds the threshold for submission of cost or pricing data at FAR 15.403-4 on the date of agreement on price or the date of award, whichever is later.

CLAUSE I.15 - FAR 52. 219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

(c) Definitions. As used in this contract --

"HUBZone small business concern" means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

"Service-disabled veteran-owned small business concern" --

(1) Means a small business concern--

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16). "Small business concern" means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

"Small disadvantaged business concern" means a small business concern that represents, as part of its offer that --

(1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, Subpart B;

(2) No material change in disadvantaged ownership and control has occurred since its certification;

(3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed $750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

"Veteran-owned small business concern" means a small business concern --

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned small business concern" means a small business concern --

(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-

owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

CLAUSE I.16 - FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (JAN 2002)

(a) This clause does not apply to small business concerns.

(b) *Definitions.* As used in this clause -

"Commercial item" means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

"Commercial plan" means a subcontracting plan (including goals) that covers the offeror's fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

"Individual contract plan" means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

"Master plan" means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

"Subcontract" means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in

and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of -

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to -

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRO-Net as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with-

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of $500,000 ($1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will-

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small

business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than $100,000, indicating-

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact-

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through -

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided-

(1) The master plan has been approved;

(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) The failure of the Contractor or subcontractor to comply in good faith with-

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts.* This report shall be submitted to the Contracting Officer semiannually and at

contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report.* This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

CLAUSE I.17 - FAR 52.219-16 LIQUIDATED DAMAGES - SUBCONTRACTING PLAN (JAN 1999)

(a) "Failure to make a good faith effort to comply with the subcontracting plan," as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled "Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan. If, at contract completion, or in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled, "Small Business Subcontracting Plan", the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the

Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by the commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled, Disputes, from any final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

CLAUSE I.18 - FAR 52.219-25 SMALL DISADVANTAGED BUSINESS PARTICIPATION PROGRAM-DISADVANTAGED STATUS AND REPORTING (OCT 1999)

(a) *Disadvantaged status for joint venture partners, team members, and subcontractors.* This clause addresses disadvantaged status for joint venture partners, teaming arrangement members, and subcontractors and is applicable if this contract contains small disadvantaged business (SDB) participation targets. The Contractor shall obtain representations of small disadvantaged status from joint venture partners, teaming arrangement members, and subcontractors through use of a provision substantially the same as paragraph (b)(1)(i) of the provision at FAR 52.219-22, Small Disadvantaged Business Status. The Contractor shall confirm that a joint venture partner, team member, or subcontractor representing itself as a small disadvantaged business concern, is identified as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net) or by contacting the SBA's Office of Small Disadvantaged Business Certification and Eligibility.

(b) *Reporting requirement.* If this contract contains SDB participation targets, the Contractor shall report on the participation of SDB concerns at contract completion, or as otherwise provided in this contract. Reporting may be on Optional Form 312, Small Disadvantaged Business Participation Report, or in the Contractor's own format providing the same information. This report is required for each contract containing SDB participation targets. If this contract contains an individual Small, Small Disadvantaged and Women-Owned Small Business

Subcontracting Plan, reports may be submitted with the final Subcontracting Report for Individual Contracts (Standard Form 294) at the completion of the contract.

CLAUSE I.19 - FAR 52.222-1 NOTICE TO THE GOVERNMENT OF LABOR DISPUTES (FEB 1997)

If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this contract, the Contractor shall immediately give notice, including all relevant information, to the Contracting Officer.

CLAUSE I.20 - FAR 52.222-3 CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if --

(a) (1) The worker is paid or is in an approved work training program on a voluntary basis;

(2) Representatives of local union central bodies or similar labor union organizations have been consulted;

(3) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services; and

(4) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and

(b) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

CLAUSE I.21 - FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT -- OVERTIME COMPENSATION (SEPT 2000)

(a) Overtime requirements. No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) Violation; liability for unpaid wages; liquidated damages. The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of $10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) Withholding for unpaid wages and liquidated damages. The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) Payrolls and basic records.

(1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act.

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of

this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or Department of Labor to interview employees in the workplace during working hours.

(e) Subcontracts. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts exceeding $100,000 and require subcontractors to include these provisions in any lower tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

CLAUSE I.22 - FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled, "Davis-Bacon Act", "Contract Work Hours and Safety Standards Act-Overtime Compensation", "Apprentices and Trainees", "Payrolls and Basic Records", "Compliance with Copeland Act Requirements", "Withholding of Funds", "Subcontracts (Labor Standards)", "Contract Termination-Debarment", "Disputes Concerning Labor Standards", "Compliance with Davis-Bacon and Related Act Regulations", and "Certification of Eligibility", and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with all the contract clauses cited in this paragraph.

(b) (1) Within fourteen (14) days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(2) Within fourteen (14) days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

CLAUSE I.22A - FAR 52.222-19 CHILD LABOR -- COOPERATION WITH AUTHORITIES AND REMEDIES (SEPT 2002)

(a) Applicability. This clause does not apply to the extent that the Contractor is supplying end products mined, produced, or manufactured in --

(1) Canada, and the anticipated value of the acquisition is $25,000 or more;

(2) Israel, and the anticipated value of the acquisition is $50,000 or more;

(3) Mexico, and the anticipated value of the acquisition is $56,190 or more; or

(4) Aruba, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Italy, Japan, Korea, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, or the United Kingdom and the anticipated value of the acquisition is $169,000 or more.

(b) Cooperation with Authorities. To enforce the laws prohibiting the manufacture or importation of products mined, produced, or manufactured by forced or indentured child labor, authorized officials may need to conduct investigations to determine whether forced or indentured child labor was used to mine, produce, or manufacture any product furnished under this contract. If the solicitation includes the provision 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products, or the equivalent at 52.212-3(i), the Contractor agrees to cooperate fully with authorized officials of the contracting agency, the Department of the Treasury, or the Department of Justice by providing reasonable access to records, documents, persons, or premises upon reasonable request by the authorized officials.

(c) Violations. The Government may impose remedies set forth in paragraph (d) for the following violations:

(1) The Contractor has submitted a false certification regarding knowledge of the use of forced or indentured child labor for listed end products.

(2) The Contractor has failed to cooperate, if required, in accordance with paragraph (b) of this clause, with an investigation of the use of forced or indentured child labor by an Inspector General, Attorney General, or the Secretary of the Treasury.

(3) The Contractor uses forced or indentured child labor in its mining, production, or manufacturing processes.

(4) The Contractor has furnished under the contract end products or components that have been mined, produced, or manufactured wholly or in part by forced or indentured child labor. (The Government will not pursue remedies at paragraph (d)(2) or paragraph (d)(3) of this clause unless sufficient evidence indicates that the Contractor knew of the violation.)

(d) Remedies.

(1) The Contracting Officer may terminate the contract.

(2) The suspending official may suspend the Contractor in accordance with procedures in FAR Subpart 9.4.

(3) The debarring official may debar the Contractor for a period not to exceed 3 years in accordance with the procedures in FAR Subpart 9.4.

CLAUSE I.23 - FAR 52.222-21 PROHIBITION OF SEGREGATED FACILITIES (FEB 1999)

(a) *Segregated facilities,* as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

CLAUSE I.24 - FAR 52.222-26 EQUAL OPPORTUNITY (APR 2002)

(a) *Definition.* "United States," as used in this clause, means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of $10,000, the Contractor shall comply with paragraphs (b)(1) through (b)(11) of this clause, except for work performed outside the United States by employees who were not recruited within the United States. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to -

(i) Employment;

(ii) Upgrading;

(iii) Demotion;

(iv) Transfer;

(v) Recruitment or recruitment advertising;

(vi) Layoff or termination;

(vii) Rates of pay or other forms of compensation; and

(viii) Selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of paragraphs (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the Contracting Officer may direct as a means of enforcing these terms and conditions, including sanctions for noncompliance, provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

CLAUSE I.25 - FAR 52.222-29 NOTIFICATION OF VISA DENIAL (FEB 1999)

It is a violation of Executive Order 11246, as amended, for a Contractor to refuse to employ any applicant or not to assign any person hired in the United States, on the basis that the individual's race, color, religion, sex, or national origin is not compatible with the policies of the country where the work is to be performed or for whom the work will be performed (41 CFR 60-1.10). The Contractor agrees to notify the U.S. Department of State, Assistant Secretary, Bureau of Political-Military Affairs (PM), 2201 C Street NW, Room 7325, Washington, D.C. 20520, and the U.S. Department of Labor, Deputy Assistant Secretary for Federal Contract Compliance, when it has knowledge of any employee or potential employee being denied an entry visa to a country in which the Contractor is required to perform this contract, and it believes the denial is attributable to the race, color, religion, sex, or national origin of the employee or potential employee.

CLAUSE I.26 - FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) *Definitions.* As used in this clause –

"All employment openings" means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

"Executive and top management" means any employee -

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs (1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

"Other eligible veteran" means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

"Positions that will be filled from within the Contractor's organization" means employment openings for which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly established "recall" lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

"Qualified special disabled veteran" means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

"Special disabled veteran" means-

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability-

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (*i.e.*, a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

"Veteran of the Vietnam era" means a person who-

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred -

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed -

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.

(b) *General.*

(1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as-

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) *Listing openings.*

(1) The Contractor shall immediately list all employment openings that exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract, and including those occurring at an establishment of the Contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, at an appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) *Applicability.* This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) *Postings.*

(1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall-

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement, or other contract understanding, that the Contractor is bound by the terms of the Act and is committed to take affirmative action to employ, and advance in employment, qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) *Noncompliance.* If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) *Subcontracts.* The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as

specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for noncompliance.

CLAUSE I.27 - FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General.

(1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as --

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;

(iii) Rates of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor, including social or recreational programs; and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings.

(1) The Contractor agrees to post employment notices stating -- (i) the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and (ii) the rights of applicants and employees.

(2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary), and shall be provided by or through the Contracting Officer.

(3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.

(c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.

(d) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of $10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

CLAUSE I.28 - FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on -

(1) The number of special disabled veterans, the number of veterans of the Vietnam era, and other eligible veterans in the workforce of the Contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of the total, the number of special disabled veterans, the number of veterans of the Vietnam era, and the number of other eligible veterans; and

(3) The maximum number and the minimum number of employees of the Contractor during the period covered by the report.

(b) The Contractor shall report the above items by completing the Form VETS-100, entitled "Federal Contractor Veterans' Employment Report (VETS-100 Report)".

(c) The Contractor shall submit VETS-100 Reports no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date -

(1) As of the end of any pay period between July 1 and August 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The Contractor shall base the count of veterans reported according to paragraph (a) of this clause on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all special disabled veterans, veterans of the Vietnam era, and other eligible veterans who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that-

(1) The information is voluntarily provided;

(2) The information will be kept confidential;

(3) Disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and

(4) The information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of $25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

CLAUSE I.29 - FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998)

(a) Executive Order 12856 of August 3, 1993, requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA)(42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990(PPA)(42 U.S.C. 13101-13109).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section 313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

CLAUSE I.29A – FAR 52.223-10 WASTE REDUCTION PROGRAM (AUG 2000)

(a) *Definitions*. As used in this clause -

"Recycling" means the series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials in the manufacture of products other than fuel for producing heat or power by combustion.

"Waste prevention" means any change in the design, manufacturing, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they are discarded. Waste prevention also refers to the reuse of products or materials.

"Waste reduction" means preventing or decreasing the amount of waste being generated through waste prevention, recycling, or purchasing recycled and environmentally preferable products.

(b) Consistent with the requirements of Section 701 of Executive Order 13101, the Contractor shall establish a program to promote cost-effective waste reduction in all operations and facilities covered by this contract. The Contractor's programs shall comply with applicable Federal, State, and local requirements, specifically including Section 6002 of the Resource Conservation and Recovery Act (42 U.S.C. 6962, *et seq.*) and implementing regulations (40 CFR part 247).

CLAUSE I.30 - FAR 52.223-12 REFRIGERATION EQUIPMENT AND AIR CONDITIONERS (MAY 1995)

The Contractor shall comply with the applicable requirements of Sections 608 and 609 of the Clean Air Act (42 U.S.C. 7671g and 7671h) as each or both apply to this contract.

CLAUSE I.30A - FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor owned or operated facility used in the performance of this contract is exempt from the requirement to file an annual Form R if -

(1) The facility does not manufacture, process, or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

(3) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

(4) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

(5) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any of its owned or operated facilities used in the performance of this contract is no longer exempt -

(1) The Contractor shall notify the Contracting Officer; and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract that is no longer exempt, shall -

(i) Submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and

(ii) Continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items as defined in FAR Part 2, the Contractor shall -

(1) For competitive subcontracts expected to exceed $100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding $100,000 (including all options), the substance of this clause, except this paragraph (e).

CLAUSE I.31 - FAR 52.224-1 PRIVACY ACT NOTIFICATION (APR 1984)

The Contractor will be required to design, develop, or operate a system of records on individuals to accomplish an agency function subject to the Privacy Act of 1974, Public Law 93-579, December 31, 1974 (5 U.S.C. 552a) and applicable agency regulations. Violation of the Act may involve the imposition of criminal penalties.

CLAUSE I.32 - FAR 52.224-2 PRIVACY ACT (APR 1984)

(a) The Contractor agrees to:

(1) Comply with the Privacy Act of 1974 (the Act) and the agency rules and regulations issued under the Act in the design, development, or operation of any system of records on individuals to accomplish an agency function when the contract specifically identifies:

(i) The system of records; and

(ii) The design, development, or operation work that the Contractor is to perform;

(2) Include the Privacy Act notification contained in this contract in every solicitation and resulting subcontract and in every subcontract awarded without a solicitation, when the work statement in the proposed subcontract requires the redesign, development, or operation of a system of records on individuals that is subject to the Act; and

(3) Include this clause, including this subparagraph (3), in all subcontracts awarded under this contract which requires the design, development, or operation of such a system of records.

(b) In the event of violations of the Act, a civil action may be brought against the agency involved when the violation concerns the design, development, or operation of a system of records on individuals to accomplish an agency function, and criminal penalties may be imposed upon the officers or employees of the agency when the violation concerns the operation of a system of records on individuals to accomplish an agency function. For purposes of the Act, when the contract is for the operation of a system of records on individuals to accomplish an agency function, the Contractor is considered to be an employee of the agency.

(c) (1) "Operation of a system of records", as used in this Clause, means performance of any of the activities associated with maintaining the system of records, including the collection, use, and dissemination of records.

(2) "Record", as used in this Clause, means any item, collection, or grouping of information about an individual that is maintained by an agency, including, but not limited to, education, financial transactions, medical history, and criminal or employment history and that contains the person's name, or the identifying number, symbol, or other identifying particular

assigned to the individual, such as a fingerprint or voiceprint or a photograph.

(3) "System of records on individuals," as used in this Clause, means a group of any records under the control of any agency from which information is retrieved by the name of the individual or by some identifying number, symbol, or other identifying particular assigned to the individual.

CLAUSE I.33 – FAR 52.225-1 BUY AMERICAN ACT-- SUPPLIES (MAY 2002)

(a) *Definitions.* As used in this clause -

"Component" means an article, material, or supply incorporated directly into an end product.

"Cost of components" means -

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

"Domestic end product" means-

(1) An unmanufactured end product mined or produced in the United States; or

(2) An end product manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind as those that the agency determines are not mined, produced, or manufactured in sufficient and reasonably available commercial quantities of a satisfactory quality are treated as domestic. Scrap generated, collected, and prepared for processing in the United States is considered domestic.

"End product" means those articles, materials, and supplies to be acquired under the contract for public use.

"Foreign end product" means an end product other than a domestic end product.

"United States" means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) The Buy American Act (41 U.S.C. 10a - 10d) provides a preference for domestic end products for supplies acquired for use in the United States.

(c) Offerors may obtain from the Contracting Officer a list of foreign articles that the Contracting Officer will treat as domestic for this contract.

(d) The Contractor shall use only domestic end products except to the extent that it specified delivery of foreign end products in the provision of the solicitation entitled "Buy American Act Certificate."

CLAUSE I.34 - FAR 52.225-9 BUY AMERICAN ACT-- CONSTRUCTION MATERIALS (MAY 2002)

(a) *Definitions.* As used in this clause-

"Component" means an article, material, or supply incorporated directly into a construction material.

Construction material" means an article, material, or supply brought to the construction site by the Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

"Cost of components" means-

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the construction material (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

"Domestic construction material" means-

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

"Foreign construction material" means a construction material other than a domestic construction material.

"United States" means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Domestic preference.*

(1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows:

None

[*Contracting Officer to list applicable excepted materials or indicate "none"*]

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that-

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent;

(ii) The application of the restriction of the Buy American Act to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act.*

(1) (i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including-

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before

contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act applies, use of foreign construction material is noncompliant with the Buy American Act.

(d) *Data.* To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

Foreign and Domestic Construction Materials Price Comparison			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
Item 1:			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
Item 2:	_____	_____	_____
Foreign construction material	_____	_____	_____
Domestic construction material			

[List *name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]*
[Include other applicable supporting information.]
[Include all delivery costs to the construction site and any applicable duty*

(whether or not a duty-free entry certificate is issued).]

CLAUSE I.35 - FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JUL 2000)

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban, and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.

CLAUSE I.36 - RESERVED

CLAUSE I.37 - FAR 52.229-8 TAXES -- FOREIGN COST-REIMBURSEMENT CONTRACTS (MAR 1990)

(a) Any tax or duty from which the United States Government is exempt by agreement with the Government of the successor states of the former Soviet Union, (the Ukraine, Belarus, Kazakstan, Russia, the Baltic States of Latvia and Lithuania, and Uzbekistan) or from which the Contractor or any subcontractor under this contract is exempt under the laws of the successor states of the former Soviet Union, (the Ukraine, Belarus, Kazakstan, Russia, the Baltic States of Latvia and Lithuania, and Uzbekistan) shall not constitute an allowable cost under this contract.

(b) If the Contractor or subcontractor under this contract obtains a foreign tax credit that reduces its Federal income tax liability under the United States Internal Revenue Code (Title 26, U.S. Code) because of the payment of any tax or duty that was reimbursed under this contract, the amount of the reduction shall be paid or credited at the time of such offset to the Government of the United States as the Contracting Officer directs.

CLAUSE I.38 - FAR 52.230-2 COST ACCOUNTING STANDARDS (APR 1998)

(a) Unless the contract is exempt under 48 CFR 9903.201-1 and 9903.201-2, the provisions of 48 CFR, Part 9903 are incorporated herein by reference and the Contractor, in connection with this contract, shall --

(1) (CAS-covered Contracts Only) By submission of a Disclosure Statement, disclose, in writing, the Contractor's cost accounting practices as required by 48 CFR 9903.202-1 through 9903.202-5, including methods of distinguishing direct costs from indirect costs and the basis used for allocating indirect costs. The practices disclosed for this contract shall be the same as the practices currently disclosed and applied on all other contracts and subcontracts being performed by the Contractor and which contain a Cost Accounting Standards (CAS) clause. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

(2) Follow consistently the Contractor's cost accounting practices in accumulating and reporting contract performance cost data concerning this contract. If any change in cost accounting practices is made for the purposes of any contract or subcontract subject to CAS requirements, the change must be applied prospectively to this contract and the Disclosure Statement must be amended accordingly. If the contract price or cost allowance of this contract is affected by such changes, adjustment shall be made in accordance with subparagraph (a)(4) or (a)(5) of this Clause, as appropriate.

(3) Comply with all CAS, including any modifications and interpretations indicated thereto contained in 48 CFR, Part 9904, in effect on the date of award of this contract or, if the Contractor has submitted cost or pricing data, on the date of final agreement on price as shown on the Contractor's signed certificate of current cost or pricing data. The Contractor shall also comply with any CAS (or modifications to CAS) which hereafter become applicable to a contract or subcontract of the Contractor. Such compliance shall be required prospectively from the date of applicability to such contract or subcontract.

(4) (i) Agree to an equitable adjustment as provided in the Changes clause of this contract if the contract cost is affected by a change which, pursuant to subparagraph (a)(3) of this Clause, the Contractor is required to make to the Contractor's established cost accounting practices.

(ii) Negotiate with the Contracting Officer to determine the terms and conditions under which a change may be made to a cost accounting practice, other than a change made under other provisions of subparagraph (a)(4) of this Clause; provided that no agreement may be made under this provision that will increase costs paid by the United States.

(iii) When the Parties agree to a change to a cost accounting practice, other than a change under subdivision (a)(4)(i) of this Clause, negotiate an equitable adjustment as provided in the Changes clause of this contract.

(5) Agree to an adjustment of the contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with an applicable Cost Accounting Standard, or to follow any cost accounting practice consistently and such failure results in any increased costs paid by the United States. Such adjustment shall provide for recovery of the increased costs to the United States, together with interest thereon computed at the annual rate established under Section 6621 of the Internal Revenue Code of 1986 (26 U.S.C. 6621) for such period, from the time the payment by the United States was made to the time the adjustment is effected. In no case shall the Government recover costs greater than the increased cost to the Government, in the aggregate, on the relevant contracts subject to the price adjustment, unless the Contractor made a change in its cost accounting practices of which it was aware or should have been aware at the time of price negotiations and which it failed to disclose to the Government.

(b) If the Parties fail to agree whether the Contractor or a subcontractor has complied with an applicable CAS in 48 CFR Part 9904 or a CAS rule or regulation in 48 CFR Part 9903 and as to any cost adjustment demanded by the United States, such failure to agree will constitute a dispute under the Contract Disputes Act (41 U.S.C. 601).

(c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, or records relating to compliance with the requirements of this clause.

(d) The Contractor shall include in all negotiated subcontracts which the Contractor enters into, the substance of this clause, except paragraph (b), and shall require such inclusion in all other subcontracts, of any tier, including the obligation to comply with all CAS in effect on the subcontractor's award date or if the subcontractor has submitted cost or pricing data, on the date of final agreement on price as shown on the subcontractor's signed Certificate of Current Cost or Pricing Data. If the subcontract is awarded to a business unit which pursuant to

48 CFR 9903.201-2 is subject to other types of CAS coverage, the substance of the applicable clause set forth in subsection 30.201-4 of the Federal Acquisition Regulation shall be inserted. This requirement shall apply only to negotiated subcontracts in excess of $500,000, except that the requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1.

CLAUSE I.39 - FAR 52.230-6 ADMINISTRATION OF COST ACCOUNTING STANDARDS (NOV 1999)

For the purpose of administering the Cost Accounting Standards (CAS) requirements under this contract, the Contractor shall take the steps outlined in paragraphs (a) through (g) of this clause:

(a) Submit to the Contracting Officer a description of any cost accounting practice change, the total potential impact of the change on contracts containing a CAS clause, and a general dollar magnitude of the change which identifies the potential shift of costs between CAS-covered contracts by contract type (i.e., firm-fixed-price, incentive, cost-plus-fixed fee, etc.) and other contractor business activity. As related to CAS-covered contracts, the analysis should identify the potential impact on funds of the various Agencies/Departments (i.e., Department of Energy, National Aeronautics and Space Administration, Army, Navy, Air Force, other Department of Defense, other Government) as follows:

(1) For any change in cost accounting practices required in accordance with subparagraph (a)(3) and subdivision (a)(4)(i) of the clause at FAR 52.230-2, Cost Accounting Standards; or subparagraph (a)(3) and subdivisions (a)(4)(i) or (a)(4)(iv) of the clause at FAR 52.230-5, Cost Accounting Standards--Educational Institution; within 60 days (or such other date as may be mutually agreed to) after award of a contract requiring this change.

(2) For any change in cost accounting practices proposed in accordance with subdivision (a)(4)(ii) or (iii) of the clauses at FAR 52.230-2, Cost Accounting Standards, and FAR 52.230-5, Cost Accounting Standards--Educational Institution; or with subparagraph (a)(3) of the clause at FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices, not less than 60 days (or such other date as may be mutually agreed to) before the effective date of the proposed change.

(3) For any failure to comply with an applicable CAS or to follow a disclosed practice (as contemplated by subparagraph (a)(5) at FAR 52.230-2, Cost Accounting Standards, and FAR 52.230-5, Cost Accounting Standards--Educational Institution; or by subparagraph (a)(4) at FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices):

(i) Within 60 days (or such other date as may be mutually agreed to) after the date of agreement with the initial finding of noncompliance, or

(ii) In the event of Contractor disagreement with the initial finding of noncompliance, within 60 days of the date the Contractor is notified by the Contracting Officer of the determination of noncompliance.

(b) After an ACO, or cognizant Federal agency official, determination of materiality, submit a cost impact proposal in the form and manner specified by the Contracting Officer within 60 days (or such other date as may be mutually agreed to) after the date of determination of the adequacy and compliance of a change submitted pursuant to paragraph (a) of this clause. The cost impact proposal shall be in sufficient detail to permit evaluation, determination, and negotiation of the cost impact upon each separate CAS-covered contract and subcontract.

(1) Cost impact proposals submitted for changes in cost accounting practices required in accordance with subparagraph (a)(3) and subdivision (a)(4)(i) of the clause at FAR 52.230-2, Cost Accounting Standards; or subparagraph (a)(3) and subdivisions (a)(4)(i) or (a)(4)(iv) of the clause at FAR 52.230-5, Cost Accounting Standards--Educational Institution; shall identify the applicable standard or cost principle and all contracts and subcontracts containing the clauses entitled Cost Accounting Standards or Cost Accounting Standards--Educational Institution, which have an award date before the effective date of that standard or cost principle.

(2) Cost impact proposals submitted for any change in cost accounting practices proposed in accordance with subdivisions (a)(4)(ii) or (iii) of the clauses at FAR 52.230-2, Cost Accounting Standards, and FAR 52.230-5, Cost Accounting Standards--Educational Institution; or with subparagraph (a)(3) of the clause at FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices; shall identify all contracts and subcontracts containing the clauses at FAR 52.230-2, Cost Accounting Standards, FAR 52.230-5, Cost Accounting Standards--Educational Institution, and FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices.

(3) Cost impact proposals submitted for failure to comply with an applicable CAS or to follow a disclosed practice as contemplated by subparagraph (a)(5) of the clauses at FAR 52.230-2, Cost Accounting Standards, and FAR 52.230-5, Cost Accounting Standards--Educational Institution; or by subparagraph (a)(4) of the clause at FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices, shall identify the cost impact on each separate CAS covered contract from the date of failure to comply until the noncompliance is corrected.

(c) If the submissions required by paragraphs (a) and (b) of this clause are not submitted within the specified time, or any extension granted by the Contracting Officer, an amount not to exceed 10 percent of each subsequent amount determined payable related to the Contractor's CAS-covered prime contracts, up to the estimated general dollar magnitude of the cost impact, may be withheld until such time as the required submission has been provided in the form and manner specified by the Contracting Officer.

(d) Agree to appropriate contract and subcontract amendments to reflect adjustments established in accordance with subparagraphs (a)(4) and (a)(5) of the clauses at FAR 52.230-2 and 52.230-5; or with subparagraphs (a)(3) or (a)(4) of the Disclosure and Consistency of Cost Accounting Practices clause at FAR 52.230-3.

(e) For all subcontracts subject to the clauses at FAR 52.230-2, 52.230-3, or 52.230-5 --

(1) So state in the body of the subcontract, in the letter of award, or in both (self-deleting clauses shall not be used);

(2) Include the substance of this clause in all negotiated subcontracts; and

(3) Within 30 days after award of the subcontract, submit the following information to the Contractor's cognizant contract administration office for transmittal to the contract administration office cognizant of the subcontractor's facility:

(i) Subcontractor's name and subcontract number.

(ii) Dollar amount and date of award.

(iii) Name of Contractor making the award.

(f) Notify the Contracting Officer in writing of any adjustments required to subcontracts under this contract and agree to an adjustment, based on them, to this contract price or estimated cost and fee. This notice is due within 30 days after proposed subcontract adjustments are received and shall include a proposal for adjusting the higher tier subcontract or the prime contract appropriately.

(g) For subcontracts containing the clauses at FAR 52.230-2 or 52.230-5, require the subcontractor to comply with all Standards in effect on the date of award or of final agreement on price, as shown on the subcontractor's signed Certificate of Current Cost or Pricing Data, whichever is earlier.

CLAUSE I.40 - FAR 52.232-17 INTEREST (JUN 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(b) Amounts shall be due at the earliest of the following dates:

(1) The date fixed under this contract.

(2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination.

(3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.

(4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification.

(c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

CLAUSE I.41 - RESERVED

CLAUSE I.42 - FAR 52.232-24 PROHIBITION OF ASSIGNMENT OF CLAIMS (JAN 1986)

The assignment of claims under the Assignment of Claims Act of 1940, as amended, 31 U.S.C. 3727, 41 U.S.C. 15, is prohibited for this contract.

CLAUSE I.43 - FAR 52.233-1 DISPUTES (JUL 2002) (ALTERNATE I) (DEC 1991)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C.601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding $100,000 is not a claim under the Act until certified. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d) (1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) The Contractor shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding $100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows: "I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor."

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of $100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over $100,000, the Contracting Officer

must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date that the Contracting Officer receives the claim (certified, if required); or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in FAR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

CLAUSE I.44 - FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996) (ALTERNATE I) (JUNE 1985)

(a) Upon receipt of a notice of protest (as defined in 33.101 of the FAR) the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either --

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Termination clause of this contract.

(b) If a stop-work order issued under this clause is cancelled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule, the estimated cost, the fee, or a combination thereof, and in any other terms of the contract that may be affected, and the contract shall be modified, in writing, accordingly, if -

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within thirty (30) days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not cancelled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not cancelled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this Clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs.

CLAUSE I.45 - FAR 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

CLAUSE I.46 - FAR 52.237-3 CONTINUITY OF SERVICES (JAN 1991)

(a) The Contractor recognizes that the services under this contract are vital to the Government and must be continued without interruption and that, upon contract expiration, a successor, either the Government or another Contractor, may continue them. The Contractor agrees to (1) furnish phase-in training, and (2) exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.

(b) The Contractor shall, upon the Contracting Officer's written notice, (1) furnish phase-in, phase-out services for up to ninety (90) days after this contract expires and (2) negotiate in good faith a plan with a successor to determine the nature and extent of phase-in, phase-out services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the Contracting Officer's approval. The Contractor shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this contract are maintained at the required level of proficiency.

(c) The Contractor shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this contract. The Contractor also shall disclose necessary personnel records and allow the successor to conduct on-site interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.

(d) The Contractor shall be reimbursed for all reasonable phase-in, phase-out costs (i.e., costs incurred within the agreed period after contract expiration that result from phase-in, phase-out operations) and a fee (profit) not to exceed a pro rata portion of the fee (profit) under this contract.

CLAUSE I.47 - FAR 52.242-1 NOTICE OF INTENT TO DISALLOW COSTS (APR 1984)

(a) Notwithstanding any other clause of this contract --

(1) The Contracting Officer may, at any time, issue to the Contractor a written notice of intent to disallow specified costs incurred or planned for incurrence under this contract that have been determined not to be allowable under the contract terms; and

(2) The Contractor may, after receiving a notice under subparagraph (1) above, submit a written response to the Contracting Officer, with

justification for allowance of the costs. If the Contractor does respond within sixty (60) days, the Contracting Officer shall, within sixty (60) days of receiving the response, either make a written withdrawal of the notice or issue a written decision.

(b) Failure to issue a notice under this Notice of Intent to Disallow Costs clause shall not affect the Government's rights to take exception to incurred costs.

CLAUSE I.48 - FAR 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five (5) days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

CLAUSE I.49 - FAR 52.244-5 COMPETITION IN SUBCONTRACTING (DEC 1996)

(a) The Contractor shall select subcontractors (including suppliers) on a competitive basis to the maximum practical extent consistent with the objectives and requirements of the contract.

(b) If the Contractor is an approved mentor under the Department of Defense Pilot Mentor-Protege Program (Pub. L. 101-510, section 831 as amended), the Contractor may award subcontracts under this contract on a noncompetitive basis to its proteges.

CLAUSE I.50 - FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2002)

(a) *Definitions.* As used in this clause -

"Commercial item" has the meaning contained in the clause at 52.202-1, Definitions.

"Subcontract" includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c) (1) The Contractor shall insert the following clauses in subcontracts for commercial items:

(i) 52.219-8, Utilization of Small Business Concerns (Oct 2000) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds $500,000 ($1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(ii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).

(iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212(a));

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).

(v) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (June 2000) (46 U.S.C. Appx 1241) (flowdown not required for subcontracts awarded beginning May 1, 1996).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

CLAUSE I.51 - FAR 52.247-1 COMMERCIAL BILL OF LADING NOTATIONS (APR 1984)

If the Contracting Officer authorizes supplies to be shipped on a commercial bill of lading and the Contractor will be reimbursed these transportation costs as direct allowable costs, the Contractor shall ensure before shipment is made that the commercial shipping documents are annotated with either of the following notations, as appropriate:

(a) If the Government is shown as the consignor or the consignee, the annotation shall be:

Transportation is for the U.S. Department of Energy and the actual total transportation charges paid to the carrier(s) by the consignor or consignee are assignable to, and shall be reimbursed by, the Government.

(b) If the Government is not shown as the consignor or the consignee, the annotation shall be:

Transportation is for the U.S. Department of Energy and the actual total transportation charges paid to the carrier(s) by the consignor or consignee shall be reimbursed by the Government, pursuant to cost-reimbursement Contract No. DE-AC02-98CH10886. This may be confirmed by contacting the U.S. Department of Energy, Brookhaven Area Office, 53 Bell Avenue, Bldg. 464, Upton, New York 11973.

CLAUSE I.52 - FAR 52.247-63 PREFERENCE FOR U.S. FLAG AIR CARRIERS (JAN 1997)

(a) "International air transportation", as used in this clause, means transportation by air between a place in the United States and a place outside the United States or between two places both of which are outside the United States.
"United States", as used in this clause, means the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, and possessions of the United States.

"U.S.-Flag air carrier," as used in this clause, means an air carrier holding a certificate under 49 U.S.C. Chapter 411.

(b) Section 5 of the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118)(Fly America-Act) requires that all Federal agencies and Government Contractors and subcontractors use U.S.-flag air carriers for U.S. Government-financed international air transportation of personnel (and their personal effects) or property, to the extent that service by those carriers is available. It requires the Comptroller General of the United States, in the absence of satisfactory proof of the necessity for foreign-flag air transportation, to disallow expenditures from funds, appropriated or otherwise established for the account of the United States, for international air transportation secured aboard a foreign-flag air carrier if a U.S.-flag air carrier is available to provide such services.

(c) The Contractor agrees, in performing work under this contract, to use U.S.-flag air carriers for international air transportation of personnel (and their personal effects) or property to the extent that service by those carriers is available.

(d) In the event that the Contractor selects a carrier other than a U.S.-flag air carrier for international air transportation, the Contractor shall include a statement on vouchers involving such transportation essentially as follows:

STATEMENT OF UNAVAILABILITY OF U.S.-FLAG AIR CARRIERS

International air transportation of persons (and their personal effects) or property by U.S.-flag air carrier was not available or it was necessary to use foreign-flag air carrier service for the following reasons (see Section 47.403 of the Federal Acquisition Regulation):

[State reasons]:

(End of Statement)

(e) The Contractor shall include the substance of this clause, including this paragraph (e), in each subcontract or purchase order under this contract that may involve international air transportation.

CLAUSE I.53 - FAR 52.247-64 PREFERENCE FOR PRIVATELY OWNED U.S.-FLAG COMMERCIAL VESSELS (JUN 2000)

(a) The Cargo Preference Act of 1954 (46 U.S.C. 1241(b)) requires that Federal departments and agencies shall transport in privately owned U.S.-flag commercial vessels at least 50 percent of the gross tonnage of equipment, materials, or commodities that may be transported in ocean vessels (computed separately for dry bulk carriers, dry cargo liners, and tankers). Such transportation shall be accomplished when any equipment, materials, or commodities, located within or outside the United States, that may be transported by ocean vessel are --

(1) Acquired for a U.S. Government agency account;

(2) Furnished to, or for the account of, any foreign nation without provision for reimbursement;

(3) Furnished for the account of a foreign nation in connection with which the United States advances funds or credits, or guarantees the convertibility of foreign currencies; or

(4) Acquired with advance of funds, loans, or guaranties made by or on behalf of the United States.

(b) The Contractor shall use privately owned U.S.-flag commercial vessels to ship at least 50 percent of the gross tonnage involved under this contract (computed separately for dry bulk carriers, dry cargo liners, and tankers) whenever shipping any equipment, materials, or commodities under the conditions set forth in paragraph (a) of this clause, to the extent that such vessels are available at rates that are fair and reasonable for privately owned U.S.-flag commercial vessels.

(c) (1) The Contractor shall submit one legible copy of a rated on-board ocean bill of lading for each shipment to both --

(i) The Contracting Officer, and

(ii) The:
Office of Cargo Preference
Maritime Administration (MAR-590)
400 Seventh Street, SW
Washington DC 20590.

Subcontractor bills of lading shall be submitted through the Prime Contractor.

(2) The Contractor shall furnish these bill of lading copies (i) within 20 working days of the date of loading for shipments originating in the United States, or (ii) within 30 working days for shipments originating outside the United States. Each bill of lading copy shall contain the following information:

(A) Sponsoring U.S. Government agency.

(B) Name of vessel.

(C) Vessel flag of registry.

(D) Date of loading.

(E) Port of loading.

(F) Port of final discharge.

(G) Description of commodity.

(H) Gross weight in pounds and cubic feet if available.

(l) Total ocean freight revenue in U.S. dollars.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in all subcontracts or purchase orders under this contract.

(e) The requirement in paragraph (a) does not apply to --

(1) Cargoes carried in vessels of the Panama Canal Commission or as required or authorized by law or treaty;

(2) Ocean transportation between foreign countries of supplies purchased with foreign currencies made available, or derived from funds that are made available, under the Foreign Assistance Act of 1961 (22 U.S.C. 2353); and

(3) Shipments of classified supplies when the classification prohibits the use of non-Government vessels.

(f) Guidance regarding fair and reasonable rates for privately owned U.S.-flag commercial vessels may be obtained from the:

Office of Costs and Rates
Maritime Administration
400 Seventh Street, SW
Washington DC 20590
Phone: 202-366-4610.

CLAUSE I.54 - FAR 52.247-67 SUBMISSION OF COMMERCIAL TRANSPORTATION BILLS TO THE GENERAL SERVICES ADMINISTRATION FOR AUDIT (JUN 1997)

(a) (1) In accordance with paragraph (a)(2) of this clause, the Contractor shall submit to the General Services Administration (GSA) for audit, legible copies of all paid freight bills/invoices, commercial bills of lading (CBL's), passenger coupons, and other supporting documents for transportation services on which the United States will assume freight charges that were paid --

(i) By the Contractor under a cost-reimbursement contract; and

(ii) By a first-tier subcontractor under a cost-reimbursement subcontract thereunder.

(2) Cost-reimbursement Contractors shall only submit for audit those CBL's with freight shipment charges exceeding $50.00. Bills under $50.00 shall

be retained on-site by the Contractor and made available for GSA on-site audits. This exception only applies to freight shipment bills and is not intended to apply to bills and invoices for any other transportation services.

(b) The Contractor shall forward copies of paid freight bills/invoices, CBL's, passenger coupons, and supporting documents as soon as possible following the end of the month, in one package to the:

General Services Administration
Attn: FWA
1800 F Street, NW
Washington, DC 20405

The Contractor shall include the paid freight bills/invoices, CBL's, passenger coupons, and supporting documents for first-tier subcontractors under a cost-reimbursement contract. If the inclusion of the paid freight bills/invoices, CBL's, passenger coupons, and supporting documents for any subcontractor in the shipment is not practicable, the documents may be forward to GSA in a separate package.

(c) Any original transportation bills or other documents requested by GSA shall be forwarded promptly by the Contractor to GSA. The Contractor shall ensure that the name of the contracting agency is stamped or written on the face of the bill before sending it to GSA.

(d) A statement prepared in duplicate by the Contractor shall accompany each shipment of transportation documents. GSA will acknowledge receipt of the shipment by signing and returning the copy of the statement. The statement shall show --

(1) The name and address of the Contractor;

(2) The contract number including any alpha-numeric prefix identifying the Contracting Office;

(3) The name and address of the Contracting Office;

(4) The total number of bills submitted with the statement; and

(5) A listing of the respective amounts paid or, in lieu of such listing, an adding machine tape of the amounts paid showing the Contractor's voucher or check numbers.

CLAUSE I.55 - DEAR 970.5204-45 TERMINATION (OCT 1995) (MODIFIED)

(a) This contract shall continue until January 4, 2004, unless sooner terminated in accordance with the provisions which follow:

(1) The performance of work under this contract may be terminated by the Government in whole, or from time to time in part, (i) whenever the Contractor shall default in performance, and shall fail to cure the fault or failure within such period as the Contracting Officer may allow after receipt from the Contracting Officer of a notice specifying the fault or failure, or (ii) whenever, for any reason, the Contracting Officer shall determine any such termination is for the best interest of the Government. Termination of the work hereunder shall be effected by delivery of a notice of termination specifying whether termination is for default of the Contractor or for the convenience of the Government, the extent to which performance of work under the contract shall be terminated, and the date upon which such termination shall become effective. Any such termination shall be without prejudice to any claim which either party may have against the other. If, after notice of termination under the provisions of (a)(1)(i) of this section, it is determined for any reason that the Contractor was not in default, such notice of default shall be deemed to have been issued pursuant to (a)(1)(ii) of this section, the rights and obligations of the Parties hereto shall in such event be governed accordingly.

(2) Upon receipt of notice of termination, in accordance with (1) above, the Contractor shall, to the extent directed, in writing, by the Contracting Officer, discontinue the terminated work and the placing of orders for materials, facilities, supplies, and services in connection therewith, and shall proceed, if, and to the extent required by the Contracting Officer, to cancel promptly and settle with the approval of the Contracting Officer, existing orders, subcontracts, and commitments insofar as such orders, subcontracts, and commitments pertain to this contract.

(b) Upon the termination of this contract, full and complete settlement of all claims of the Contractor and of DOE arising out of this contract shall be made as follows:

(1) The Government shall have the right in its discretion to assume sole responsibility for any or all obligations, commitments, and claims that the Contractor may have undertaken or incurred, the cost of which are allowable in accordance with the provisions of this contract; and the Contractor shall, as a condition of receiving the payments mentioned in this Clause, execute and deliver all such papers and; take all such steps as the Contracting Officer may require for the purpose of fully vesting in the

Government any rights and benefits the Contractor may have under or in connection with such obligations, commitments, or claims.

(2) The Government shall treat as allowable costs all expenditures made in accordance with and allowable under Clause I.80A, Allowable Costs and Fees (Management and Operating Contracts) not previously so allowed or otherwise credited for work performed prior to the effective date of termination, together with expenditures as may be incurred for a reasonable time thereafter with the approval of, or as directed by, the Contracting Officer.

(3) The Government shall treat as allowable costs, to the extent not included in (b)(2) above, the costs of settling and paying claims arising out of the termination of work under orders, subcontracts, and commitments as provided in (a)(2) above.

(4) The Government shall treat as allowable costs the reasonable costs of settlement, including accounting, legal, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the termination of the contract and for the termination and settlement of orders and subcontracts thereunder, together with such further expenditures made by the Contractor after the date of termination for the protection or disposition of Government property as are approved or required by the Contracting Officer; provided, however, that if the termination is for default of the Contractor, there shall not be included any amount for preparation of the Contractor's settlement proposal.

(5) If performance of work under this contract is terminated in whole by the Government, the performance fee of the Contractor shall be prorated to, and including the effective date of such termination. In addition, if the termination is for the convenience of the Government, the Contractor shall be paid a fixed fee in an amount to be agreed upon as compensation for its services in closing out the work under this contract after the effective date of such termination. The additional fixed fee is to be negotiated as soon as practicable after service of notice of termination, shall take into account the estimate of the cost of the services and managerial effort to be rendered under this clause after the effective date of termination, and shall be provided for in a supplement or amendment to this contract prior to final settlement hereunder. Pending agreement as to the amount of such fee, the Contractor shall diligently proceed with the performance of the services required under this Clause. No additional fee will be paid if the contract is terminated due to the default of the Contractor. In the event of a partial termination by the Government, an equitable adjustment shall be made in the performance fee if such termination results in a material decrease in

the level of the Contractor's management effort. Any failure to agree on the right to or the amount of any adjustment shall be deemed a dispute within the purview of the Clause I.43, Disputes.

(6) The obligation of the Government to make any of the payments required by this Clause or any other provisions of this contract shall be subject to any unsettled claims in connection with this contract which the Government may have against the Contractor.

(c) Prior to final settlement, the Contractor shall furnish a release as required in Clause I.102, Payments and Advances, and account for Government-owned property as may be required by the Contracting Officer; provided, however, that unless the Contracting Officer requires an inventory, the maintenance and disposition of the records of Government-owned property in accordance with Clause I.103, Accounts, Records and Inspection, shall be accepted by the Contracting Officer as full compliance with all requirements of this contract pertaining to an accounting for such property.

CLAUSE I.56 - FAR 52.249-14 EXCUSABLE DELAYS (APR 1984)

(a) Except for defaults of subcontractors at any tier, the Contractor shall not be in default because of any failure to perform this contract under its terms if the failure arises from causes beyond the control and without the fault or negligence of the Contractor. Examples of these causes are (1) acts of God or of the public enemy, (2) acts of the Government in either its sovereign or contractual capacity, (3) fires, (4) floods, (5) epidemics, (6) quarantine restrictions, (7) strikes, (8) freight embargoes, and (9) unusually severe weather. In each instance, the failure to perform must be beyond the control and without the fault or negligence of the Contractor. "Default" includes failure to make progress in the work so as to endanger performance.

(b) If the failure to perform is caused by the failure of a subcontractor at any tier to perform or make progress, and if the cause of the failure was beyond the control of both the Contractor and subcontractor, and without the fault or negligence of either, the Contractor shall not be deemed to be in default, unless --

(1) The subcontracted supplies or services were obtainable from other sources;

(2) The Contracting Officer ordered the Contractor in writing to purchase these supplies or services from the other source; and

(3) The Contractor failed to comply reasonably with this order.

(c) Upon request of the Contractor, the Contracting Officer shall ascertain the facts and extent of the failure. If the Contracting Officer determines that any failure to perform results from one or more of the causes above, the delivery schedule shall be revised, subject to the rights of the Government under the termination clause of this contract.

CLAUSE I.56A - FAR 52.250-1 INDEMNIFICATION UNDER PUBLIC LAW 85-804 (APR 1984) ALTERNATE I (APR 1984) (DEVIATION)

(a) "Contractor's principal officials," as used in this clause, means directors, officers, managers, superintendents, or other representatives supervising or directing –

(1) All or substantially all of the Contractor's business;

(2) All or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed; or

(3) A separate and complete major industrial operation in connection with the performance of this contract.

(b) Under Public Law 85-804 (50 U.S.C. 1431-1435) and Executive Order 10789, as amended, and regardless of any other provisions of this contract, the Government shall, subject to the limitations contained in the other paragraphs of this clause, indemnify the Contractor against --

(1) Claims (including reasonable expenses of litigation or settlement) by third persons (including employees of the Contractor) for death; personal injury; or loss of, damage to, or loss of use of property;

(2) Loss of, damage to, or loss of use of Contractor property, excluding loss of profit; and

(3) Loss of, damage to, or loss of use of Government property, excluding loss of profit.

(c) This indemnification applies only to the extent that the claim, loss, or damage (1) arises out of or results from a risk defined in this contract as unusually hazardous or nuclear and (2) is not compensated for by insurance or otherwise. Any such claim, loss, or damage, to the extent that it is within the deductible amounts of the Contractor's insurance, is not covered under this clause. If insurance coverage or other financial protection in effect on the date the approving official authorizes use of this clause is reduced, the Government's liability under this clause shall not increase as a result.

(d) When the claim, loss, or damage is caused by willful misconduct or lack of good faith on the part of any of the Contractor's principal officials, the Contractor shall not be indemnified for --

(1) Government claims against the Contractor (other than those arising through subrogation); or

(2) Loss or damage affecting the Contractor's property.

(e) With the Contracting Officer's prior written approval, the Contractor may, in any subcontract under this contract, indemnify the subcontractor against any risk defined in this contract as unusually hazardous or nuclear. This indemnification shall provide, between the Contractor and the subcontractor, the same rights and duties, and the same provisions for notice, furnishing of evidence or proof, and Government settlement or defense of claims as this clause provides. The Contracting Officer may also approve indemnification of subcontractors at any lower tier, under the same terms and conditions. The Government shall indemnify the Contractor against liability to subcontractors incurred under subcontract provisions approved by the Contracting Officer.

(f) The rights and obligations of the parties under this clause shall survive this contract's termination, expiration, or completion. The Government shall make no payment under this clause unless the agency head determines that the amount is just and reasonable. The Government may pay the Contractor or subcontractors, or may directly pay parties to whom the Contractor or subcontractors may be liable.

(g) The Contractor shall --

(1) Promptly notify the Contracting Officer of any claim or action against, or any loss by, the Contractor or any subcontractors that may be reasonably be expected to involve indemnification under this clause;

(2) Immediately furnish to the Government copies of all pertinent papers the Contractor receives;

(3) Furnish evidence or proof of any claim, loss, or damage covered by this clause in the manner and form the Government requires; and

(4) Comply with the Government's directions and execute any authorizations required in connection with settlement or defense of claims or actions.

(h) The Government may direct, control, or assist in settling or defending any claim or action that may involve indemnification under this clause.

(i) The cost of insurance (including self-insurance programs) covering a risk defined in this contract as unusually hazardous or nuclear shall not be reimbursed except to the extent that the Contracting Officer has required or approved this insurance. The Government's obligations under this clause are --

(1) Excepted from the release required under this contract's clause relating to allowable cost; and

(2) Not affected by this contract's Obligation of Funds clause.

(j) The term "a risk defined in this contract as unusually hazardous or nuclear" as used in this clause means the risk of legal liability to third parties (including legal costs as defined in paragraph (jj) of Section 11 of the Atomic Energy Act of 1954, as amended, 42 U.S.C.§2014, notwithstanding the fact that the claim or suit may not arise under section 170 of said act) arising from actions or inactions in the course of the following work performed by the Contractor under this contract:

(1) Providing nuclear materials protection, control, and accounting (MPC&A) technical support to DOE in its participation in joint safeguards work under the Agreement Between the U.S. Department of Defense and the Russian Ministry for Atomic Energy Concerning Control, Accounting, and Physical Protection of Nuclear Materials, dated September 2, 1993, and any extension thereof.

(2) As requested or approved by the President of the United States, the Secretary of Energy, the Deputy Secretary of Energy, or the Under Secretary of Energy, providing assistance in MPC&A and other nonproliferation activities (including safeguards activities) outside the United States, other than the work identified in (1) above, provided that the request or approval referred to in this subparagraph specifically makes the indemnity provided by this clause applicable thereto.

CLAUSE I.57 - FAR 52.251-1 GOVERNMENT SUPPLY SOURCES (APR 1984)

The Contracting Officer may issue the Contractor an authorization to use Government supply sources in the performance of this contract. Title to all property acquired by the Contractor under such an authorization shall vest in the Government unless otherwise specified in the contract. Such property shall not be considered to be "Government-furnished property," as distinguished from "Government property." The provisions of the clause entitled "Government Property," except its paragraphs (a) and (b), shall apply to all property acquired under such authorization.

CLAUSE I.58 - FAR 52.251-2 INTERAGENCY FLEET MANAGEMENT SYSTEM VEHICLES AND RELATED SERVICES (JAN 1991)

The Contracting Officer may issue the Contractor an authorization to obtain interagency fleet management system (IFMS) vehicles and related services for use in the performance of this contract. The use, service, and maintenance of interagency fleet management system vehicles and the use of related services by the Contractor shall be in accordance with 41 CFR 101-39 and 41 CFR 101-38.301-1.

CLAUSE I.59 - FAR 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any Department of Energy Acquisition Regulation (48 CFR Chapter 9) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

CLAUSE I.60 - FAR 52.253-1 COMPUTER GENERATED FORMS (JAN 1991)

(a) Any data required to be submitted on a Standard or Optional Form prescribed by the Federal Acquisition Regulation (FAR) may be submitted on a computer generated version of the form, provided there is no change to the name, content, or sequence of the data elements on the form, and provided the form carries the Standard or Optional Form number and edition date.

(b) Unless prohibited by agency regulations, any data required to be submitted on an agency unique form prescribed by an agency supplement to the FAR may be submitted on a computer generated version of the form provided there is no change to the name, content, or sequence of the data elements on the form and provided the form carries the agency form number and edition date.

(c) If the Contractor submits a computer generated version of a form that is different than the required form, then the rights and obligations of the Parties will be determined based on the content of the required form.

CLAUSE I.61 - DEAR 952.203-70 WHISTLEBLOWER PROTECTION FOR CONTRACTOR EMPLOYEES (DEC 2000)

(a) The contractor shall comply with the requirements of "DOE Contractor Employee Protection Program" at 10 CFR part 708 for work performed on behalf of DOE directly related to activities at DOE-owned or -leased sites.

(b) The contractor shall insert or have inserted the substance of this clause, including this paragraph (b), in subcontracts at all tiers, for subcontracts involving work performed on behalf of DOE directly related to activities at DOE-owned or -leased sites.

CLAUSE I.62 - DEAR 952.204-2 SECURITY (MAY 2002)

(a) Responsibility. It is the Contractor's duty to safeguard all classified information, special nuclear material, and other DOE property. The Contractor shall, in accordance with DOE security regulations and requirements, be responsible for safeguarding all classified information and protecting against sabotage, espionage, loss or theft of the classified documents and material in the Contractor's possession in connection with the performance of work under this contract. Except as otherwise expressly provided in this contract, the Contractor shall, upon completion or termination of this contract, transmit to DOE any classified matter in the possession of the Contractor or any person under the Contractor's control in connection with performance of this contract. If retention by the Contractor of any classified matter is required after the completion or termination of the contract, the Contractor shall identify the items and types or categories of matter proposed for retention, the reasons for the retention of the matter, and the proposed period of retention. If the retention is approved by the Contracting Officer, the security provisions of the contract shall continue to be applicable to the matter retained. Special nuclear material shall not be retained after the completion or termination of the contract.

(b) Regulations. The Contractor agrees to comply with all security regulations and requirements of DOE in effect on the date of award.

(c) Definition of Classified Information. The term "classified information" means Restricted Data, Formerly Restricted Data, or National Security Information.

(d) Definition of Restricted Data. The term "Restricted Data" means all data concerning (1) design, manufacture, or utilization of atomic weapons; (2) the production of special nuclear material; or (3) the use of special nuclear material in the production of energy, but shall not include data declassified or removed from the Restricted Data category pursuant to Section 142 of the Atomic Energy Act of 1954, as amended.

(e) Definition of Formerly Restricted Data. The term "Formerly Restricted Data" means all data removed from the Restricted Data category under Section 142d. of the Atomic Energy Act of 1954, as amended.

(f) Definition of National Security Information. The term "National Security Information" means any information or material, regardless of its physical form or characteristics, that is owned by, produced for or by, or is under the control of the United States Government, that has been determined pursuant to Executive Order 12356 or prior Orders to require protection against unauthorized disclosure, and which is so designated.

(g) Definition of Special Nuclear Material (SNM). SNM means (1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, has been determined to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

(h) Security Clearance of Personnel. The Contractor shall not permit any individual to have access to any classified information, except in accordance with the Atomic Energy Act of 1954, as amended, Executive Order 12356, and the DOE's regulations or requirements applicable to the particular level and category of classified information to which access is required.

(i) Criminal Liability. It is understood that disclosure of any classified information relating to the work or services ordered hereunder to any person not entitled to receive it, or failure to safeguard any classified information that may come to the Contractor or any person under the Contractor's control in connection with work under this contract, may subject the Contractor, its agents, employees, or subcontractors to criminal liability under the laws of the United States. (See the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq.; 18 U.S.C. 793 and 794; and Executive Order 12356.)

(j) Foreign Ownership, Control or Influence.

(1) The Contractor shall immediately provide the cognizant security office written notice of any change in the extent and nature of foreign ownership, control or influence over the Contractor which would affect any answer to the questions presented in the Certificate Pertaining to Foreign Interests, Standard Form 328 or the Foreign Ownership, Control or Influence questionnaire executed by the Contractor prior to the award of this contract. In addition, any notice of changes in ownership or control which are required to be reported to the Securities and Exchange Commission, the Federal Trade Commission, or the Department of Justice shall also be furnished concurrently to the Contracting Officer.

(2) If a Contractor has changes involving foreign ownership, control or influence, DOE must determine whether the changes will pose an undue risk to the common defense and security. In making this determination, DOE will consider proposals made by the Contractor to avoid or mitigate foreign influences.

(3) If the cognizant security office at any time determines that the Contractor is, or is potentially, subject to foreign ownership, control or influence, the Contractor shall comply with such instructions as the Contracting Officer shall provide in writing to safeguard any classified information or special nuclear material.

(4) The Contractor agrees to insert terms that conform substantially to the language of this clause, including this paragraph, in all subcontracts under this contract that will require subcontractor employees to possess access authorizations. Additionally, the Contractor must require subcontractors to have an existing DOD or DOE Facility Clearance or submit a completed Certificate Pertaining to Foreign Interests, Standard Form 328, required in DEAR 952.204-73 prior to award of a subcontract. Information to be provided by a subcontractor pursuant to this clause may be submitted directly to the Contracting Officer. For purposes of this clause, subcontractor means any subcontractor at any tier and the term "Contracting Officer" means the DOE Contracting Officer. When this clause is included in a subcontract, the term "Contractor" shall mean Subcontractor and the term "contract" shall mean subcontract.

(5) The Contracting Officer may terminate this contract for default either if the Contractor fails to meet obligations imposed by this clause or if the Contractor creates a FOCI situation in order to avoid performance or a termination for default. The Contracting Officer may terminate this contract for convenience if the Contractor becomes subject to FOCI and for reasons other than avoidance of performance of the contract, cannot, or chooses not to, avoid or mitigate the FOCI problem.

CLAUSE I.63 - DEAR 952.204-70 CLASSIFICATION/DECLASSIFICATION (SEP 1997)

In the performance of work under this contract, the Contractor or subcontractor shall comply with all provisions of the Department of Energy's regulations and mandatory DOE directives which apply to work involving the classification and declassification of information, documents, or material. In this section, "information" means facts, data, or knowledge itself; "document" means the physical medium on or in which information is recorded; and "material" means a product or substance which contains or reveals information, regardless of its physical form or characteristics. Classified information is "Restricted Data" and "Formerly Restricted Data" (classified under the Atomic Energy

Act of 1954, as amended) and "National Security Information" (classified under Executive Order 12958 or prior Executive Orders). The original decision to classify or declassify information is considered an inherently Governmental function. For this reason, only Government personnel may serve as original classifiers, i.e., Federal Government Original Classifiers. Other personnel (Government or Contractor) may serve as derivative classifiers which involves making classification decisions based upon classification guidance which reflect decisions made by Federal Government Original Classifiers.

The Contractor or subcontractor shall ensure that any document or material that may contain classified information is reviewed by either a Federal Government or a Contractor Derivative Classifier in accordance with classification regulations including mandatory DOE directives and classification/declassification guidance furnished to the Contractor by the Department of Energy to determine whether it contains classified information prior to dissemination. For information which is not addressed in classification/declassification guidance, but whose sensitivity appears to warrant classification, the Contractor or subcontractor shall ensure that such information is reviewed by a Federal Government Original Classifier.

In addition, the Contractor or subcontractor shall ensure that existing classified documents (containing either Restricted Data or Formerly Restricted Data or National Security Information) which are in its possession or under its control are periodically reviewed by a Federal Government or Contractor Derivative Declassifier in accordance with classification regulations, mandatory DOE directives and classification/declassification guidance furnished to the Contractor by the Department of Energy to determine if the documents are no longer appropriately classified. Priorities for declassification review of classified documents shall be based on the degree of public and researcher interest and the likelihood of declassification upon review. Documents which no longer contain classified information are to be declassified. Declassified documents then shall be reviewed to determine if they are publicly releasable. Documents which are declassified and determined to be publicly releasable are to be made available to the public in order to maximize the public's access to as much Government information as possible while minimizing security costs.

The Contractor or subcontractor shall insert this clause in any subcontract which involves or may involve access to classified information.

CLAUSE I.64 - DEAR 952.204-75 PUBLIC AFFAIRS (DEC 2000)

(a) The Contractor must cooperate with the Department in releasing unclassified information to the public and news media regarding DOE policies, programs, and activities relating to its effort under the contract. The responsibilities under this clause must be accomplished through coordination with the Contracting Officer

and appropriate DOE public affairs personnel in accordance with procedures defined by the Contracting Officer.

(b) The Contractor is responsible for the development, planning, and coordination of proactive approaches for the timely dissemination of unclassified information regarding DOE activities onsite and offsite, including, but not limited to, operations and programs. Proactive public affairs programs may utilize a variety of communication media, including public workshops, meetings or hearings, open houses, newsletters, press releases, conferences, audio/visual presentations, speeches, forums, tours, and other appropriate stakeholder interactions.

(c) The Contractor's internal procedures must ensure that all releases of information to the public and news media are coordinated through, and approved by, a management official at an appropriate level within the Contractor's organization.

(d) The Contractor must comply with established DOE procedures for obtaining advance clearances on oral, written, and audio/visual informational material prepared for public dissemination or use.

(e) Unless prohibited by law, and in accordance with procedures defined by the Contracting Officer, the Contractor must notify the Contracting Officer and appropriate DOE public affairs personnel of communications or contacts with Members of Congress relating to the effort performed under the contract.

(f) In accordance with procedures defined by the Contracting Officer, the Contractor must notify the Contracting Officer and appropriate DOE public affairs personnel of activities or situations that may attract regional or national news media attention and of non-routine inquiries from national news media relating to the effort performed under the contract.

(g) In releases of information to the public and news media, the Contractor must fully and accurately identify the Contractor's relationship to the Department and fully and accurately credit the Department for its role in funding programs and projects resulting in scientific, technical, and other achievements.

CLAUSE I.65 - DEAR 952.208-7 TAGGING OF LEASED VEHICLES (APR 1984)

(a) DOE intends to use U.S. Government license tags.

(b) While it is the intention that vehicles leased hereunder shall operate on Federal tags, the DOE reserves the right to utilize State tags, if necessary, to accomplish its mission. Should State tags be required, the Contractor shall furnish the DOE the documentation required by the State to acquire such tags.

CLAUSE I.66 - DEAR 952.209-72 ORGANIZATIONAL CONFLICTS OF INTEREST (JUN 1997) (ALTERNATE I) (JUN 1997)

(a) Purpose. The purpose of this clause is to ensure that the Contractor (1) is not biased because of its financial, contractual, organizational, or other interests which relate to the work under this contract, and (2) does not obtain any unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described herein shall apply to performance or participation by the Contractor and any of its affiliates or their successors in interest (hereinafter collectively referred to as "Contractor") in the activities covered by this clause as a prime contractor, subcontractor, cosponsor, joint venturer, consultant, or in any similar capacity. For the purpose of this clause, affiliation occurs when a business concern is controlled by or has the power to control another or when a third party has the power to control both.

(1) Use of Contractor's Work Product.

(i) The Contractor shall be ineligible to participate in any capacity in Department contracts, subcontracts, or proposals therefor (solicited and unsolicited) which stem directly from the Contractor's performance of work under this contract for a period of five years after the completion of this contract. Furthermore, unless so directed in writing by the Contracting Officer, the Contractor shall not perform any advisory and assistance services work under this contract on any of its products or services or the products or services of another firm if the Contractor is or has been substantially involved in their development or marketing. Nothing in this subparagraph shall preclude the Contractor from competing for follow-on contracts for advisory and assistance services.

(ii) If, under this contract, the Contractor prepares a complete or essentially complete statement of work or specifications to be used in competitive acquisitions, the Contractor shall be ineligible to perform or participate in any capacity in any contractual effort which is based on such statement of work or specifications. The Contractor shall not incorporate its products or services in such statement of work or specifications unless so directed in writing by the Contracting Officer, in which case the restriction in this subparagraph shall not apply.

(iii) Nothing in this paragraph shall preclude the Contractor from offering or selling its standard and commercial items to the Government.

(2) Access to and use of information.

(i) If the Contractor, in the performance of this contract, obtains access to information, such as Department plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (5 U.S.C. 552a), or data which has not been released or otherwise made available to the public, the Contractor agrees that without prior written approval of the Contracting Officer it shall not:

(A) use such information for any private purpose unless the information has been released or otherwise made available to the public;

(B) compete for work for the Department based on such information for a period of six (6) months after either the completion of this contract or until such information is released or otherwise made available to the public, whichever is first;

(C) submit an unsolicited proposal to the Government which is based on such information until one year after such information is released or otherwise made available to the public; and

(D) release such information unless such information has previously been released or otherwise made available to the public by the Department.

(ii) In addition, the Contractor agrees that to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. 552a), or other confidential or privileged technical, business, or financial information under this contract, it shall treat such information in accordance with any restrictions imposed on such information.

(iii) The Contractor may use technical data it first produces under this contract for its private purposes consistent with paragraphs (b)(2)(i)(A) and (D) of this clause and the patent, rights in data, and security provisions of this contract.

(c) Disclosure after award.

(1) The Contractor agrees that, if changes, including additions, to the facts disclosed by it prior to award of this contract, occur during the performance of this contract, it shall make an immediate and full disclosure of such

changes in writing to the Contracting Officer. Such disclosure may include a description of any action which the Contractor has taken or proposes to take to avoid, neutralize, or mitigate any resulting conflict of interest. The Department may, however, terminate the contract for convenience if it deems such termination to be in the best interest of the Government.

(2) In the event that the Contractor was aware of facts required to be disclosed or the existence of an actual or potential organizational conflict of interest and did not disclose such facts or such conflict of interest to the Contracting Officer, DOE may terminate this contract for default.

(d) Remedies. For breach of any of the above restrictions or for nondisclosure or misrepresentation of any facts required to be disclosed concerning this contract, including the existence of an actual or potential organizational conflict of interest at the time of or after award, the Government may terminate the contract for default, disqualify the Contractor from subsequent related contractual efforts, and pursue such other remedies as may be permitted by law or this contract.

(e) Waiver. Requests for waiver under this clause shall be directed in writing to the Contracting Officer and shall include a full description of the requested waiver and the reasons in support thereof. If it is determined to be in the best interests of the Government, the Contracting Officer may grant such a waiver in writing.

(f) Subcontracts.

(1) The Contractor shall include a clause, substantially similar to this clause, including this paragraph (f), in subcontracts expected to exceed the simplified acquisition threshold determined in accordance with FAR Part 13 and involving the performance of advisory and assistance services as that term is defined at FAR 37.201. The terms "contract," "Contractor," and "Contracting Officer" shall be appropriately modified to preserve the Government's rights.

(2) Prior to the award under this contract of any subcontracts for advisory and assistance services, the Contractor shall obtain from the proposed subcontractor or consultant the disclosure required by DEAR 909.507-1, and shall determine in writing whether the interests disclosed present an actual or significant potential for an organizational conflict of interest. Where an actual or significant potential organizational conflict of interest is identified, the Contractor shall take actions to avoid, neutralize, or mitigate the organizational conflict to the satisfaction of the Contractor. If the conflict cannot be avoided or neutralized, the Contractor must obtain the approval of the DOE Contracting Officer prior to entering into the subcontract.

CLAUSE I.67 - DEAR 952.211-71 PRIORITIES AND ALLOCATIONS (DOMESTIC ENERGY SUPPLIES) (ALTERNATE I) (JUN 1996)

(a) This contract may be eligible for priorities and allocations support, as provided for by section 101(c) of the Defense Production Act of 1950, as amended by the Energy Policy and Conservation Act (Pub. L. 94-163, 42 U.S.C. 6201 et seq.) if its purpose is determined to be to maximize domestic energy supplies. Eligibility is dependent on an executive decision on a case-by-case basis with the decision being jointly made by the Departments of Energy and Commerce.

(b) DOE regulations regarding material allocations and priority performance under contracts or orders to maximize domestic energy supplies can be found at Part 216 of Title 10 of the Code of Federal Regulations (10 CFR Part 216).

(c) Additional guidance is provided by DOE Publication MA-0192, "Priorities and Allocations Support for Energy: Keeping Energy Programs on Schedule," dated August 1985, as it may from time to time be revised. Copies may be obtained by written request to: Department of Energy, Office of Scientific and Technical Information (OSTI), Post Office Box 62, Oak Ridge, Tennessee 37830.

CLAUSE I.68 - DEAR 952.211-71 PRIORITIES AND ALLOCATIONS (ATOMIC ENERGY) (JUN 1996)

The Contractor shall follow the provisions of Defense Priorities and Allocations System (DPAS) regulation (15 CFR Part 700) in obtaining controlled materials and other products and materials needed to fill this contract.

CLAUSE I.69 - DEAR 952.215-70 KEY PERSONNEL (DEC 2000)

(a) The personnel listed below or elsewhere in this contract are considered essential to the work being performed under this contract. Before removing, replacing, or diverting any of the listed or specified personnel, the Contractor must:

(1) Notify the Contracting Officer reasonably in advance;

(2) submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on this contract; and

(3) obtain the Contracting Officer's written approval.

Notwithstanding the foregoing, if the Contractor deems immediate removal or suspension of any member of its management team is necessary to fulfill its obligation to maintain satisfactory standards of employee competency, conduct,

and integrity under the clause at 48 CFR 970.5203-3, Contractor's Organization, the Contractor may remove or suspend such person at once, although the Contractor must notify Contracting Officer prior to or concurrently with such action.

(b) The list of personnel may, with the consent of the contracting parties, be amended from time to time during the course of the contract to add or delete personnel.

Dr. Ralph James	Gregory Fess, J.D.
Dr. Peter Paul	Dr. Thomas Kirk
Thomas Sheridan	Dr. Brian P. Sack
Michael Bebon	Leslie M. Hill
Margaret Lynch	
Dr. Nora D. Volkow	

CLAUSE I.70 - DEAR 952.217-70 ACQUISITION OF REAL PROPERTY (APR 1984)

(a) Notwithstanding any other provision of the contract, the prior approval of the Contracting Officer shall be obtained when, in performance of this contract, the Contractor acquires or proposes to acquire use of real property by:

(1) Purchase, on the Government's behalf or in the Contractor's own name, with title eventually vesting in the Government.

(2) Lease, and the Government assumes liability for, or will otherwise pay for the obligation under the lease as a reimbursable contract cost.

(3) Acquisition of temporary interest through easement, license or permit, and the Government funds the entire cost of the temporary interest.

(b) Justification of an execution of any real property acquisitions shall be in accordance and compliance with directions provided by the Contracting Officer.

(c) The substance of this Clause, including this paragraph (c), shall be included in any subcontract occasioned by this contract under which property described in paragraph (a) of this Clause shall be acquired.

CLAUSE I.71 - DEAR 952.223-75 PRESERVATION OF INDIVIDUAL OCCUPATIONAL RADIATION EXPOSURE RECORDS (APR 1984)

Individual occupational radiation exposure records generated in the performance of work under this contract shall be subject to inspection by DOE and shall be preserved by the

Contractor until disposal is authorized by DOE or at the option of the Contractor delivered to DOE upon completion or termination of the contract. If the Contractor exercises the foregoing option, title to such records shall vest in DOE upon delivery.

CLAUSE I.72 - DEAR 952.224-70 PAPERWORK REDUCTION ACT (APR 1994)

(a) In the event that it subsequently becomes a contractual requirement to collect or record information calling either for answer to identical questions from ten (10) or more persons other than Federal employees, or information from Federal employees which is to be used for statistical compilations of general public interest, the Federal Reports Act will apply to this contract. No plan, questionnaire, interview guide, or other similar device for collecting information (whether repetitive or single-time) may be used without first obtaining clearance from the Office of Management and Budget (OMB).

(b) The Contractor shall request the required OMB clearance from the Contracting Officer before expending any funds or making public contacts for the collection of data. The authority to expend funds and to proceed with the collection of data shall be, in writing, by the Contracting Officer. The Contractor must plan at least ninety (90) days for OMB clearance. Excessive delay caused by the Government which arises out of causes beyond the control and without the fault or negligence of the Contractor will be considered in accordance with the clause entitled "Excusable Delays", if such clause is applicable. If not, the period of performance may be extended pursuant to this Clause if approved by the Contracting Officer.

CLAUSE I.73 - DEAR 952.226-74 DISPLACED EMPLOYEE HIRING PREFERENCE (JUN 1997)

(a) Definition.

Eligible employee means a current or former employee of a Contractor or subcontractor employed at a Department of Energy Defense Nuclear Facility (1) whose position of employment has been, or will be, involuntarily terminated (except if terminated for cause), (2) who has also met the eligibility criteria contained in the Department of Energy guidance for Contractor work force restructuring, as may be amended or supplemented from time to time, and (3) who is qualified for a particular job vacancy with the Department or one of its Contractors with respect to work under its contract with the Department at the time the particular position is available.

(b) Consistent with Department of Energy guidance for Contractor work force restructuring, as may be amended or supplemented from time to time, the

Contractor agrees that it will provide a preference in hiring to an eligible employee to the extent practicable for work performed under this contract.

(c) The requirements of this clause shall be included in subcontracts at any tier (except for subcontracts for commercial items pursuant to 41 U.S.C. 403) expected to exceed $500,000.

CLAUSE I.73A - DEAR 952.227-82 RIGHTS TO PROPOSAL DATA (APR 1994)

Except for technical data contained on pages (none) of the Contractor's proposal dated September 8, 1997 which are asserted by the Contractor as being proprietary data, it is agreed that, as a condition of the award of this contract, and notwithstanding the provisions of any notice appearing on the proposal, the Government shall have the right to use, duplicate, disclose and have others do so for any purpose whatsoever, the technical data contained in the proposal upon which this contract is based.

CLAUSE I.74 - DEAR 952.250-70 NUCLEAR HAZARDS INDEMNITY AGREEMENT (JUN 1996)

(a) Authority. This clause is incorporated into this contract pursuant to the authority contained in subsection 170d. of the Atomic Energy Act of 1954, as amended (hereinafter called the Act.)

(b) Definitions. The definitions set out in the Act shall apply to this clause.

(c) Financial protection. Except as hereafter permitted or required in writing by DOE, the contractor will not be required to provide or maintain, and will not provide or maintain at Government expense, any form of financial protection to cover public liability, as described in paragraph (d)(2) below. DOE may, however, at any time require in writing that the contractor provide and maintain financial protection of such a type and in such amount as DOE shall determine to be appropriate to cover such public liability, provided that the costs of such financial protection are reimbursed to the contractor by DOE.

(d) (1) Indemnification. To the extent that the contractor and other persons indemnified are not compensated by any financial protection permitted or required by DOE, DOE will indemnify the contractor and other persons indemnified against (i) claims for public liability as described in subparagraph (d)(2) of this clause; and (ii) such legal costs of the contractor and other persons indemnified as are approved by DOE, provided that DOE's liability, including such legal costs, shall not exceed the amount set forth in section 170e.(1)(B) of the Act in the aggregate for

each nuclear incident or precautionary evacuation occurring within the United States or $100 million in the aggregate for each nuclear incident occurring outside the United States, irrespective of the number of persons indemnified in connection with this contract.

(2) The public liability referred to in subparagraph (d)(1) of this clause is public liability as defined in the Act which (i) arises out of or in connection with the activities under this contract, including transportation; and (ii) arises out of or results from a nuclear incident or precautionary evacuation, as those terms are defined in the Act.

(e) (1) Waiver of Defenses. In the event of a nuclear incident, as defined in the Act, arising out of nuclear waste activities, as defined in the Act, the contractor, on behalf of itself and other persons indemnified, agrees to waive any issue or defense as to charitable or governmental immunity.

(2) In the event of an extraordinary nuclear occurrence which:

(i) Arises out of, results from, or occurs in the course of the construction, possession, or operation of a production or utilization facility; or

(ii) Arises out of, results from, or occurs in the course of transportation of source material, by-product material, or special nuclear material to or from a production or utilization facility; or

(iii) Arises out of or results from the possession, operation, or use by the contractor or a subcontractor of a device utilizing special nuclear material or by-product material, during the course of the contract activity; or

(iv) Arises out of, results from, or occurs in the course of nuclear waste activities, the contractor, on behalf of itself and other persons indemnified, agrees to waive:

(A) Any issue or defense as to the conduct of the claimant (including the conduct of persons through whom the claimant derives its cause of action) or fault of persons indemnified, including, but not limited to:

1. Negligence;

2. Contributory negligence;

3. Assumption of risk; or

4. Unforeseeable intervening causes, whether involving the conduct of a third person or an act of God;

(B) Any issue or defense as to charitable or governmental immunity; and

(C) Any issue or defense based on any statute of limitations, if suit is instituted within 3 years from the date on which the claimant first knew, or reasonably could have known, of his injury or change and the cause thereof. The waiver of any such issue or defense shall be effective regardless of whether such issue or defense may otherwise be deemed jurisdictional or relating to an element in the cause of action. The waiver shall be judicially enforceable in accordance with its terms by the claimant against the person indemnified.

(v) The term extraordinary nuclear occurrence means an event which DOE has determined to be an extraordinary nuclear occurrence as defined in the Act. A determination of whether or not there has been an extraordinary nuclear occurrence will be made in accordance with the procedures in 10 CFR part 840.

(vi) For the purposes of that determination, "offsite" as that term is used in 10 CFR part 840 means away from "the contract location" which phrase means any DOE facility, installation, or site at which contractual activity under this contract is being carried on, and any contractor-owned or controlled facility, installation, or site at which the contractor is engaged in the performance of contractual activity under this contract.

(3) The waivers set forth above:

(i) Shall be effective regardless of whether such issue or defense may otherwise be deemed jurisdictional or relating to an element in the cause of action;

(ii) Shall be judicially enforceable in accordance with its terms by the claimant against the person indemnified;

(iii) Shall not preclude a defense based upon a failure to take reasonable steps to mitigate damages;

(iv) Shall not apply to injury or damage to a claimant or to a claimant's property which is intentionally sustained by the claimant or which

results from a nuclear incident intentionally and wrongfully caused by the claimant;

(v) Shall not apply to injury to a claimant who is employed at the site of and in connection with the activity where the extraordinary nuclear occurrence takes place, if benefits therefor are either payable or required to be provided under any workmen's compensation or occupational disease law;

(vi) Shall not apply to any claim resulting from a nuclear incident occurring outside the United States;

(vii) Shall be effective only with respect to those obligations set forth in this clause and in insurance policies, contracts or other proof of financial protection; and

(viii) Shall not apply to, or prejudice the prosecution or defense of, any claim or portion of claim which is not within the protection afforded under (A) the limit of liability provisions under subsection 170e. of the Act, and (B) the terms of this agreement and the terms of insurance policies, contracts, or other proof of financial protection.

(f) Notification and litigation of claims. The contractor shall give immediate written notice to DOE of any known action or claim filed or made against the contractor or other person indemnified for public liability as defined in paragraph (d)(2). Except as otherwise directed by DOE, the contractor shall furnish promptly to DOE, copies of all pertinent papers received by the contractor or filed with respect to such actions or claims. DOE shall have the right to, and may collaborate with, the contractor and any other person indemnified in the settlement or defense of any action or claim and shall have the right to (1) require the prior approval of DOE for the payment of any claim that DOE may be required to indemnify hereunder; and (2) appear through the Attorney General on behalf of the contractor or other person indemnified in any action brought upon any claim that DOE may be required to indemnify hereunder, take charge of such action, and settle or defend any such action. If the settlement or defense of any such action or claim is undertaken by DOE, the contractor or other person indemnified shall furnish all reasonable assistance in effecting a settlement or asserting a defense.

(g) Continuity of DOE obligations. The obligations of DOE under this clause shall not be affected by any failure on the part of the contractor to fulfill its obligation under this contract and shall be unaffected by the death, disability, or termination of existence of the contractor, or by the completion, termination or expiration of this contract.

(h) Effect of other clauses. The provisions of this clause shall not be limited in any way by, and shall be interpreted without reference to, any other clause of this contract, including the clause entitled Contract Disputes, provided, however, that this clause shall be subject to the clauses entitled Covenant Against Contingent Fees, and Accounts, Records, and Inspection, and any provisions that are later added to this contract as required by applicable Federal law, including statutes, executive orders and regulations, to be included in Nuclear Hazards Indemnity Agreements.

(i) Civil penalties. The Contractor and its subcontractors and suppliers who are indemnified under the provisions of this clause are subject to civil penalties, pursuant to 234A of the Act, for violations of applicable DOE nuclear-safety related rules, regulations, or orders.

(j) Criminal penalties. Any individual director, officer, or employee of the contractor or of its subcontractors and suppliers who are indemnified under the provisions of this clause are subject to criminal penalties, pursuant to 223(c) of the Act, for knowing and willful violation of the Atomic Energy Act of 1954, as amended, and applicable DOE nuclear safety-related rules, regulations or orders which violation results in, or, if undetected, would have resulted in a nuclear incident.

(k) Inclusion in subcontracts. The contractor shall insert this clause in any subcontract which may involve the risk of public liability, as that term is defined in the Act and further described in paragraph (d)(2) above. However, this clause shall not be included in subcontracts in which the subcontractor is subject to Nuclear Regulatory Commission (NRC) financial protection requirements under section 170b. of the Act or NRC agreements of indemnification under section 170c. or k. of the Act for the activities under the subcontract.

CLAUSE I.75 - DEAR 952.251-70 CONTRACTOR EMPLOYEE TRAVEL DISCOUNTS (DEC 2000)

(a) The contractor shall take advantage of travel discounts offered to Federal contractor employee travelers by AMTRAK, hotels, motels, or car rental companies, when use of such discounts would result in lower overall trip costs and the discounted services are reasonably available. Vendors providing these services may require the contractor employee to furnish them a letter of identification signed by the authorized contracting officer.

(b) Contracted airlines. Contractors are not eligible for GSA contract city pair fares.

(c) Discount rail service. AMTRAK voluntarily offers discounts to Federal travelers on official business and sometimes extends those discounts to Federal contractor employees.

(d) Hotels/motels. Many lodging providers extend their discount rates for Federal employees to Federal contractor employees.

(e) Car rentals. The Military Traffic Management Command (MTMC) of the Department of Defense negotiates rate agreements with car rental companies that are available to Federal travelers on official business. Some car rental companies extend those discounts to Federal contractor employees.

(f) Obtaining travel discounts.

(1) To determine which vendors offer discounts to Government contractors, the contractor may review commercial publications such as the Official Airline guides Official Traveler, Innovata, or National Telecommunications. The contractor may also obtain this information from GSA contract Travel Management Centers or the Department of Defense's Commercial Travel Offices.

(2) The vendor providing the service may require the Government contractor to furnish a letter signed by the contracting officer. The following illustrates a standard letter of identification.

OFFICIAL AGENCY LETTERHEAD

TO: Participating Vendor

SUBJECT: OFFICIAL TRAVEL OF GOVERNMENT CONTRACTOR

(FULL NAME OF TRAVELER), the bearer of this letter is an employee of (COMPANY NAME) which has a contract with this agency under Government contract (CONTRACT NUMBER). During the period of the contract (GIVE DATES), AND WITH THE APPROVAL OF THE CONTRACT VENDOR, the employee is eligible and authorized to use available travel discount rates in accordance with Government contracts and/or agreements. Government Contract City Pair fares are not available to Contractors.

SIGNATURE, Title and telephone number of Contracting Officer

CLAUSE I.76 - DEAR 970.5203-1 MANAGEMENT CONTROLS (DEC 2000)

(a) (1) The contractor shall be responsible for maintaining, as an integral part of its organization, effective systems of management controls for both administrative and programmatic functions. Management controls comprise the plan of organization, methods and procedures adopted by

management to reasonably ensure that: the mission and functions assigned to the contractor are properly executed; efficient and effective operations are promoted; resources are safeguarded against waste, loss, mismanagement, unauthorized use, or misappropriation; all encumbrances and costs that are incurred under the contract and fees that are earned are in compliance with applicable clauses and other current terms, conditions, and intended purposes; all collections accruing to the contractor in connection with the work under this contract, expenditures, and all other transactions and assets are properly recorded, managed, and reported; and financial, statistical, and other reports necessary to maintain accountability and managerial control are accurate, reliable, and timely.

(2) The systems of controls employed by the contractor shall be documented and satisfactory to DOE.

(3) Such systems shall be an integral part of the contractor's management functions, including defining specific roles and responsibilities for each level of management, and holding employees accountable for the adequacy of the management systems and controls in their areas of assigned responsibility.

(4) The contractor shall, as part of the internal audit program required elsewhere in this contract, periodically review the management systems and controls employed in programs and administrative areas to ensure that they are adequate to provide reasonable assurance that the objectives of the system are being accomplished and that these systems and controls are working effectively.

(b) The contractor shall be responsible for maintaining, as a part of its operational responsibilities, a baseline quality assurance program that implements documented performance, quality standards, and control and assessment techniques.

CLAUSE I.77 - DEAR 970.5203-2 PERFORMANCE IMPROVEMENT AND COLLABORATION (DEC 2000)

(a) The contractor agrees that it shall affirmatively identify, evaluate, and institute practices, where appropriate, that will improve performance in the areas of environmental and health, safety, scientific and technical, security, business and administrative, and any other areas of performance in the management and operation of the contract. This may entail the alteration of existing practices or the institution of new procedures to more effectively or efficiently perform any aspect of contract performance or reduce overall cost of operation under the contract. Such improvements may result from changes in organization,

simplification of systems while retaining necessary controls, or any other approaches consistent with the statement of work and performance measures of this contract.

(b) The contractor agrees to work collaboratively with the Department, all other management and operating, DOE major facilities management contractors and affiliated contractors which manage or operate DOE sites or facilities for the following purposes: (i) to exchange information generally, (ii) to evaluate concepts that may be of benefit in resolving common issues, in confronting common problems, or in reducing costs of operations, and (iii) to otherwise identify and implement DOE-complex-wide management improvements discussed in paragraph (a). In doing so, it shall also affirmatively provide information relating to its management improvements to such contractors, including lessons learned, subject to security considerations and the protection of data proprietary to third parties.

(c) The contractor may consult with the contracting officer in those instances in which improvements being considered pursuant to paragraph (a) involve the cooperation of the DOE. The contractor may request the assistance of the contracting officer in the communication of the success of improvements to other management and operating contractors in accordance with paragraph (b) of this clause.

(d) The contractor shall notify the contracting officer and seek approval where necessary to fulfill its obligations under the contract. Compliance with this clause in no way alters the obligations of the Contractor under any other provision of this contract.

CLAUSE I.78 - DEAR 970.5204-12 CONTRACTOR'S ORGANIZATION (JUL 1994) (DEVIATION)

(a) Organization chart. As promptly as possible after the execution of this contract, the Contractor shall furnish to the Contracting Officer a chart showing the names, duties, and organization of key personnel to be employed in connection with the work, and shall furnish from time to time supplementary information reflecting changes therein.

(b) Supervisory representative of Contractor. Unless otherwise directed by the Contracting Officer, a competent full-time resident supervisory representative of the Contractor satisfactory to the Contracting Officer shall be in charge of the work at the site at all times. This also applies to off-site work.

(c) (1) Control of employees. The Contractor shall be responsible for maintaining satisfactory standards of employee competency, conduct, and integrity

and shall be responsible for taking such disciplinary action with respect to his employees as may be necessary. The Contractor shall establish such standards and procedures as are necessary to implement effectively the provisions set forth in DEAR 970.0371 and FAR 3.502-2(i)(1) and (2), and such standards and procedures shall be subject to the approval of the Contracting Officer. In the event the Contractor fails to take significant disciplinary action, up to and including removal from the contract work, against any of its managerial personnel, as defined in Clause I.115 (j), who is/are responsible in whole or in part, whether by action or inaction, for the occurrence of a major event (e.g., fatality, hazardous material overexposure, loss of control over classified information or special nuclear materials or a significant uncontrolled release to the environment) relevant to the Contractor's ES&H responsibilities under this contract, the Government reserves the right, subject to the provision of subparagraph (2) below, to require the Contractor to take significant disciplinary action, up to and including removal of any of the managerial personnel involved from the contract work.

(2) Prior to exercising its right under subparagraph (1) to direct the Contractor to take significant disciplinary action against any of contractor's managerial personnel who is/are responsible in whole or in part, whether by action or inaction, for the occurrence of a major event, the DOE Brookhaven Area Office Manager will meet with a corporate officer of the Contractor and the Laboratory Director, as appropriate, to ascertain why the Contractor has determined not to take any significant disciplinary action against the managerial personnel involved. If after such meeting, the DOE Brookhaven Area Office Manager still believes significant disciplinary action should be taken against said employee(s), he shall forward such recommendation, along with any information provided by the Contractor for not taking such action to the Director, Office of Science. No action shall be taken by DOE to direct significant disciplinary action against any of Contractor's managerial personnel without the approval of the Director, Office of Science.

(3) Nothing in this paragraph (c) shall be construed as precluding DOE from taking any action it deems appropriate under the terms of this contract, up to and including termination pursuant to Clause I.55, vis-a-vis the Contractor if DOE determines that the Contractor, whether by action or inaction, is responsible in whole or in part for the occurrence of said major event.

CLAUSE I.78A – DEAR 970.5204-1 COUNTERINTELLIGENCE (DEC 2000)

(a) The contractor shall take all reasonable precautions in the work under this contract to protect DOE programs, facilities, technology, personnel, unclassified sensitive information and classified matter from foreign intelligence threats and activities conducted for governmental or industrial purposes, in accordance with DOE Order 5670.3, Counterintelligence Program; Executive Order 12333, U.S. Intelligence Activities; and other pertinent national and Department Counterintelligence requirements.

(b) The contractor shall appoint a qualified employee(s) to function as the Contractor Counterintelligence Officer. The Contractor Counterintelligence Officer will be responsible for conducting defensive Counterintelligence briefings and debriefings of employees traveling to foreign countries or interacting with foreign nationals; providing thoroughly documented written reports relative to targeting, suspicious activity and other matters of Counterintelligence interest; immediately reporting targeting, suspicious activity and other Counterintelligence concerns to the DOE Headquarters Counterintelligence Division; and providing assistance to other elements of the U.S. Intelligence Community as stated in the aforementioned Executive Order, the DOE Counterintelligence Order, and other pertinent national and Departmental Counterintelligence requirements.

CLAUSE I.79 - DEAR 970.5204-2 LAWS, REGULATIONS AND DOE DIRECTIVES (DEC 2000) (DEVIATION)

(a) In performing work under this contract, the contractor shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), unless relief has been granted in writing by the appropriate regulatory agency. A List of Applicable Laws and Regulations (Appendix I/List A) may be appended to this contract for information purposes. Omission of any applicable law or regulation from Appendix I/List A does not affect the obligation of the contractor to comply with such law or regulation pursuant to this paragraph.

(b) In performing work under this contract, the contractor shall comply with the requirements of those Department of Energy directives, or parts thereof, identified in the List of Applicable Directives (Appendix I/List B) appended to this contract. Except as otherwise provided for in paragraph (c) of this clause, the contracting officer may, from time to time and at any time, revise Appendix I/List B by unilateral modification to the contract to add, modify, or delete specific requirements. Prior to revising Appendix I/List B, the contracting officer shall notify the contractor in writing of the Department's intent to revise Appendix I/ListB and provide the contractor with the opportunity to assess the effect of the contractor's compliance with the revised list on contract cost and funding,

technical performance, and schedule; and identify any potential inconsistencies between the revised list and the other terms and conditions of the contract. Within 30 days after receipt of the contracting officer's notice, the contractor shall advise the contracting officer in writing of the potential impact of the contractor's compliance with the revised list. Based on the information provided by the contractor and any other information available, the contracting officer shall decide whether to revise Appendix I/List B and so advise the contractor not later than 30 days prior to the effective date of the revision of Appendix I/List B. The contractor and the contracting officer shall identify and, if appropriate, agree to any changes to other contract terms and conditions, including cost and schedule, associated with the revision of Appendix I/List B pursuant to the clause of this contract entitled, "Changes."

(c) Environmental, safety, and health (ES&H) requirements appropriate for work conducted under this contract may be determined by a DOE approved process to evaluate the work and the associated hazards and identify an appropriately tailored set of standards, practices, and controls, such as a tailoring process included in a DOE approved Safety Management System implemented under the clause entitled "Integration of Environment, Safety, and Health into Work Planning and Execution." When such a process is used, the set of tailored (ES&H) requirements, as approved by DOE pursuant to the process, shall be incorporated into Appendix I/List B as contract requirements with full force and effect. These requirements shall supersede, in whole or in part, the contractual environmental, safety, and health requirements previously made applicable to the contract by Appendix I/List B. If the tailored set of requirements identifies an alternative requirement varying from an ES&H requirement of an applicable law or regulation, the contractor shall request an exemption or other appropriate regulatory relief specified in the regulation.

(d) Except as otherwise directed by the contracting officer, the contractor shall procure all necessary permits or licenses required for the performance of work under this contract.

(e) Regardless of the performer of the work, the contractor is responsible for compliance with the requirements of this clause. The contractor is responsible for flowing down the requirements of this clause to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

CLAUSE I.80 - DEAR 970.5204-3 ACCESS TO AND OWNERSHIP OF RECORDS (DEC 2000)

(a) Government-owned records. Except as provided in paragraph (b) of this clause, all records acquired or generated by the contractor in its performance of this contract shall be the property of the Government and shall be delivered to the

Government or otherwise disposed of by the contractor either as the contracting officer may from time to time direct during the progress of the work or, in any event, as the contracting officer shall direct upon completion or termination of the contract.

(b) Contractor-owned records. The following records are considered the property of the contractor and are not within the scope of paragraph (a) of this clause.

(1) Employment-related records (such as workers' compensation files; employee relations records, records on salary and employee benefits; drug testing records, labor negotiation records; records on ethics, employee concerns, and other employee related investigations conducted under an expectation of confidentiality; employee assistance program records; and personnel and medical/health-related records and similar files), and non-employee patient medical/health related records, except for those records described by the contract as being maintained in Privacy Act systems of records.

(2) Confidential contractor financial information, and correspondence between the contractor and other segments of the contractor located away from the DOE facility (i.e., the contractor's corporate headquarters);

(3) Records relating to any procurement action by the contractor, except for records that under 48 CFR 970.5232-3, Accounts, Records, and Inspection, are described as the property of the Government; and

(4) Legal records, including legal opinions, litigation files, and documents covered by the attorney-client and attorney work product privileges; and

(5) The following categories of records maintained pursuant to the technology transfer clause of this contract:

(i) Executed license agreements, including exhibits or appendices containing information on royalties, royalty rates, other financial information, or commercialization plans, and all related documents, notes and correspondence.

(ii) The contractor's protected Cooperative Research and Development Agreement (CRADA) information and appendices to a CRADA that contain licensing terms and conditions, or royalty or royalty rate information.

(iii) Patent, copyright, mask work, and trademark application files and related contractor invention disclosures, documents and correspondence, where the contractor has elected rights or has

permission to assert rights and has not relinquished such rights or turned such rights over to the Government.

(c) Contract completion or termination. In the event of completion or termination of this contract, copies of any of the contractor-owned records identified in paragraph (b) of this clause, upon the request of the Government, shall be delivered to DOE or its designees, including successor contractors. Upon delivery, title to such records shall vest in DOE or its designees, and such records shall be protected in accordance with applicable federal laws (including the Privacy Act), as appropriate.

(d) Inspection, copying, and audit of records. All records acquired or generated by the contractor under this contract in the possession of the contractor, including those described at paragraph (b) of this clause, shall be subject to inspection, copying, and audit by the Government or its designees at all reasonable times, and the contractor shall afford the Government or its designees reasonable facilities for such inspection, copying, and audit; provided, however, that upon request by the contracting officer, the contractor shall deliver such records to a location specified by the contracting officer for inspection, copying, and audit. The Government or its designees shall use such records in accordance with applicable federal laws (including the Privacy Act), as appropriate.

(e) Applicability. Paragraphs (b), (c), and (d) of this clause apply to all records without regard to the date or origination of such records.

(f) Records retention standards. Special records retention standards, described at DOE Order 200.1, Information Management Program (version in effect on effective date of contract), are applicable for the classes of records described therein, whether or not the records are owned by the Government or the contractor. In addition, the contractor shall retain individual radiation exposure records generated in the performance of work under this contract until DOE authorizes disposal. The Government may waive application of these record retention schedules, if, upon termination or completion of the contract, the Government exercises its right under paragraph (c) of this clause to obtain copies and delivery of records described in paragraphs (a) and (b) of this clause.

(g) Subcontracts. The contractor shall include the requirements of this clause in all subcontracts that are of a cost-reimbursement type if any of the following factors is present:

(1) The value of the subcontract is greater than $2 million (unless specifically waived by the contracting officer);

(2) The contracting officer determines that the subcontract is, or involves, a critical task related to the contract; or

(3) The subcontract includes 48 CFR 970.5223-1, Integration of Environment, Safety, and Health into Work Planning and Execution, or similar clause.

CLAUSE I.80A - DEAR 970.5204-13 ALLOWABLE COSTS AND FEES (MANAGEMENT AND OPERATING CONTRACTS) (JUN 1997) (DEVIATION)

(a) Compensation for Contractor's Services. Payment for the allowable costs as hereinafter defined, and of the fee(s), if any, as hereinafter provided, shall constitute full and complete compensation for the performance of the work under this contract.

(b) Fee(s). The fixed fee payable to the Contractor for the performance of the work under this contract with respect to the period commencing when the Contractor assumed full responsibility for the Laboratory, to and including September 30, 1998 is $3,574,000.00. In addition, the Parties have agreed that the maximum amount that DOE will reimburse the Contractor for fees that are paid to Bechtel National, Inc., Waste Management Federal Services, Inc., and Duke Engineering and Services, Inc. for work through September 30, 1998 shall not exceed $1,085,000.00.

The performance fees earned by the Contractor for the performance of the work under this contract for the following periods are:

October 1, 1998 through and including September 30, 1999 - $6,608,000.00
October 1, 1999 through and including September 30, 2000 - $6,633,908.00
October 1, 2000 through and including September 30, 2001 - $6,583,492.00

The maximum performance fee earnable for the period October 1, 2001 through and including September 30, 2002, is $7,000,000.00 as determined by the procedures outlined in Appendix L – Computation of Fee.

The type of fee (fixed, award, incentive, as appropriate) and fee amounts payable to the Contractor for the performance of the work under this contract with respect to the period October 1, 2002, to and including January 4, 2003 is unspecified. As soon as practicable after October 1, 2002 , the Parties hereto shall negotiate an appropriate fee (fixed, award, incentive) and fee amount for the period October 1, 2002 to and including January 4, 2003. The Parties agree that these fee negotiations will be conducted in accordance with the DOE fee policies set forth in the Department of Energy Acquisition Regulations in effect at the time of the fee negotiations. Pending agreement upon such fee, the Contractor shall continue performance of the work under this contract and shall be paid a provisional fee at 75% of the amount paid for the previous period. There shall be no adjustment in the amount of the Contractor's fee by reason of differences

between any estimate of cost for performance of the work under this contract and the actual costs for performance of that work.

(c) Allowable Costs. The allowable cost of performing the work under this contract shall be the costs and expenses that are actually incurred by the Contractor in the performance of the contract work in accordance with its terms, that are necessary or incident thereto, and that are determined to be allowable as set forth in this paragraph. The determination of allowability of cost shall be based on:

(1) Allowability and reasonableness in accordance with FAR 31.201-2(d) and 31.201-3;

(2) Standards promulgated by the Cost Accounting Standards Board, if applicable; otherwise, generally accepted accounting principles and practices appropriate to the particular circumstances; and

(3) Recognition of all exclusions and limitations set forth in this clause or elsewhere in this contract as to types or amounts of items of cost. Allowable costs shall not include the cost of any item described as unallowable in paragraph (e) of this clause except as indicated therein. Failure to mention an item of cost specifically in paragraphs (d) or (e) of this clause shall not imply either that it is allowable or that it is unallowable.

(d) Examples of Items of Allowable Cost. Subject to the other provisions of this clause, the following examples of items of cost of work done under this contract shall be allowable to the extent indicated:

(1) Bonds and insurance, including self-insurance, as provided in the clause entitled, Insurance--Litigation and Claims.

(2) Communication costs, including telephone services, local and long-distance calls, telegrams, cablegrams, postage, and similar items.

(3) Consulting services (including legal and accounting), and related expenses, as approved by the Contracting Officer, except as made unallowable by paragraphs (e)(16) and (e)(26).

(4) Reasonable litigation and other legal expenses, including counsel fees, if incurred in accordance with the clause of the contract entitled, Insurance - Litigation and Claims, and the DOE approved contractor litigation management procedures (including cost guidelines) as such procedures may be revised from time to time, and if not otherwise made unallowable in this contract.

(5) Losses and expenses (including settlements made with the consent of the Contracting Officer) sustained by the Contractor, in the performance of this contract and certified, in writing, by the Contracting Officer to be reasonable, except the losses and expenses expressly made unallowable under other provisions of this contract. Such certification will not be unreasonably withheld.

(6) Materials, supplies, and equipment, including freight transportation, material handling, inspection, storage, salvage, and other usual expenses incident to the procurement, use and disposition thereof, subject to approvals required under other provisions of this contract.

(7) Patents, purchased design, license fees, and royalty payments to the extent expressly provided for under other provisions in this contract or as approved by the Contracting Officer, and preparation of invention disclosures, reports and related documents, and searching the art to the extent necessary to make such invention disclosures in accordance with Clause I.97 – DEAR 970.5227-10 - Patent Rights - Management and Operating Contracts, Nonprofit Organization or Small Business Firm Contractor, and the cost of DOE funded technology transfer in accordance with paragraph c., Allowable Costs, of Clause I.92 - DEAR 970.5227-3 - Technology Transfer Mission.

(8) Personnel costs and related expenses incurred in accordance with the personnel appendix (Appendix A) which is hereby incorporated by reference and made a part of this contract. It is specifically understood and agreed that said personnel appendix sets forth in detail personnel costs and related expenses to be allowable under this contract and is intended to document those personnel policies, practices and plans which have been found acceptable by the Contracting Officer. It is further understood and agreed that the Contractor will advise the Contracting Officer of any proposed changes in any matters covered by said policies, practices or plans which relate to this item of cost, and that the personnel appendix may be modified from time to time, in writing, by mutual agreement of the Contractor and Contracting Officer without execution of an amendment to this contract for the purpose of effectuating any such changes in, or additions to, said personnel appendix as may be agreed upon by the Parties. Such modifications shall be evidenced by execution of written numbered approval letters from the Contracting Officer or his representative. Types of personnel costs and related expenses to be incorporated into the personnel appendix, or amendments thereto, are as follows:

(i) Salaries and wages; bonuses and incentive compensation; overtime, shift differential, holiday, and other premium pay for time

worked; nonwork time, including vacations, holidays, sick, funeral, military, jury, witness, and voting leave; salaries and wages to employees in their capacity as union stewards and committeemen for time spent in handling grievances, or serving on labor management (Contractor) committees; provided, however, that the Contracting Officer's approval is required in each instance of total compensation to an individual employee at an annual rate of $80,000 or more, when it is proposed that a total of 50 percent or more of such compensation be reimbursed under DOE cost type contracts. Total compensation, as used herein, includes only the employee's base salary, bonus, and incentive compensation payments;

(ii) Legally required contributions to old-age and survivors' insurance, unemployment compensation plans, and workers compensation plans, (whether or not covered by insurance); voluntary or agreed-upon plans providing benefits for retirement, separation, life insurance, hospitalization, medical-surgical and unemployment (whether or not such plans are covered by insurance);

(iii) Travel (except foreign travel, which requires specific approval by the Contracting Officer on a case-by-case basis); incidental subsistence and other allowances of Contractor employees, in connection with performance of work under this contract (including new employees reporting for work and transfer of employees, the transfer of their household goods and effects and the travel and subsistence of their dependents);

(iv) Employee relations, welfare, morale, etc.; programs including incentive or suggestion awards; employee counseling services, health or first-aid clinics; house or employee publications; and wellness/fitness centers;

(v) Personnel training, (except special education and training courses and research assignments calling for attendance at educational institutions which require specific approval by the Contracting Officer on a case-by-case basis); including apprenticeship training programs designed to improve efficiency and productivity of contract operations, to develop needed skills, and to develop scientific and technical personnel in specialized fields required in the contract work;

(vi) Recruitment of personnel (including help-wanted advertisement), including service of employment agencies at rates not in excess of standard commercial rates, employment office, travel of prospective

employees at the request of the Contractor for employment interviews; and

(vii) Net cost of operating plant-site cafeteria, dining rooms, canteens, and lodging facilities, attributable to the performance of the contract.

(9) Repairs, maintenance, inspection, replacement, and disposal of Government-owned property and the restoration or clean-up of site and facilities to the extent approved by the Contracting Officer and as allowable under paragraph (f) of the clause of this contract entitled, Property.

(10) Subcontracts and purchase orders, including procurements from Contractor-controlled sources, subject to approvals required by other provisions of this contract.

(11) Subscriptions to trade, business, technical and professional periodicals, as approved by the Contracting Officer.

(12) Taxes, fees, and charges levied by public agencies which the Contractor is required by law to pay, except those which are expressly made unallowable under other provisions of this contract.

(13) Utility services, including electricity, gas, water and sewage.

(14) Indemnification of the Pension Benefit Guaranty Corporation, pursuant to the Employee Retirement Income Security Act of 1974, in accordance with FAR 31.205-6(j)(3)(iv).

(15) Establishment and maintenance of financial institution accounts in connection with the work hereunder, including, but not limited to, service charges, the cost of disbursing cash, necessary guards, cashiers, and paymasters. If payments to employees and visitors are made by check, facilities and arrangements for cashing checks may be provided without expense to the employees and visitors, subject to the approval of the Contracting Officer.

(16) Subject to the approval or ratification, in writing, of the Contracting Officer, litigation expenses (including reasonable counsel fees and the premium for bail bond) if incurred in accordance with the clause of the contract entitled, Insurance--Litigation and Claims necessary to defend adequately any member of the Contractor's internal guard force against whom a civil or criminal action is brought, where such action is based upon lawful act or acts of the guard undertaken by him in the general course of his duties for the purpose of accomplishing and fulfilling the official duties of his employment.

(17) Rentals and leases of land, buildings, and equipment owned by third parties, allowances in lieu of rental, charges associated therewith and costs of alteration, remodeling and restorations where such items are used in the performance of the contract, except that such rentals and leases directly chargeable to the contract shall be subject to such approval by the Contracting Officer as set forth in Appendix G.

(18) Stipends and payments made to reimburse travel or other expenses of faculty members, students and others who are not employed under this contract but are participating in research, educational or training activities under this contract to the extent such costs are incurred in connection with Contracting Officer approved fellowship, or other research, educational or training programs.

(19) Payments to educational institutions for tuition and fees or institutional allowances in connection with Contracting Officer approved fellowship or other research, educational or training programs.

(20) Expenditures by the Contractor to reimburse other employers for payments (including, but not limited to, salaries) to or for the benefit of their employees loaned to the Contractor for and engaged in the performance of the Contractor's undertaking hereunder.

(21) Costs incurred or expenditures made by the Contractor, as directed, approved or ratified by the Contracting Officer and not unallowable under any other provisions of this contract.

(22) Subject to any other limitations on allowability contained in this contract, including paragraph (e) below, costs incurred and expenditures made by the Contractor's Board of Directors, its members, committees, panels and support personnel in connection with performance of work under this contract.

(e) Examples of Items of Unallowable Costs. The following examples of items of costs are unallowable under this contract to the extent indicated:

(1) Advertising and public relations costs designed to promote the Contractor or its products, including the costs of promotional items and memorabilia such as models, gifts and souvenirs, and the cost of memberships in civic and community organizations; except those advertising and public relations costs:

(i) Specifically required by the contract;

(ii) Approved, in advance, by the Contracting Officer as clearly in furtherance of work performed under the contract;

(iii) That arise from requirements of the contract and that are exclusively for recruiting personnel, acquiring scarce items for contract performance, disposing of scrap or surplus materials, the transfer of Federally-owned or originated technology to State and local governments and to the private sector, or acquisition of contract-required supplies and services; or

(iv) Where the primary purpose of the activity is to facilitate contract performance in support of the DOE mission.

(2) Bad debts (including expenses of collection) and provisions for bad debts arising out of other business of the Contractor.

(3) Bidding expenses and cost of proposals except for such expenses and costs which are incurred pursuant to the provisions of the contract, including but not limited to Clause H.3 – DEAR 970.70 - Agreements to Perform Non-DOE Activities.

(4) Bonuses and similar compensation under any other name, which:

(i) Are not pursuant to an agreement between the Contractor and employee prior to the rendering of the services or an established plan consistently followed by the Contractor or,

(ii) Are in excess of those costs which are allowable by the Internal Revenue Code and regulations thereunder, or

(iii) Provide total compensation to an employee in excess of reasonable compensation for the services rendered.

(5) Central and branch office expenses of the Contractor, except as specifically set forth in the contract.

(6) Commissions, bonuses, and fees (under whatever name) in connection with obtaining or negotiating for a Government contract or a modification thereto, except when paid to bona fide employees or bona fide established selling organizations maintained by the Contractor for the purpose of obtaining Government business.

(7) Contingency reserves, provisions for.

(8) Contributions and donations, including cash, Contractor-owned property and services, regardless of the recipient.

(9) Depreciation in excess of that calculated by application of methods approved for use by the Internal Revenue Service under the Internal Revenue Code of 1954, as amended, including the straight-line declining balance (using a rate not exceeding twice the rate which would have been used had the depreciation been computed under the straight-line method), or sum-of-the-years digits method, on the basis of expected useful life, to the cost of acquisition of the related fixed assets less estimated salvage or residual value at the end of the expected useful life.

(10) Dividend provisions or payments and, in the case of sole proprietors and partners, distributions of profit.

(11) Entertainment, including costs of amusement, diversion, social activities; and directly associated costs such as tickets to shows or sports events, meals, lodging, rentals, transportation, and gratuities; costs of membership in any social, dining or country club or organization, except the costs of such recreational activities for on-site employees, as may be approved by the Contracting Officer or provided for elsewhere in the contract. Costs made specifically unallowable under this cost principle are not allowable under any other cost principle.

(12) Fines and penalties, except, with respect to civil fines and penalties only, if the Contractor demonstrates to the Contracting Officer that (i) Such a civil fine or penalty was incurred as a result of compliance with specific terms and conditions of the contract or written instructions from the Contracting Officer; or (ii) Such a civil fine or penalty was imposed without regard to fault and could not have been avoided by the exercise of due care.

(13) Government-furnished property, except to the extent that cash payment therefor is required pursuant to procedures of DOE applicable to transfers of such property to the Contractor from others.

(14) Insurance (including any provisions of a self-insurance reserve) on any person where the Contractor under the insurance policy is the beneficiary, directly or indirectly; insurance against loss of or damage to Government property as defined in Clause I.115, Property, except as authorized by the Contracting Officer; and insurance covering any cost which is unallowable under any provision of this contract.

(15) Interest, however represented (except (i) Interest incurred in compliance with other contract clauses including Clause I.99 – DEAR 970.5229-1 - State and Local Taxes, or (ii) imputed interest costs relating to leases

classified and accounted for as capital leases under generally accepted accounting principles (GAAP), provided that the decision to enter into a capital leasing arrangement has been specifically authorized and approved by the DOE in accordance with applicable procedures and such interest costs are recorded in an appropriately specified DOE account established for such purpose), bond discounts and expenses, and costs of financing and refinancing operations.

(16) Legal, accounting, and consulting services and related costs incurred in connection with the preparation and issuance of stock rights; organization or reorganization; prosecution or defense of antitrust suits; prosecution of claims against the United States; contesting actions or proposed actions of the United States; and prosecution or defense of patent infringement litigation (unless initiated at the request of DOE, or except where incurred pursuant to the Contractor's performance of the Government-funded technology transfer mission and in accordance with Clause I.98 - Insurance--Litigation and Claims).

(17) Losses or expenses:

(i) On, or arising from the sale, exchange, or abandonment of capital assets, including investments;

(ii) On other contracts, including the Contractor's contributed portion under cost-sharing contracts;

(iii) In connection with price reductions to and discount purchases by employees and others from any source;

(iv) That are compensated for by insurance or otherwise or which would have been compensated for by insurance required by law or by written direction of the Contracting Officer but which the Contractor failed to procure or maintain through its own fault or negligence;

(v) That result from willful misconduct or lack of good faith on the part of any of the Contractor's managerial personnel [as that term is defined in Clause I. 115 (j)];

(vi) That represent liabilities to third persons that are not allowable under the clause of this contract entitled, Insurance--Litigation and Claims; or

(vii) That represent liabilities to third persons for which the Contractor has expressly accepted responsibility under other terms of this contract.

(18) Maintenance, depreciation, and other costs incidental to the Contractor's idle or excess facilities (including machinery and equipment), other than reasonable standby facilities.

(19) Memberships in trade, business, and professional organizations, except as approved by the Contracting Officer.

(20) Precontract costs, except as expressly made allowable under other provisions in this contract.

(21) Independent Research and Development Costs excluding Laboratory Directed Research and Development or unless specifically provided for elsewhere in this contract.

(22) Selling costs, except to the extent they are determined to be reasonable and to be allocable to the contract. Allocability of selling costs to the contract will be determined in the light of reasonable benefit to the agency program arising from such activities as technical, consulting, demonstration, and other services performed for such purposes as applying or adapting the Contractor's product for agency use.

(23) Storage of records pertaining to this contract after completion of operations under this contract, irrespective of contractual or statutory requirement for the preservation of records.

(24) Taxes, fees, and charges in connection with financing, refinancing, or refunding operations, including listing of securities on exchanges, taxes which are paid contrary to Clause I.99 – DEAR 970.5229-1 - State and Local Taxes; Federal taxes on net income and excess profits; special assessments on land which represent capital improvement; and taxes on accumulated funding deficiencies of, or prohibited transactions involving, employee deferred compensation plans pursuant to Section 4971 or Section 4975 of the Internal Revenue Code of 1954, as amended, respectively.

(25) Travel expenses of the officers, proprietors, executives, administrative heads and other employees of the Contractor's central office or branch office organizations concerned with the general management, supervision, and conduct of the Contractor's business as a whole, except to the extent that particular travel is in connection with the contract and approved by the Contracting Officer.

(26) Salary or other compensation (and expenses related thereto) of any individual employed under this contract as a consultant or in another comparable employment capacity who is an employee of another

organization and concurrently performing work on a full-time annual basis for that organization under a cost-type contract with DOE, except to the extent that cash payment therefor is required pursuant to the provisions of this contract or procedure of DOE applicable to the borrowing of such an individual from another cost-type Contractor.

(27) Travel by commercial aircraft or travel by other than common carrier that is not necessary for the performance of this contract or the cost of which exceeds the lesser of the lowest available commercial discount airfare, Government contract airfare, or customary standard (coach or equivalent) commercial airfare. Airfare costs in excess of the lowest such airfare are unallowable, except when such accommodations:

(i) Require circuitous routing;

(ii) Require travel during unreasonable hours;

(iii) Excessively prolong travel;

(iv) Result in increased cost that would offset transportation savings;

(v) Would offer accommodations not reasonably adequate for the physical or medical needs of the traveler; or

(vi) Are not reasonably available to meet necessary mission requirements.

Individual Contractor determinations of nonavailability of commercial discount airfare or Government contract airfare will not be contested by DOE when the Contractor can reasonably demonstrate such nonavailability or, on an overall basis, that established policies and procedures result in the routine use of the lowest available airfare. However, in order for air travel costs in excess of customary standard airfare to be allowable, the Contractor must justify and document the applicable condition(s) set forth above.

(28) Special construction industry "funds" financed by employer contributions for such purposes as methods and materials research, public and industry relations, market development, and disaster relief, except as specifically provided elsewhere in this contract.

(29) Late premium payment charges related to employee deferred compensation plan insurance.

(30) Facilities capital cost of money. (CAS 414 and CAS 417).

(31) Contractor costs incurred to influence either directly or indirectly --

(i) Legislative actions on any matter pending before Congress, a State legislature, or a local legislature; or

(ii) Federal, State, or local executive branch action on regulatory and contract matters, other than costs incurred in regard to contract proposals, as described in the "Legislative Lobbying Cost Prohibition" clause of this contract.

(32) Commercial automobile rental expenses, unless approved by the Contracting Officer or authorized by Appendix A.

(33) Costs incurred in connection with any criminal, civil or administrative proceeding commenced by the Federal Government or a State, local or foreign government, as provided in the Clause entitled, "Cost Prohibitions Related to Legal and Other Proceedings", incorporated elsewhere in this contract.

(34) Costs of alcoholic beverages.

(35) Contractor employee travel costs incurred for lodging, meals and incidental expenses which are not in accordance with Appendix A.

(36) Premium Pay for wearing radiation-measuring devices for Laboratory and all-tier cost-type subcontract employees.

(37) Costs incurred in connection with any employee action, as provided in Clause H.4 - Costs Associated with Whistleblower Actions.

(38) Notwithstanding any other provision of this contract, the costs of bonds and insurance are unallowable to the extent they are incurred to protect and indemnify the Contractor and/or subcontractor against otherwise unallowable costs, unless such insurance or bond is required by law, the express terms of this contract, or is authorized in writing by the Contracting Officer. The cost of commercial insurance to protect the Contractor against the costs of correcting its own defects in materials or workmanship is an unallowable cost.

(39) Costs of gifts; however, gifts do not include awards for performance or awards made in recognition of employee achievements pursuant to an established Contractor plan or policy.

(40) The costs of recreation, except for the costs of employees' participation in company sponsored sports teams or employee organizations designed to improve company loyalty, team work, or physical fitness.

(41) Salaries or other compensation of the Contractor's Board members, or that of members of subcommittees of the Board who are employees of the Contractor, Battelle Memorial Institute, the Research Foundation of State University of New York, State University of New York at Stony Brook and the six Core Universities.

CLAUSE I.80B - DEAR 970.5204-17 (AL 96-03) LEGISLATIVE LOBBYING COST PROHIBITION (JAN 1996)(MODIFIED)

(a) Pursuant to the allowable cost provisions established elsewhere under the contract, costs associated with the following activities are not reimbursable under the contract:

(1) Attempts to influence the outcome of any Federal, State, or local election, referendum, initiative, or similar procedure, through in-kind or cash contributions, endorsements, publicity, or similar activities;

(2) Establishing, administering, contributing to, or paying the expenses of a political party, campaign, political action committee, or other organization established for the purpose of influencing the outcomes of elections;

(3) Any attempt to influence (i) the introduction of Federal or State legislation, or (ii) the enactment or modification of any pending Federal or State legislation through communication with any member or employee of the Congress or State legislature (including efforts to influence state or local officials to engage in similar lobbying activity), or with any Government official or employee in connection with a decision to sign or veto enrolled legislation;

(4) Any attempt to influence (i) the introduction of Federal or State legislation, or (ii) the enactment or modification of any pending Federal or State legislation by preparing, distributing or using publicity or propaganda, or by urging members of the general public or any segment thereof to contribute to or participate in any mass demonstration, march, rally, fund raising drive, lobbying campaign or letter writing or telephone campaign; or

(5) Legislative liaison activities, including attendance at legislative sessions or committee hearings, gathering information regarding legislation, and analyzing the effect of legislation, when such activities are carried on in

support of or in knowing preparation for an effort to engage in unallowable activities.

(6) Contractor costs incurred to influence (directly or indirectly) Federal, State, or local executive branch actions on regulatory and contract matters, other than costs incurred in regard to contract proposals.

(b) Costs of the following activities are excepted from the coverage of paragraph (a) of this clause; provided that the resultant contract costs are reasonable and otherwise comply with the allowable cost provisions of the contract:

(1) Providing Members of Congress, their staff members or staff of cognizant legislative committees, in response to a request (written or oral, prior or contemporaneous) from Members of Congress, their staff members or staff of cognizant legislative committees, or as otherwise directed by the Contracting Officer, information or expert advice of a factual, technical, or scientific nature, with respect to topics directly related to the performance of the contract or proposed legislation. In providing this information or expert advice, the Contractor shall indicate to the recipient that it is not presenting the views of DOE. Reasonable costs for transportation, lodging or meals incurred by Contractor employees for the purpose of providing such information or expert advice shall also be reimbursable; provided the request for such information or expert advice is a prior written request signed by a Member of Congress, and provided such costs also comply with the allowable cost provisions of the contract.

(2) Providing State legislatures or subdivisions thereof, their staff members, or staff of cognizant legislative committees, in response to a prior written request from a State legislator, or as otherwise directed by the Contracting Officer, information or expert advice of factual, technical, or scientific nature, with respect to topics directly related to the performance of the contract or proposed legislation. In providing this information or expert advice, the Contractor shall indicate to the recipient that it is not presenting the views of DOE. Reasonable costs for transportation, lodging, or meals incurred by Contractor employees shall be reimbursable, provided such costs also comply with the allowable costs provision of the contract.

(3) Any lobbying made unallowable under subparagraph (a)(3) above to influence State legislation in order to directly reduce contract cost, or to avoid material impairment of the Contractor's authority to perform the contract if authorized by the Contracting Officer.

(4) Any activity specifically authorized by statute to be undertaken with funds from the contract.

(c) Unallowable lobbying costs incurred, if any, shall not be charged to DOE, paid for with DOE funds or recorded as allowable cost in DOE's system of accounts.

(d) The Contractor's annual certification submitted as part of its annual claim (i.e., Voucher Accounting for Net Expenditures Accrued required under the clause entitled "Payments and Advances") or cost incurred statement, that the costs claimed are allowable under the contract, shall also serve as the Contractor's certification that the requirements and standards of this clause have been complied with.

(e) The Contractor shall maintain adequate records to demonstrate that the annual certifications of claimed costs as being allowable comply with the requirements of this clause.

(f) Time logs, calendars, or similar records shall not be created for purposes of complying with this clause during any particular calendar month when: (1) An employee engages in legislative liaison activities (as delineated in paragraphs (a) and (b) of this clause) 25 percent or less of the employee's compensated hours of employment during that calendar month, and (2) within the preceding five-year period, the Contractor has not materially misstated allowable or unallowable costs of any nature, including legislative liaison costs. When conditions (f)(1) and (2) of this clause are met, the Contractor is not required to establish records to support the allowability of claimed costs in addition to records already required or maintained. Also, when conditions (f)(1) and (2) of this Clause are met, the absence of time logs, calendars, or similar records will not serve as a basis for disallowing costs by contesting estimates of legislative liaison activity time spent by employees during any calendar month.

(g) During contract performance, the Contractor should resolve, in advance, any significant questions or disagreements between the Contractor and DOE concerning compliance with this clause.

(h) In providing information or expert advice under paragraph (b)(1) and (b)(2) of this clause, the Contractor shall advise the Contracting Officer in advance or as soon as practicable.

CLAUSE I.80C - DEAR 970.5204-27(b) CONSULTANT OR OTHER COMPARABLE EMPLOYMENT SERVICES (MAY 1989)

The Contractor shall require all employees who are employed full-time (an individual who performs work under the cost-type contract on a full-time annual basis) or part-time (50 percent or more of regular annual compensation received under terms of a contract with DOE) on the contract work to disclose to the Contractor all consultant or other comparable employment services which the employees propose to undertake for others.

The Contractor shall transmit to the Contracting Officer all information obtained from such disclosures. The Contractor will require any employee who will be employed full-time on the contract work to agree, as a condition of his participation in such work, that he will not perform consultant or other comparable employment services for another DOE Contractor in the same or related energy field or another organization except with the prior approval of the Contractor. If the Contractor believes, with respect to any employee who is employed full-time on the contract work, that any proposed consultant or other comparable employment service may involve:

(1) a rate of remuneration significantly in excess of the employee's regular rate of remuneration;

(2) a significant question concerning possible conflict with DOE's policies regarding conduct of employees of DOE's Contractors;

(3) the Contractor's responsibility to report fully and promptly to DOE all significant research and development information; or

(4) the patent provisions of the Contractor's contract with DOE,

the Contractor shall obtain the prior approval of the Contracting Officer for such consultant or other comparable employment service.

CLAUSE I.80D - DEAR 970.5204-61 COST PROHIBITIONS RELATED TO LEGAL AND OTHER PROCEEDINGS (JUN 1997)

(a) Definitions.

Conviction, as used in this section, means a judgment or conviction of a criminal offense by any court of competent jurisdiction, whether entered upon a verdict or a plea, including a conviction due to a plea of nolo contendere.

Costs include, but are not limited to, administrative and clerical expenses; the cost of legal services, whether performed by in-house or private counsel; the costs of the services of accountants, consultants, or others retained by the Contractor to assist it; all elements of compensation, related costs, and expenses of employees, officers and directors; and any similar costs incurred before, during, and after commencement of a proceeding which bears a direct relationship to the proceeding.

Fraud, as used herein, means --

(i) Acts of fraud or corruption or attempts to defraud the Government or to corrupt its agents,

(ii) Acts which constitute a cause for debarment or suspension under FAR 9.406-(2)(a) and FAR 9.407-(2)(a), and

(iii) Acts which violate the False Claims Act, 31 U.S.C. 3729-3731, or the Anti-kickback Act, 41 U.S.C. 51 and 54.

Penalty does not include restitution, reimbursement, or compensatory damages.

Proceeding includes an investigation.

(b) Except as otherwise described in this section, costs incurred in connection with any proceeding brought by a third party in the name of the United States under the False Claims Act, 31 U.S.C. 3730, or costs incurred in connection with any criminal, civil or administrative proceeding by the Federal Government, or a State, local or foreign government, are not allowable if the proceeding relates to a violation of, or failure to comply with a Federal, State, local or foreign statute or regulation by the Contractor, and results in any of the following dispositions:

(1) In a criminal proceeding, conviction.

(2) In a civil or administrative proceeding involving an allegation of fraud or similar misconduct, a determination of Contractor liability.

(3) In the case of any civil or administrative proceeding, the imposition of a monetary penalty.

(4) A final decision by an appropriate Federal official to debar or suspend the Contractor, to rescind or void a contract, or to terminate a contract for default by reason of a violation of or failure to comply with a law or regulation.

(5) A disposition by consent or compromise, if the action could have resulted in any of the dispositions described in paragraphs (b)(1), (2), (3) or (4) of this section.

(6) Not covered by paragraphs (b)(1) through (5) of this section, but where the underlying alleged Contractor misconduct was the same as that which led to a different proceeding whose costs are unallowable by reason of paragraphs (b)(1) through (5) of this section.

(c) (1) If a proceeding referred to in paragraph (b) of this section is commenced by the Federal Government and is resolved by consent or compromise pursuant to an agreement entered into by the Contractor and the Federal Government, then the costs incurred by the Contractor in connection with such proceeding that are otherwise unallowable under paragraph (b) of

this section may be allowed to the extent specifically provided in such agreement.

(2) In the event of a settlement of any proceeding brought by a third party under the False Claims Act in which the United States did not intervene, reasonable costs incurred by the Contractor in connection with such a proceeding that are not otherwise unallowable by regulation or by separate agreement with the United States, may be allowed if the Contracting Officer, in consultation with his or her legal advisor, determines that there was very little likelihood that the third party would have been successful on the merits.

(d) If a proceeding referred to in paragraph (b) of this section is commenced by a State, local or foreign government, the Contracting Officer may allow the costs incurred in such proceeding, provided the Procurement Executive determines that the costs were incurred as a result of compliance with a specific term or condition of the contract, or specific written direction of the Contracting Officer.

(e) Costs incurred in connection with a proceeding described in paragraph (b) of this section, but which are not made unallowable by that paragraph, may be allowed by the Contracting Officer only to the extent that:

(1) The total costs incurred are reasonable in relation to the activities required to deal with the proceeding and the underlying cause of action;

(2) Payment of the costs incurred, as allowable and allocable contract costs, is not prohibited by any other provision(s) of this contract;

(3) The costs are not otherwise recovered from the Federal Government or a third party, either directly as a result of the proceeding or otherwise; and

(4) The amount of costs allowed does not exceed 80 percent of the total costs incurred and otherwise allowable under the contract. Such amount that may be allowed (up to the 80 percent limit) shall not exceed the percentage determined by the Contracting Officer to be appropriate, considering the complexity of procurement litigation, generally accepted principles governing the award of legal fees in civil actions involving the United States as a party, and such other factors as may be appropriate. The amount of reimbursement allowed for legal costs in connection with any proceeding described in subparagraph (c)(2) shall be the amount determined to be reasonable by the Contracting Officer but shall not exceed 80 percent of otherwise allowable costs incurred. Agreements reached under paragraph (c) of this subsection shall be subject to this limitation. If, however, an agreement explicitly states the amount of otherwise allowable incurred legal fees and limits the allowable recovery to

80 percent or less of the stated legal fees, no additional limitation need be applied.

(f) Contractor costs incurred in connection with the defense of suits brought by employees or ex-employees of the Contractor under Section 2 of the Major Fraud Act of 1988, including the cost of all relief necessary to make such employee whole, where the Contractor was found liable or settled, are unallowable.

(g) Costs which may be unallowable under this clause, including directly associated costs, shall be differentiated and accounted for by the Contractor so as to be separately identifiable. During the pendency of any proceeding covered by paragraphs (b) and (f) of this section, the Contracting Officer shall generally withhold payment and not authorize the use of funds advanced under the contract for the payment of such costs. However, the Contracting Officer may, in appropriate circumstances, provide for conditional payment upon provision of adequate security, or other adequate assurance, and agreements by the Contractor to repay all unallowable costs, plus interest, if the costs are subsequently determined to be unallowable.

CLAUSE I.81 - DEAR 970.5208-1 PRINTING (DEC 2000)

(a) To the extent that duplicating or printing services may be required in the performance of this contract, the Contractor shall provide or secure such services in accordance with the Government Printing and Binding Regulations, Title 44 of the U.S. Code, and DOE Directives relative thereto.

(b) The term "Printing" includes the following processes: composition, platemaking, presswork, binding, microform publishing, or the end items produced by such processes. Provided, however, that performance of a requirement under this contract involving the duplication of less than 5,000 copies of a single page, or no more than 25,000 units in the aggregate of multiple pages, will not be deemed to be printing.

(c) Printing services not obtained in compliance with this guidance shall result in the cost of such printing being disallowed.

(d) The Contractor shall include the substance of this clause in all subcontracts hereunder which require printing (as that term is defined in Title I of the U.S. Government Printing and Binding Regulations).

CLAUSE I.81A - DEAR 970.5215-1 TOTAL AVAILABLE FEE: BASE FEE AMOUNT AND PERFORMANCE FEE AMOUNT (DEC 2000) (ALTERNATES II AND III) (DEC 2000)

(a) *Total available fee.* Total available fee, consisting of a base fee amount (which may be zero) and a performance fee amount (consisting of an incentive fee component for objective performance requirements, an award fee component for subjective performance requirements, or both) determined in accordance with the provisions of this clause, is available for payment in accordance with the clause of this contract entitled, "Payments and advances."

(b) *Fee Negotiations.* Prior to the beginning of each fiscal year under this contract, or other appropriate period as mutually agreed upon and, if exceeding one year, approved by the Senior Procurement Executive, or designee, the contracting officer and Contractor shall enter into negotiation of the requirements for the year or appropriate period, including the evaluation areas and individual requirements subject to incentives, the total available fee, and the allocation of fee. The contracting officer shall modify this contract at the conclusion of each negotiation to reflect the negotiated requirements, evaluation areas and individual requirements subject to incentives, the total available fee, and the allocation of fee. In the event the parties fail to agree on the requirements, the evaluation areas and individual requirements subject to incentives, the total available fee, or the allocation of fee, a unilateral determination will be made by the contracting officer. The total available fee amount shall be allocated to a twelve month cycle composed of one or more evaluation periods, or such longer period as may be mutually agreed to between the parties and approved by the Senior Procurement Executive, or designee.

(c) *Determination of Total Available Fee Amount Earned.*

(1) The Government shall, at the conclusion of each specified evaluation period, evaluate the contractor's performance of all requirements, including performance based incentives completed during the period, and determine the total available fee amount earned. At the contracting officer's discretion, evaluation of incentivized performance may occur at the scheduled completion of specific incentivized requirements.

(2) The DOE Operations/Field Office Manager, or designee, will be the Manager, Brookhaven Area Office. The contractor agrees that the determination as to the total available fee earned is a unilateral determination made by the DOE Operations/Field Office Manager, or designee.

(3) The evaluation of contractor performance shall be in accordance with the Performance Evaluation and Measurement Plan(s) described in

subparagraph (d) of this clause unless otherwise set forth in the contract. The Contractor shall be promptly advised in writing of the fee determination, and the basis of the fee determination. In the event that the contractor's performance is considered to be less than the level of performance set forth in the Statement of Work, as amended to include the current Work Authorization Directive or similar document, for any contract requirement, it will be considered by the DOE Operations/Field Office Manager, or designee, who may at his/her discretion adjust the fee determination to reflect such performance. Any such adjustment shall be in accordance with the clause entitled, "Conditional Payment of Fee, Profit, or Incentives" if contained in the contract.

(4) Award fee not earned during the evaluation period shall not be allocated to future evaluation periods.

(d) *Performance Evaluation and Measurement Plan(s).* To the extent not set forth elsewhere in the contract:

(1) The Government shall establish a Performance Evaluation and Measurement Plan(s) upon which the determination of the total available fee amount earned shall be based. The Performance Evaluation and Measurement Plan(s) will address all of the requirements of contract performance specified in the contract directly or by reference. A copy of the Performance Evaluation and Measurement Plan(s) shall be provided to the Contractor:

(i) prior to the start of an evaluation period if the requirements, evaluation areas, specific incentives, amount of fee, and allocation of fee to such evaluation areas and specific incentives have been mutually agreed to by the parties; or

(ii) not later than thirty days prior to the scheduled start date of the evaluation period, if the requirements, evaluation areas, specific incentives, amount of fee, and allocation of fee to such evaluation areas and specific incentives have been unilaterally established by the contracting officer.

(2) The Performance Evaluation and Measurement Plan(s) will set forth the criteria upon which the Contractor will be evaluated relating to any technical, schedule, management, and/or cost objectives selected for evaluation. Such criteria should be objective, but may also include subjective criteria. The Plan(s) shall also set forth the method by which the total available fee amount will be allocated and the amount earned determined.

(3) The Performance Evaluation and Measurement Plan(s) may, consistent with the contract statement of work, be revised during the period of performance. The contracting officer shall notify the contractor:

(i) of such unilateral changes at least ninety calendar days prior to the end of the affected evaluation period and at least thirty calendar days prior to the effective date of the change;

(ii) of such bilateral changes at least sixty calendar days prior to the end of the affected evaluation period; or

(iii) if such change, whether unilateral or bilateral, is urgent and high priority, at least thirty calendar days prior to the end of the evaluation period.

(e) *Schedule for total available fee amount earned determinations.* The DOE Operations/Field Office Manager, or designee, shall issue the final total available fee amount earned determination in accordance with: the schedule set forth in the Performance Evaluation and Measurement Plan(s); or as otherwise set forth in this contract . However, a determination must be made within sixty calendar days after the receipt by the contracting officer of the Contractor's self-assessment, if one is required or permitted by paragraph (f) of this clause, or seventy calendar days after the end of the evaluation period, whichever is later, or a longer period if the Contractor and contracting officer agree. If the contracting officer evaluates the Contractor's performance of specific requirements on their completion, the payment of any earned fee amount must be made within seventy calendar days (or such other time period as mutually agreed to between the contracting officer and the Contractor) after such completion. If the determination is delayed beyond that date, the Contractor shall be entitled to interest on the determined total available fee amount earned at the rate established by the Secretary of the Treasury under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the payment date. This rate is referred to as the "Renegotiation Board Interest Rate," and is published in the Federal Register semiannually on or about January 1 and July 1. The interest on any late total available fee amount earned determination will accrue daily and be compounded in 30-day increments inclusive from the first day after the schedule determination date through the actual date the determination is issued. That is, interest accrued at the end of any 30-day period will be added to the determined amount of fee earned and be subject to interest if not paid in the succeeding 30-day period.

(f) *Contractor self-assessment.* Following each evaluation period, the Contractor shall submit a self-assessment within 45 calendar days after the end of the period. This self-assessment shall address both the strengths and weaknesses of the Contractor's performance during the evaluation period. Where deficiencies

in performance are noted, the Contractor shall describe the actions planned or taken to correct such deficiencies and avoid their recurrence. The DOE Operations/Field Office Manager, or designee, will review the Contractor's self-assessment, if submitted, as part of its independent evaluation of the contractor's management during the period. A self-assessment, in and of itself may not be the only basis for the award fee determination.

CLAUSE I.82 - DEAR 970.5215-2 MAKE OR BUY PLAN (DEC 2000)

(a) Definitions.

Buy item means a work activity, supply, or service to be produced or performed by an outside source, including a subcontractor or an affiliate, subsidiary, or division of the contractor.

Make item means a work activity, supply, or service to be produced or performed by the contractor using its personnel and other resources at the Department of Energy facility or site.

Make-or-Buy plan means a contractor's written program for the contract that identifies work efforts or requirements that either are "make items" or "buy items."

(b) Make-or-Buy Plan. The contractor shall develop and implement a Make-or-Buy Plan that establishes a preference for providing supplies and services on a least-cost basis, subject to any specific make or buy criteria identified in the contract or otherwise provided by the contracting officer. In developing and implementing its Make-or-Buy Plan, the contractor agrees to assess subcontracting opportunities and implement subcontracting decisions in accordance with the following:

(1) The Contractor shall conduct internal productivity improvement and cost-reduction programs so that in-house performance options can be made more efficient and cost-effective.

(2) The Contractor shall consider subcontracting opportunities with the maximum practicable regard for open communications with potentially affected employees and their representatives. Similarly, a Contractor shall communicate its plans, activities, cost-benefit analyses, and decisions to those stakeholders, including representatives of the community and local businesses, likely to be affected by such actions.

(c) Submission and approval. For new contract awards, the Contractor shall submit an initial make-or-buy plan, for approval, within 180 days after the contract award. If the existing contract is to be extended, the Contractor shall submit a Make-or-Buy Plan for review and approval at least 90 days prior to the commencement of

the negotiations for the extension. The following documentation shall be prepared and submitted:

(1) A description of each work item, and if appropriate, the identification of the associated Work Authorization or Work Breakdown Structure element;

(2) The categorization of each work item as "must make," "must buy," or "can make or buy," with the reasons for such categorization in consideration of the program specific make or buy criteria (including least cost considerations). For non-core capabilities categorized as "must make", a cost/benefit analysis must be performed for each item if:

(i) the Contractor is not the least-cost performer, and

(ii) a program specific make-or-buy criterion does not otherwise justify a "must make" categorization;

(3) A decision to either "make" or "buy" in consideration of the program specific make or buy criteria (including least cost considerations) for work effort categorized as "can make or buy";

(4) Identification of potential suppliers and subcontractors, if known, and their location and size status;

(5) A recommendation to defer a make or buy decision where categorization of an identifiable work effort is impracticable at the time of initial development of the plan and a schedule for future re-evaluation;

(6) A description of the impact of a change in current practice of making or buying on the existing work force; and

(7) Any additional information appropriate to support and explain the plan.

(d) Conduct of operations. Once a make-or-buy plan is approved, the Contractor shall perform in accordance with the plan. The make-or-buy plan is attached hereto as Appendix E.

(e) Changes to the make-or-buy plan. The make-or-buy plan established in accordance with paragraph (b) of this clause shall remain in effect for the term of the contract, unless:

(1) A lesser period is provided either for the total plan or for individual items or work effort;

(2) The circumstances supporting the make-or-buy decisions change, or

(3) New work is identified.

At least annually, the Contractor shall review its approved make-or-buy plan to ensure that it reflects current conditions. Changes to the approved make-or-buy plan shall be submitted in advance of the effective date of the proposed change in sufficient time to permit evaluation and review. Changes shall be submitted in accordance with the instructions provided by the Contracting Officer. Modification of the make-or-buy plan to incorporate proposed changes or additions shall be effective upon the Contractor's receipt of the Contracting Officer's written approval.

CLAUSE I.83 - RESERVED

CLAUSE I.84 - DEAR 970.5222-1 COLLECTIVE BARGAINING AGREEMENTS -- MANAGEMENT AND OPERATING CONTRACTS (DEC 2000)

When negotiating collective bargaining agreements applicable to the work force under this contract, the Contractor shall use its best efforts to ensure such agreements contain provisions designed to assure continuity of services. All such agreements entered into during the contract period of performance should provide that grievances and disputes involving the interpretation or application of the agreement will be settled without resorting to strike, lockout, or other interruption of normal operations. For this purpose, each collective bargaining agreement should provide an effective grievance procedure with arbitration as its final step, unless the parties mutually agree upon some other method of assuring continuity of operations. As part of such agreements, management and labor should agree to cooperate fully with the Federal Mediation and Conciliation Service. The contractor shall include the substance of this clause in any subcontracts for protective services or other services performed on the DOE-owned site which will affect the continuity of operation of the facility.

CLAUSE I.85 - DEAR 970.5222-2 OVERTIME MANAGEMENT (DEC 2000)

(a) The Contractor shall maintain adequate internal controls to ensure that employee overtime is authorized only if cost effective and necessary to ensure performance of work under this contract.

(b) The Contractor shall notify the Contracting Officer when in any given year it is likely that overtime usage as a percentage of payroll may exceed 4%.

(c) The Contracting Officer may require the submission, for approval, of a formal annual overtime control plan whenever Contractor overtime usage as a percentage of payroll has exceeded, or is likely to exceed, 4%, or if the

Contracting Officer otherwise deems overtime expenditures excessive. The plan shall include, at a minimum:

(1) An overtime premium fund (maximum dollar amount);

(2) Specific controls for casual overtime for non-exempt employees;

(3) Specific parameters for allowability of exempt overtime;

(4) An evaluation of alternatives to the use of overtime; and

(5) Submission of a semi-annual report that includes for exempt and non-exempt employees:

(i) Total cost of overtime;

(ii) Total cost of straight time;

(iii) Overtime cost as a percentage of straight-time cost;

(iv) Total overtime hours;

(v) Total straight-time hours; and

(vi) Overtime hours as a percentage of straight-time hours.

CLAUSE I.86 - DEAR 970.5223-1 INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO WORK PLANNING AND EXECUTION (DEC 2000)

(a) For the purposes of this clause,

(1) Safety encompasses environment, safety and health, including pollution prevention and waste minimization; and

(2) Employees include subcontractor employees.

(b) In performing work under this contract, the contractor shall perform work safely, in a manner that ensures adequate protection for employees, the public, and the environment, and shall be accountable for the safe performance of work. The contractor shall exercise a degree of care commensurate with the work and the associated hazards. The contractor shall ensure that management of environment, safety and health (ES&H) functions and activities becomes an integral but visible part of the contractor's work planning and execution processes. The contractor shall, in the performance of work, ensure that:

(1) Line management is responsible for the protection of employees, the public, and the environment. Line management includes those contractor and subcontractor employees managing or supervising employees performing work.

(2) Clear and unambiguous lines of authority and responsibility for ensuring (ES&H) are established and maintained at all organizational levels.

(3) Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

(4) Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.

(5) Before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements are established which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences.

(6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.

(7) The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed-upon by DOE and the contractor. These agreed-upon conditions and requirements are requirements of the contract and binding upon the contractor. The extent of documentation and level of authority for agreement shall be tailored to the complexity and hazards associated with the work and shall be established in a Safety Management System.

(c) The contractor shall manage and perform work in accordance with a documented Safety Management System (System) that fulfills all conditions in paragraph (b) of this clause at a minimum. Documentation of the System shall describe how the contractor will:

(1) Define the scope of work;

(2) Identify and analyze hazards associated with the work;

(3) Develop and implement hazard controls;

(4) Perform work within controls; and

(5) Provide feedback on adequacy of controls and continue to improve safety management.

(d) The System shall describe how the contractor will establish, document, and implement safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the System. The System shall also describe how the contractor will measure system effectiveness.

(e) The contractor shall submit to the contracting officer documentation of its System for review and approval. Dates for submittal, discussions, and revisions to the System will be established by the contracting officer. Guidance on the preparation, content, review, and approval of the System will be provided by the contracting officer. On an annual basis, the contractor shall review and update, for DOE approval, its safety performance objectives, performance measures, and commitments consistent with and in response to DOE's program and budget execution guidance and direction. Resources shall be identified and allocated to meet the safety objectives and performance commitments as well as maintain the integrity of the entire System. Accordingly, the System shall be integrated with the contractor's business processes for work planning, budgeting, authorization, execution, and change control.

(f) The contractor shall comply with, and assist the Department of Energy in complying with, ES&H requirements of all applicable laws and regulations, and applicable directives identified in the clause of this contract entitled "Laws, Regulations, and DOE Directives." The contractor shall cooperate with Federal and non-Federal agencies having jurisdiction over ES&H matters under this contract.

(g) The contractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements and the System. If the contractor fails to provide resolution or if, at any time, the contractor's acts or failure to act causes substantial harm or an imminent danger to the environment or health and safety of employees or the public, the contracting officer may issue an order stopping work in whole or in part. Any stop work order issued by a contracting officer under this clause (or issued by the contractor to a subcontractor in accordance with paragraph (i) of this clause) shall be without prejudice to any other legal or contractual rights of the Government. In the event that the contracting officer issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of the contracting officer. The contractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.

(h) Regardless of the performer of the work, the contractor is responsible for compliance with the ES&H requirements applicable to this contract. The contractor is responsible for flowing down the ES&H requirements applicable to this contract to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

(i) The contractor shall include a clause substantially the same as this clause in subcontracts involving complex or hazardous work on site at a DOE-owned or -leased facility. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (g) of this clause. Depending on the complexity and hazards associated with the work, the contractor may choose not to require the subcontractor to submit a Safety Management System for the contractor's review and approval.

CLAUSE I.87 - DEAR 970.5223-2 ACQUISITION AND USE OF ENVIRONMENTALLY PREFERABLE PRODUCTS AND SERVICES (DEC 2000)

(a) In the performance of this contract, the Contractor shall comply with the requirements of the following issuances:

(1) Executive Order 13101 of September 14, 1998, entitled "Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition."

(2) Section 6002 of the Resource Conservation and Recovery Act (RCRA) of 1976, as amended (42 U.S.C. 6962, Pub. L. 94-580, 90 Stat. 2822),

(3) Title 40 of the Code of Federal Regulations, Subchapter I, Part 247 (Comprehensive Guidelines for the Procurement of Products Containing Recovered Materials) and such other Subchapter I Parts or Comprehensive Procurement Guidelines as the Environmental Protection Agency may issue from time to time as guidelines for the procurement of products that contain recovered/recycled materials,

(4) "U.S. Department of Energy Affirmative Procurement Program for Products Containing Recovered Materials" and related guidance document(s), as they are identified in writing by the Department.

(b) The Contractor shall prepare and submit reports on matters related to the use of environmentally preferable products and services from time to time in accordance with written direction (e.g., in a specified format) from the Contracting Officer.

(c) In complying with the requirements of paragraph (a) of this clause, the Contractor shall coordinate its concerns and seek implementing guidance on Federal and

Departmental policy, plans, and program guidance with the DOE recycling point of contact, who shall be identified by the Contracting Officer. Reports required pursuant to paragraph (b) of this clause, shall be submitted through the DOE recycling point of contact.

CLAUSE I.88 - DEAR 970.5223-4 WORKPLACE SUBSTANCE ABUSE PROGRAMS AT DOE SITES (DEC 2000)

(a) Program Implementation. The contractor shall, consistent with 10 CFR part 707, Workplace Substance Abuse Programs at DOE Sites, incorporated herein by reference with full force and effect, develop, implement, and maintain a workplace substance abuse program.

(b) Remedies. In addition to any other remedies available to the Government, the contractor's failure to comply with the requirements of 10 CFR part 707 or to perform in a manner consistent with its approved program may render the contractor subject to: the suspension of contract payments, or, where applicable, a reduction in award fee; termination for default; and suspension or debarment.

(c) Subcontracts.

(1) The contractor agrees to notify the contracting officer reasonably in advance of, but not later than 30 days prior to, the award of any subcontract the contractor believes may be subject to the requirements of 10 CFR part 707.

(2) The DOE prime contractor shall require all subcontracts subject to the provisions of 10 CFR part 707 to agree to develop and implement a workplace substance abuse program that complies with the requirements of 10 CFR part 707, Workplace Substance Abuse Programs at DOE Sites, as a condition for award of the subcontract. The DOE prime contractor shall review and approve each subcontractor's program, and shall periodically monitor each subcontractor's implementation of the program for effectiveness and compliance with 10 CFR part 707.

(3) The contractor agrees to include, and require the inclusion of, the requirements of this clause in all subcontracts, at any tier, that are subject to the provisions of 10 CFR part 707.

CLAUSE I.89 - DEAR 970.5226-1 DIVERSITY PLAN (DEC 2000)

The Contractor shall submit a Diversity Plan to the Contracting Officer for approval within 90 days after the effective date of this contract (or contract modification, if appropriate).

The Contractor shall submit an update to its Plan annually or with its annual fee proposal. Guidance for preparation of a Diversity Plan is provided in Appendix M. The Plan shall include innovative strategies for increasing opportunities to fully use the talents and capabilities of a diverse work force. The Plan shall address, at a minimum, the Contractor's approach for promoting diversity through (1) the Contractor's work force, (2) educational outreach, (3) community involvement and outreach, (4) subcontracting, (5) economic development (including technology transfer), and (6) the prevention of profiling based on race or national origin.

CLAUSE I.90 - DEAR 970.5226-3 COMMUNITY COMMITMENT (DEC 2000)

It is the policy of the DOE to be a constructive partner in the geographic region in which DOE conducts its business. The basic elements of this policy include: (1) recognizing the diverse interests of the region and its stakeholders, (2) engaging regional stakeholders in issues and concerns of mutual interest, and (3) recognizing that giving back to the community is a worthwhile business practice. Accordingly, the Contractor agrees that its business operations and performance under the Contract will be consistent with the intent of the policy and elements set forth above.

CLAUSE I.91 - DEAR 970.5227-2 RIGHTS IN DATA-TECHNOLOGY TRANSFER (DEC 2000)

(a) Definitions.

(1) Computer data bases, as used in this clause, means a collection of data in a form capable of, and for the purpose of, being stored in, processed, and operated on by a computer. The term does not include computer software.

(2) Computer software, as used in this clause, means (i) computer programs which are data comprising a series of instructions, rules, routines, or statements, regardless of the media in which recorded, that allow or cause a computer to perform a specific operation or series of operations and (ii) data comprising source code listings, design details, algorithms, processes, flow charts, formulae, and related material that would enable the computer program to be produced, created, or compiled. The term does not include computer data bases.

(3) Data, as used in this clause, means recorded information, regardless of form or the media on which it may be recorded. The term includes technical data and computer software. The term "data" does not include data incidental to the administration of this contract, such as financial, administrative, cost and pricing, or management information.

(4) Limited rights data, as used in this clause, means data, other than computer software, developed at private expense that embody trade secrets or are commercial or financial and confidential or privileged. The Government's rights to use, duplicate, or disclose limited rights data are as set forth in the Limited Rights Notice of paragraph (g) of this clause.

(5) Restricted computer software, as used in this clause, means computer software developed at private expense and that is a trade secret; is commercial or financial and is confidential or privileged; or is published copyrighted computer software, including minor modifications of any such computer software. The Government's rights to use, duplicate, or disclose restricted computer software are as set forth in the Restricted Rights Notice of subparagraph (h) of this clause.

(6) Technical data, as used in this clause, means recorded data, regardless of form or characteristic, that are of a scientific or technical nature. Technical data does not include computer software, but does include manuals and instructional materials and technical data formatted as a computer data base.

(7) Unlimited rights, as used in this clause, means the rights of the Government to use, disclose, reproduce, prepare derivative works, distribute copies to the public, including by electronic means, and perform publicly and display publicly, in any manner, including by electronic means, and for any purpose whatsoever, and to have or permit others to do so.

(b) Allocation of Rights.

(1) The Government shall have:

(i) Ownership of all technical data and computer software first produced in the performance of this Contract;

(ii) Unlimited rights in technical data and computer software specifically used in the performance of this Contract, except as provided herein regarding copyright, limited rights data, or restricted computer software, and except for data subject to the withholding provisions for protected Cooperative Research and Development Agreement (CRADA) information in accordance with Technology Transfer actions under this Contract, or other data specifically protected by statute for a period of time or, where, approved by DOE, appropriate instances of the DOE Work for Others Program;

(iii) The right to inspect technical data and computer software first produced or specifically used in the performance of this Contract at

all reasonable times. The Contractor shall make available all necessary facilities to allow DOE personnel to perform such inspection;

(iv) The right to have all technical data and computer software first produced or specifically used in the performance of this Contract delivered to the Government or otherwise disposed of by the Contractor, either as the Contracting Officer may from time to time direct during the progress of the work or in any event as the Contracting Officer shall direct upon completion or termination of this Contract. The Contractor agrees to leave a copy of such data at the facility or plant to which such data relate, and to make available for access or to deliver to the Government such data upon request by the Contracting Officer. If such data are limited rights data or restricted computer software, the rights of the Government in such data shall be governed solely by the provisions of paragraph (g) of this clause ("Rights in Limited Rights Data") or paragraph (h) of this clause ("Rights in Restricted Computer Software"); and

(v) The right to remove, cancel, correct, or ignore any markings not authorized by the terms of this Contract on any data furnished hereunder if, in response to a written inquiry by DOE concerning the propriety of the markings, the Contractor fails to respond thereto within 60 days or fails to substantiate the propriety of the markings. In either case DOE will notify the Contractor of the action taken.

(2) The Contractor shall have:

(i) The right to withhold its limited rights data and restricted computer software unless otherwise provided in provisions of this clause;

(ii) The right to use for its private purposes, subject to patent, security or other provisions of this Contract, data it first produces in the performance of this Contract, except for data in DOE's Uranium Enrichment Technology, including diffusion, centrifuge, and atomic vapor laser isotope separation, provided the data requirements of this Contract have been met as of the date of the private use of such data; and

(iii) The right to assert copyright subsisting in scientific and technical articles as provided in paragraph (d) of this clause and the right to request permission to assert copyright subsisting in works other than scientific and technical articles as provided in paragraph (e) of this clause.

(3) The Contractor agrees that for limited rights data or restricted computer software or other technical, business or financial data in the form of recorded information which it receives from, or is given access to by DOE or a third party, including a DOE Contractor or subcontractor, and for technical data or computer software it first produces under this Contract which is authorized to be marked by DOE, the Contractor shall treat such data in accordance with any restrictive legend contained thereon.

(c) Copyright (General).

(1) The Contractor agrees not to mark, register or otherwise assert copyright in any data in a published or unpublished work, other than as set forth in paragraphs (d) and (e) of this clause.

(2) Except for material to which the Contractor has obtained the right to assert copyright in accordance with either paragraph (d) or (e) of this clause, the Contractor agrees not to include in the data delivered under this Contract any material copyrighted by the Contractor and not to knowingly include any material copyrighted by others without first granting or obtaining at no cost a license therein for the benefit of the Government of the same scope as set forth in paragraph (d) of this clause. If the Contractor believes that such copyrighted material for which the license cannot be obtained must be included in the data to be delivered, rather than merely incorporated therein by reference, the Contractor shall obtain the written authorization of the Contracting Officer to include such material in the data prior to its delivery.

(d) Copyrighted works (scientific and technical articles).

(1) The Contractor shall have the right to assert, without prior approval of the Contracting Officer, copyright subsisting in scientific and technical articles composed under this Contract or based on or containing data first produced in the performance of this Contract, and published in academic, technical or professional journals, symposia proceedings or similar works. When assertion of copyright is made, the Contractor shall affix the applicable copyright notice of 17 U.S.C. 401 or 402 and acknowledgement of Government sponsorship (including contract number) on the data when such data are delivered to the Government as well as when the data are published or deposited for registration as a published work in the U.S. Copyright Office. The Contractor grants to the Government, and others acting on its behalf, a non-exclusive, paid-up, irrevocable, world-wide license in such copyrighted data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government.

(2) The Contractor shall mark each scientific or technical article first produced or composed under this Contract and submitted for journal publication or similar means of dissemination with a notice, similar in all material respects to the following, on the front reflecting the Government's non-exclusive, paid-up, irrevocable, world-wide license in the copyright.

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(End of Notice)

(3) The title to the copyright of the original of unclassified graduate theses and the original of related unclassified scientific papers shall vest in the author thereof, subject to the right of DOE to retain duplicates of such documents and to use such documents for any purpose whatsoever without any claim on the part of the author or the contractor for additional compensation.

(e) Copyrighted works (other than scientific and technical articles and data produced under a CRADA). The Contractor may obtain permission to assert copyright subsisting in technical data and computer software first produced by the Contractor in performance of this Contract, where the Contractor can show that commercialization would be enhanced by such copyright protection, subject to the following:

(1) Contractor Request to Assert Copyright.

(i) For data other than scientific and technical articles and data produced under a CRADA, the Contractor shall submit in writing to Patent Counsel its request to assert copyright in data first produced in the performance of this Contract pursuant to this clause. The right of the Contractor to copyright data first produced under a CRADA is as described in the individual CRADA. Each request by the Contractor must include:

(A) The identity of the data (including any computer program) for which the Contractor requests permission to assert copyright, as well as an abstract which is descriptive of the data and is suitable for dissemination purposes,

(B) The program under which it was funded,

(C) Whether, to the best knowledge of the Contractor, the data is subject to an international treaty or agreement,

(D) Whether the data is subject to export control,

(E) A statement that the Contractor plans to commercialize the data in compliance with the clause of this contract entitled, "Technology Transfer Mission," within five (5) years after obtaining permission to assert copyright or, on a case-by-case basis, a specified longer period where the Contractor can demonstrate that the ability to commercialize effectively is dependent upon such longer period, and

(F) For data other than computer software, a statement explaining why the assertion of copyright is necessary to enhance commercialization and is consistent with DOE's dissemination responsibilities.

(ii) For data that is developed using other funding sources in addition to DOE funding, the permission to assert copyright in accordance with this clause must also be obtained by the Contractor from all other funding sources prior to the Contractor's request to Patent Counsel. The request shall include the Contractor's certification or other documentation acceptable to Patent Counsel demonstrating such permission has been obtained.

(iii) Permission for the Contractor to assert copyright in excepted categories of data as determined by DOE will be expressly withheld. Such excepted categories include data whose release (A) would be detrimental to national security, i.e., involve classified information or data or sensitive information under Section 148 of the Atomic Energy Act of 1954, as amended, or are subject to export control for nonproliferation and other nuclear-related national security purposes, (B) would not enhance the appropriate transfer or dissemination and commercialization of such data, (C) would have a negative impact on U.S. industrial competitiveness, (D) would prevent DOE from meeting its obligations under treaties and international agreements, or (E) would be detrimental to one or more of DOE's programs. Additional excepted categories may be added by the Assistant General Counsel for Technology Transfer and Intellectual Property. Where data are determined to be under export control restriction, the Contractor may obtain permission to assert copyright subject to the provisions of this clause for purposes

of limited commercialization in a manner that complies with export control statutes and applicable regulations. In addition, notwithstanding any other provision of this Contract, all data developed with Naval Reactors' funding and those data that are classified fall within excepted categories. The rights of the Contractor in data are subject to the disposition of data rights in the treaties and international agreements identified under this Contract as well as those additional treaties and international agreements which DOE may from time to time identify by unilateral amendment to the Contract; such amendment listing added treaties and international agreements is effective only for data which is developed after the date such treaty or international agreement is added to this Contract. Also, the Contractor will not be permitted to assert copyright in data in the form of various technical reports generated by the Contractor under the Contract without first obtaining the advanced written permission of the Contracting Officer.

(2) DOE Review and Response to Contractor's Request.

The Patent Counsel shall use its best efforts to respond in writing within 90 days of receipt of a complete request by the Contractor to assert copyright in technical data and computer software pursuant to this clause. Such response shall either give or withhold DOE's permission for the Contractor to assert copyright or advise the Contractor that DOE needs additional time to respond, and the reasons therefor.

(3) Permission for Contractor to Assert Copyright.

(i) For computer software, the Contractor shall furnish to the DOE designated, centralized software distribution and control point, the Energy Science and Technology Software Center, at the time permission to assert copyright is given under paragraph (e)(2) of this clause: (A) An abstract describing the software suitable for publication, (B) the source code for each software program, and (C) the object code and at least the minimum support documentation needed by a technically competent user to understand and use the software. The Patent Counsel, for good cause shown by the Contractor, may allow the minimum support documentation to be delivered within 60 days after permission to assert copyright is given or at such time the minimum support documentation becomes available. The Contractor acknowledges that the DOE designated software distribution and control point may provide a technical description of the software in an announcement identifying its availability from the copyright holder.

(ii) Unless otherwise directed by the Contracting Officer, for data other than computer software to which the Contractor has received permission to assert copyright under paragraph (e)(2) of this clause above, the Contractor shall within sixty (60) days of obtaining such permission furnish to DOE's Office of Scientific and Technical Information (OSTI) a copy of such data as well as an abstract of the data suitable for dissemination purposes. The Contractor acknowledges that OSTI may provide an abstract of the data in an announcement to DOE, its contractors and to the public identifying its availability from the copyright holder.

(iii) For a five year period or such other specified period as specifically approved by Patent Counsel beginning on the date the Contractor is given permission to assert copyright in data, the Contractor grants to the Government, and others acting on its behalf, a paid-up, nonexclusive, irrevocable worldwide license in such copyrighted data to reproduce, prepare derivative works and perform publicly and display publicly, by or on behalf of the Government. Upon request, the initial period may be extended after DOE approval. The DOE approval will be based on the standard that the work is still commercially available and the market demand is being met.

(iv) After the period approved by Patent Counsel for application of the limited Government license described in paragraph (e)(3)(iii) of this clause, or if, prior to the end of such period(s), the Contractor abandons commercialization activities pertaining to the data to which the Contractor has been given permission to assert copyright, the Contractor grants to the Government, and others acting on its behalf, a paid-up, nonexclusive, irrevocable worldwide license in such copyrighted data to reproduce, distribute copies to the public, prepare derivative works, perform publicly and display publicly, and to permit others to do so.

(v) Whenever the Contractor asserts copyright in data pursuant to this paragraph (e), the Contractor shall affix the applicable copyright notice of 17 U.S.C. 401 or 402 on the copyrighted data and also an acknowledgement of the Government sponsorship and license rights of paragraphs (e)(3)(iii) and (iv) of this clause. Such action shall be taken when the data are delivered to the Government, published, licensed or deposited for registration as a published work in the U.S. Copyright Office.

The acknowledgement of Government sponsorship and license rights shall be as follows:

NOTICE: These data were produced by Brookhaven Science Associates, LLC under Contract No. DE-AC02-98CH10886 with the Department of Energy. For (period approved by DOE Patent Counsel) from (date permission to assert copyright was obtained), the Government is granted for itself and others acting on its behalf a nonexclusive, paid-up, irrevocable worldwide license in this data to reproduce, prepare derivative works, and perform publicly and display publicly, by or on behalf of the Government. There is provision for the possible extension of the term of this license. Subsequent to that period or any extension granted, the Government is granted for itself and others acting on its behalf a nonexclusive, paid-up, irrevocable worldwide license in this data to reproduce, prepare derivative works, distribute copies to the public, perform publicly and display publicly, and to permit others to do so. The specific term of the license can be identified by inquiry made to Contractor or DOE. Neither the United States nor the United States Department of Energy, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any data, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

(End of Notice)

(vi) With respect to any data to which the Contractor has received permission to assert copyright, the DOE has the right, during the five (5) year or specified longer period approved by Patent Counsel as provided for in paragraph (e) of this clause, to request the Contractor to grant a nonexclusive, partially exclusive or exclusive license in any field of use to a responsible applicant(s) upon terms that are reasonable under the circumstances, and if the Contractor refuses such request, to grant such license itself, if the DOE determines that the Contractor has not made a satisfactory demonstration that either it or its licensee(s) is actively pursuing commercialization of the data as set forth in subparagraph (e)(l)(A) of this clause. Before licensing under this subparagraph (vi), DOE shall furnish the Contractor a written request for the Contractor to grant the stated license, and the Contractor shall be allowed thirty (30) days (or such longer period as may be authorized by the Contracting Officer for good cause shown in writing by the Contractor) after such notice to show cause why the license should not be granted. The Contractor shall have the right to appeal the decision of the DOE to grant the stated license to the Invention Licensing Appeal Board as set forth in 10 CFR 781.65 - "Appeals."

(vii) No costs shall be allowable for maintenance of copyrighted data, primarily for the benefit of the Contractor and/or a licensee which exceeds DOE Program needs, except as expressly provided in writing by the Contracting Officer. The Contractor may use its net royalty income to effect such maintenance costs.

(viii) At any time the Contractor abandons commercialization activities for data for which the Contractor has received permission to assert copyright in accordance with this clause, it shall advise OSTI and Patent Counsel and upon request assign the copyright to the Government so that the Government can distribute the data to the public.

(4) The following notice may be placed on computer software prior to any publication and prior to the Contractor's obtaining permission from the Department of Energy to assert copyright in the computer software pursuant to paragraph (c)(3) of this section.

NOTICE: This computer software was prepared by Brookhaven Science Associates, LLC and [insert the individual author], hereinafter the Contractor, under Contract No. DE-AC02-98CH10886 with the Department of Energy (DOE). All rights in the computer software are reserved by DOE on behalf of the United States Government and the Contractor as provided in the Contract. You are authorized to use this computer software for Governmental purposes but it is not to be released or distributed to the public. NEITHER THE GOVERNMENT NOR THE CONTRACTOR MAKES ANY WARRANTY, EXPRESS OR IMPLIED, OR ASSUMES ANY LIABILITY FOR THE USE OF THIS SOFTWARE. This notice including this sentence must appear on any copies of this computer software.

(End of Notice)

(5) A similar notice can be used for data, other than computer software, upon approval of DOE Patent Counsel.

(f) Subcontracting.

(1) Unless otherwise directed by the Contracting Officer, the Contractor agrees to use in subcontracts in which technical data or computer software is expected to be produced or in subcontracts for supplies that contain a requirement for production or delivery of data in accordance with the policy and procedures of 48 CFR Subpart 27.4 as supplemented by 48 CFR 927.401 through 927.409, the clause entitled, "Rights in Data-General" at 48 CFR 52.227-14 modified in accordance with 927.409(a) and including Alternate V. Alternates II through IV of that clause may be included as

appropriate with the prior approval of DOE Patent Counsel, and the Contractor shall not acquire rights in a subcontractor's limited rights data or restricted computer software, except through the use of Alternates II or III, respectively, without the prior approval of DOE Patent Counsel. The clause at 48 CFR 52.227-16, Additional Data Requirements, shall be included in subcontracts in accordance with 48 CFR 927.409(h). The Contractor shall use instead the Rights in Data--Facilities clause at 48 CFR 970.5227-1 in subcontracts, including subcontracts for related support services, involving the design or operation of any plants or facilities or specially designed equipment for such plants or facilities that are managed or operated under its contract with DOE.

(2) It is the responsibility of the Contractor to obtain from its subcontractors technical data and computer software and rights therein, on behalf of the Government, necessary to fulfill the Contractor's obligations to the Government with respect to such data. In the event of refusal by a subcontractor to accept a clause affording the Government such rights, the Contractor shall:

(i) Promptly submit written notice to the Contracting Officer setting forth reasons for the subcontractor's refusal and other pertinent information which may expedite disposition of the matter, and

(ii) Not proceed with the subcontract without the written authorization of the Contracting Officer.

(3) Neither the Contractor nor higher-tier subcontractors shall use their power to award subcontracts as economic leverage to acquire rights in a subcontractor's limited rights data and restricted computer software for their private use.

(g) Rights in Limited Rights Data.

Except as may be otherwise specified in this Contract as data which are not subject to this paragraph, the Contractor agrees to and does hereby grant to the Government an irrevocable nonexclusive, paid-up license by or for the Government, in any limited rights data of the Contractor specifically used in the performance of this Contract, provided, however, that to the extent that any limited rights data when furnished or delivered is specifically identified by the Contractor at the time of initial delivery to the Government or a representative of the Government, such data shall not be used within or outside the Government except as provided in the "Limited Rights Notice" set forth below. All such limited rights data shall be marked with the following "Limited Rights Notice:"

LIMITED RIGHTS NOTICE

These data contain "limited rights data," furnished under Contract No. DE-AC02-98CH10886 with the United States Department of Energy which may be duplicated and used by the Government with the express limitations that the "limited rights data" may not be disclosed outside the Government or be used for purposes of manufacture without prior permission of the Contractor, except that further disclosure or use may be made solely for the following purposes:

(a) Use (except for manufacture) by support services contractors within the scope of their contracts;

(b) This "limited rights data" may be disclosed for evaluation purposes under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;

(c) This "limited rights data" may be disclosed to other contractors participating in the Government's program of which this Contract is a part for information or use (except for manufacture) in connection with the work performed under their contracts and under the restriction that the "limited rights data" be retained in confidence and not be further disclosed;

(d) This "limited rights data" may be used by the Government or others on its behalf for emergency repair or overhaul work under the restriction that the "limited rights data" be retained in confidence and not be further disclosed; and

(e) Release to a foreign government, or instrumentality thereof, as the interests of the United States Government may require, for information or evaluation, or for emergency repair or overhaul work by such government.

This Notice shall be marked on any reproduction of this data in whole or in part.

(End of Notice)

(h) Rights in Restricted Computer Software.

(1) Except as may be otherwise specified in this Contract as data which are not subject to this paragraph, the Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, paid-up, license by or for the Government, in any restricted computer software of the Contractor specifically used in the performance of this Contract; provided, however, that to the extent that any restricted computer software when

furnished or delivered is specifically identified by the Contractor at the time of initial delivery to the Government or a representative of the Government, such data shall not be used within or outside the Government except as provided in the "Restricted Rights Notice" set forth below. All such restricted computer software shall be marked with the following "Restricted Rights Notice:"

Restricted Rights Notice-Long Form

(a) This computer software is submitted with restricted rights under Department of Energy Contract No. DE-AC02-98CH10886. It may not be used, reproduced, or disclosed by the Government except as provided in paragraph (b) of this notice.

(b) This computer software may be:

(1) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Government installation to which such computer or computers may be transferred;

(2) Used, copied for use, in a backup or replacement computer if any computer for which it was acquired is inoperative or is replaced;

(3) Reproduced for safekeeping (archives) or backup purposes;

(4) Modified, adapted, or combined with other computer software, provided that only the portions of the derivative software consisting of the restricted computer software are to be made subject to the same restricted rights; and

(5) Disclosed to and reproduced for use by contractors under a service contract (of the type defined in 48 CFR 37.101) in accordance with subparagraphs (b)(l) through (4) of this Notice, provided the Government makes such disclosure or reproduction subject to these restricted rights.

(c) Notwithstanding the foregoing, if this computer software has been published under copyright, it is licensed to the Government, without disclosure prohibitions, with the rights set forth in the restricted rights notice above.

(d) This Notice shall be marked on any reproduction of this computer software, in whole or in part.

(End of Notice)

(2) Where it is impractical to include the Restricted Rights Notice on restricted computer software, the following short-form Notice may be used in lieu thereof:

Restricted Rights Notice—Short Form

Use, reproduction, or disclosure is subject to restrictions set forth in the Long Form Notice of DOE Contract No. DE-AC02-98CH10886 with Brookhaven Science Associates, LLC.

(End of Notice)

(3) If the software is embedded, or if it is commercially impractical to mark it with human readable text, then the symbol R and the clause date (mo/yr) in brackets or a box, a [R-mo/yr], may be used. This will be read to mean restricted computer software, subject to the rights of the Government as described in the Long Form Notice, in effect as of the date indicated next to the symbol. The symbol shall not be used to mark human readable material. In the event this Contract contains any variation to the rights in the Long Form Notice, then the contract number must also be cited.

(4) If restricted computer software is delivered with the copyright notice of 17 U.S.C. 401, the software will be presumed to be published copyrighted computer software licensed to the Government without disclosure prohibitions and with unlimited rights, unless the Contractor includes the following statement with such copyright notice "Unpublished--rights reserved under the Copyright Laws of the United States."

(i) Relationship to Patents.

Nothing contained in this clause creates or is intended to imply a license to the Government in any patent or is intended to be construed as affecting the scope of any licenses or other rights otherwise granted to the Government under any patent.

CLAUSE I.92 - DEAR 970.5227-3 TECHNOLOGY TRANSFER MISSION (AUG 2002) (DEVIATION)

This clause has as its purpose implementation of the National Competitiveness Technology Transfer Act of 1989 (Sections 3131, 3132, 3133, and 3157 of Pub. L. 101-189 and as amended by Pub. L. 103-160, Sections 3134 and 3160). The Contractor

shall conduct technology transfer activities with a purpose of providing benefit from Federal research to U.S. industrial competitiveness.

(a) Authority.

(1) In order to ensure the full use of the results of research and development efforts of, and the capabilities of, the Laboratory, technology transfer, including Cooperative Research and Development Agreements (CRADAs), is established as a mission of the Laboratory consistent with the policy, principles and purposes of Sections 11(a)(1) and 12(g) of the Stevenson-Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3710a); Section 3132(b) of Pub. L. 101-189, Sections 3134 and 3160 of Pub. L. 103-160, and of Chapter 38 of the Patent Laws (35 U.S.C. 200 et seq.); Section 152 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2182); Section 9 of the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5908); and Executive Order 12591 of April 10, 1987.

(2) In pursuing the technology transfer mission, the Contractor is authorized to conduct activities including but not limited to: identifying and protecting Intellectual Property made, created or acquired at or by the Laboratory; negotiating licensing agreements and assignments for Intellectual Property made, created or acquired at or by the Laboratory that the Contractor controls or owns; bailments; negotiating all aspects of and entering into CRADAs; providing technical consulting and personnel exchanges; conducting science education activities and reimbursable Work for Others (WFO); providing information exchanges; and making available laboratory or weapon production user facilities. It is fully expected that the Contractor shall use all of the mechanisms available to it to accomplish this technology transfer mission, including, but not limited to, CRADAs, user facilities, WFO, science education activities, consulting, personnel assignments, and licensing in accordance with this clause.

(b) Definitions.

(1) Contractor's Laboratory Director means the individual who has supervision over all or substantially all of the Contractor's operations at the Laboratory.

(2) Intellectual Property means patents, trademarks, copyrights, mask works, protected CRADA information, and other forms of comparable property rights protected by Federal Law and other foreign counterparts.

(3) Cooperative Research and Development Agreement (CRADA) means any agreement entered into between the Contractor as operator of the Laboratory, and one or more parties including at least one non-Federal

party under which the Government, through its laboratory, provides personnel, services, facilities, equipment, intellectual property, or other resources with or without reimbursement (but not funds to non-Federal parties) and the non-Federal parties provide funds, personnel, services, facilities, equipment, intellectual property, or other resources toward the conduct of specified research or development efforts which are consistent with the missions of the Laboratory; except that such term does not include a procurement contract, grant, or cooperative agreement as those terms are used in sections 6303, 6304, and 6305 of Title 31 of the United States Code.

(4) Joint Work Statement (JWS) means a proposal for a CRADA prepared by the Contractor, signed by the Contractor's Laboratory Director or designee which describes the following:

(i) Purpose;

(ii) Scope of Work which delineates the rights and responsibilities of the Government, the Contractor and Third Parties, one of which must be a non-Federal party;

(iii) Schedule for the work; and

(iv) Cost and resource contributions of the parties associated with the work and the schedule.

(5) Assignment means any agreement by which the Contractor transfers ownership of Laboratory Intellectual Property, subject to the Government's retained rights.

(6) Laboratory Biological Materials means biological materials capable of replication or reproduction, such as plasmids, deoxyribonucleic acid molecules, ribonucleic acid molecules, living organisms of any sort and their progeny, including viruses, prokaryote and eukaryote cell lines, transgenic plants and animals, and any derivatives or modifications thereof or products produced through their use or associated biological products, made under this contract by Laboratory employees or through the use of Laboratory research facilities.

(7) Laboratory Tangible Research Product means tangible material results of research which

(i) are provided to permit replication, reproduction, evaluation or confirmation of the research effort, or to evaluate its potential commercial utility;

(ii) are not materials generally commercially available; and

(iii) were made under this contract by Laboratory employees or through the use of Laboratory research facilities.

(8) Bailment means any agreement in which the Contractor permits the commercial or non- commercial transfer of custody, access or use of Laboratory Biological Materials or Laboratory Tangible Research Product for a specified purpose of technology transfer or research and development, including without limitation evaluation, and without transferring ownership to the bailee.

(c) Allowable Costs.

(1) The Contractor shall establish and carry out its technology transfer efforts through appropriate organizational elements consistent with the requirements for an Office of Research and Technology Applications (ORTA) pursuant to paragraphs (b) and (c) of Section 11 of the Stevenson - Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3710). The costs associated with the conduct of technology transfer through the ORTA including activities associated with obtaining, maintaining, licensing, and assigning Intellectual Property rights, increasing the potential for the transfer of technology, and the widespread notice of technology transfer opportunities, shall be deemed allowable provided that such costs meet the other requirements of the allowable costs provisions of this Contract. In addition to any separately designated funds, these costs in any fiscal year shall not exceed an amount equal to 0.5 percent of the operating funds included in the Federal research and development budget (including Work For Others) of the Laboratory for that fiscal year without written approval of the Contracting Officer.

(2) The Contractor's participation in litigation to enforce or defend Intellectual Property claims incurred in its technology transfer efforts shall be as provided in the clause entitled "Insurance--Litigation and Claims" of this contract.

(d) Conflicts of Interest - Technology Transfer.

The Contractor shall have implementing procedures that seek to avoid employee and organizational conflicts of interest, or the appearance of conflicts of interest, in the conduct of its technology transfer activities. These procedures shall apply to other persons participating in Laboratory research or related technology transfer activities. Such implementing procedures shall be provided to the contracting officer for review and approval within sixty (60) days after execution of

this contract. The contracting officer shall have thirty (30) days thereafter to approve or require specific changes to such procedures. Such implementing procedures shall include procedures to:

(1) Inform employees of and require conformance with standards of conduct and integrity in connection with the CRADA activity in accordance with the provisions of paragraph (n)(5) of this clause;

(2) Review and approve employee activities so as to avoid conflicts of interest arising from commercial utilization activities relating to Contractor-developed Intellectual Property;

(3) Conduct work performed using royalties so as to avoid interference with or adverse effects on ongoing DOE projects and programs;

(4) Conduct activities relating to commercial utilization of Contractor-developed Intellectual Property so as to avoid interference with or adverse effects on user facility or WFO activities of the Contractor;

(5) Conduct DOE-funded projects and programs so as to avoid the appearance of conflicts of interest or actual conflicts of interest with non-Government funded work;

(6) Notify the contracting officer with respect to any new work to be performed or proposed to be performed under the Contract for DOE or other Federal agencies where the new work or proposal involves Intellectual Property in which the Contractor has obtained or intends to request or elect title;

(7) Except as provided elsewhere in this Contract, obtain the approval of the contracting officer for any licensing of or assignment of title to Intellectual Property rights by the Contractor to any business or corporate affiliate of the Contractor;

(8) Obtain the approval of the contracting officer prior to any assignment, exclusive licensing, or option for exclusive licensing, of Intellectual Property to any individual who has been a Laboratory employee within the previous two years or to the company in which the individual is a principal;

(9) Notify non-Federal sponsors of WFO activities, or non-Federal users of user facilities, of any relevant Intellectual Property interest of the Contractor prior to execution of WFOs or user agreements; and

(10) Notify DOE prior to evaluating a proposal by a third party or DOE, when the subject matter of the proposal involves an elected or waived subject

invention under this contract or one in which the Contractor intends to elect to retain title under this contract.

(e) Fairness of Opportunity.

In conducting its technology transfer activities, the Contractor shall prepare procedures and take all reasonable measures to ensure widespread notice of availability of technologies suited for transfer and opportunities for exclusive licensing and joint research arrangements. The requirement to widely disseminate the availability of technology transfer opportunities does not apply to a specific application originated outside of the Laboratory and by entities other than the Contractor.

(f) U.S. Industrial Competitiveness.

(1) In the interest of enhancing U.S. Industrial Competitiveness, the Contractor shall, in its licensing and assignments of Intellectual Property, give preference in such a manner as to enhance the accrual of economic and technological benefits to the U.S. domestic economy. The Contractor shall consider the following factors in all of its licensing and assignment decisions involving Laboratory intellectual property where the Laboratory obtains rights during the course of the Contractor's operation of the Laboratory under this contract:

(i) whether any resulting design and development will be performed in the United States and whether resulting products, embodying parts, including components thereof, will be substantially manufactured in the United States; or

(ii) (A) whether the proposed licensee or assignee has a business unit located in the United States and whether significant economic and technical benefits will flow to the United States as a result of the license or assignment agreement; and

(B) in licensing any entity subject to the control of a foreign company or government, whether such foreign government permits United States agencies, organizations or other persons to enter into cooperative research and development agreements and licensing agreements, and has policies to protect United States Intellectual Property rights.

(2) If the Contractor determines that neither of the conditions in paragraphs (f)(1)(i) or (ii) of this clause are likely to be fulfilled, the Contractor, prior to entering into such an agreement, must obtain the approval of the

contracting officer. The contracting officer shall act on any such requests for approval within thirty (30) days.

(3) The Contractor agrees to be bound by the provisions of 35 U.S.C. 204 (Preference for United States industry).

(g) Indemnity - Product Liability.

In entering into written technology transfer agreements, including but not limited to, research and development agreements, licenses, assignments and CRADAs, the Contractor agrees to include in such agreements a requirement that the U.S. Government and the Contractor, except for any negligent acts or omissions of the Contractor, be indemnified for all damages, costs, and expenses, including attorneys' fees, arising from personal injury or property damage occurring as a result of the making, using or selling of a product, process or service by or on behalf of the Participant, its assignees or licensees which was derived from the work performed under the agreement. The Contractor shall identify and obtain the approval of the contracting officer for any proposed exceptions to this requirement such as where State or local law expressly prohibit the Participant from providing indemnification or where the research results will be placed in the public domain.

(h) Disposition of Income.

(1) Royalties or other income earned or retained by the Contractor as a result of performance of authorized technology transfer activities herein shall be used by the Contractor for scientific research, development, technology transfer, and education at the Laboratory, consistent with the research and development mission and objectives of the Laboratory and subject to Section 12(b)(5) of the Stevenson-Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3710a(b)(5)) and Chapter 38 of the Patent Laws (35 U.S.C. 200 et seq.) as amended through the effective date of this contract award or modification. If the net amounts of such royalties and income received from patent licensing after payment of patenting costs, licensing costs, payments to inventors and other expenses incidental to the administration of Subject Inventions during any fiscal year exceed 5 percent of the Laboratory's budget for that fiscal year, 75 percent of such excess amounts shall be paid to the Treasury of the United States, and the remaining amount of such excess shall be used by the Contractor for the purposes as described above in this paragraph. Any inventions arising out of such scientific research and development activities shall be deemed to be Subject Inventions under the Contract.

(2) The Contractor shall include as a part of its annual Laboratory Institutional Plan or other such annual document a plan setting out those uses to which

royalties and other income received as a result of performance of authorized technology transfer activities herein will be applied at the Laboratory, and at the end of the year, provide a separate accounting for how the funds were actually used. Under no circumstances shall these royalties and income be used for an illegal augmentation of funds furnished by the U.S. Government.

(3) The Contractor shall establish subject to the approval of the contracting officer a policy for making awards or sharing of royalties with Contractor employees, other coinventors and coauthors, including Federal employee coinventors when deemed appropriate by the contracting officer.

(i) Transfer to Successor Contractor.

In the event of termination or upon the expiration of this Contract, any unexpended balance of income received for use at the Laboratory shall be transferred, at the contracting officer's request, to a successor contractor, or in the absence of a successor contractor, to such other entity as designated by the contracting officer. The Contractor shall transfer title, as one package, to the extent the Contractor retains title, in all patents and patent applications, licenses, accounts containing royalty revenues from such license agreements, including equity positions in third party entities, and other Intellectual Property rights which arose at the Laboratory, to the successor contractor or to the Government as directed by the contracting officer.

(j) Technology Transfer Affecting the National Security.

(1) The Contractor shall notify and obtain the approval of the contracting officer, prior to entering into any technology transfer arrangement, when such technology or any part of such technology is classified or sensitive under Section 148 of the Atomic Energy Act (42 U.S.C. 2168). Such notification shall include sufficient information to enable DOE to determine the extent that commercialization of such technology would enhance or diminish security interests of the United States, or diminish communications within DOE's nuclear weapon production complex. DOE shall use its best efforts to complete its determination within sixty (60) days of the Contractor's notification, and provision of any supporting information, and DOE shall promptly notify the Contractor as to whether the technology is transferable.

(2) The Contractor shall include in all of its technology transfer agreements with third parties, including, but not limited to, CRADAs, licensing agreements and assignments, notice to such third parties that the export of goods and/or Technical Data from the United States may require some form of export control license or other authority from the U.S. Government

and that failure to obtain such export control license may result in criminal liability under U.S. laws.

(3) For other than fundamental research as defined in National Security Decision Directive 189, the Contractor is responsible to conduct internal export control reviews and assure that technology is transferred in accordance with applicable law.

(k) Records.

The Contractor shall maintain records of its technology transfer activities in a manner and to the extent satisfactory to the DOE and specifically including, but not limited to, the licensing agreements, assignments and the records required to implement the requirements of paragraphs (e), (f), and (h) of this clause and shall provide reports to the contracting officer to enable DOE to maintain the reporting requirements of Section 12(c)(6) of the Stevenson-Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3710a(c)(6)). Such reports shall be made annually in a format to be agreed upon between the Contractor and DOE and in such a format which will serve to adequately inform DOE of the Contractor's technology transfer activities while protecting any data not subject to disclosure under the Rights in Technical Data clause and paragraph (n) of this clause. Such records shall be made available in accordance with the clauses of this Contract pertaining to inspection, audit and examination of records.

(l) Reports to Congress.

To facilitate DOE's reporting to Congress, the Contractor is required to submit annually to DOE a technology transfer plan for conducting its technology transfer function for the upcoming year, including plans for securing Intellectual Property rights in Laboratory innovations with commercial promise and plans for managing such innovations so as to benefit the competitiveness of United States industry. This plan shall be provided to the contracting officer on or before October 1st of each year.

(m) Oversight and Appraisal.

The Contractor is responsible for developing and implementing effective internal controls for all technology transfer activities consistent with the audit and record requirements of this Contract. Laboratory Contractor performance in implementing the technology transfer mission and the effectiveness of the Contractor's procedures will be evaluated by the contracting officer as part of the annual appraisal process, with input from the cognizant Secretarial Officer or program office.

(n) Technology Transfer Through Cooperative Research and Development Agreements.

Upon approval of the contracting officer and as provided in a DOE approved Joint Work Statement (JWS), the Laboratory Director, or designee, may enter into CRADAs on behalf of the DOE subject to the requirements set forth in this paragraph.

(1) Review and Approval of CRADAs

(i) Except as otherwise directed in writing by the contracting officer, each JWS shall be submitted to the contracting officer for approval. The Contractor's Laboratory Director or designee shall provide a program mission impact statement and shall include an impact statement regarding related Intellectual Property rights known by the Contractor to be owned by the Government to assist the contracting officer in the approval determination.

(ii) The Contractor shall also include (specific to the proposed CRADA), a statement of compliance with the Fairness of Opportunity requirements of paragraph (e) of this clause.

(iii) Within thirty (30) days after submission of a JWS or proposed CRADA, the contracting officer shall approve, disapprove or request modification to the JWS or CRADA. The contracting officer shall provide a written explanation to the Contractor's Laboratory Director or designee of any disapproval or requirement for modification of a JWS or proposed CRADA.

(iv) Except as otherwise directed in writing by the contracting officer, the Contractor shall not enter into, or begin work under, a CRADA until approval of the CRADA has been granted by the contracting officer. The Contractor may submit its proposed CRADA to the contracting officer at the time of submitting its proposed JWS or any time thereafter.

(2) Selection of Participants. The Contractor's Laboratory Director or designee in deciding what CRADA to enter into shall:

(i) Give special consideration to small business firms, and consortia involving small business firms;

(ii) Give preference to business units located in the United States which agree that products or processes embodying Intellectual Property will be substantially manufactured or practiced in the United States

and, in the case of any industrial organization or other person subject to the control of a foreign company or government, take into consideration whether or not such foreign government permits United States agencies, organizations, or other persons to enter into cooperative research and development agreements and licensing agreements;

(iii) Provide Fairness of Opportunity in accordance with the requirements of paragraph (e) of this clause; and

(iv) Give consideration to the Conflicts of Interest requirements of paragraph (d) of this clause.

(3) Withholding of Data

(i) Data that is first produced as a result of research and development activities conducted under a CRADA and that would be a trade secret or commercial or financial data that would be privileged or confidential, if such data had been obtained from a non-Federal third party, may be protected from disclosure under the Freedom of Information Act as provided in the Stevenson- Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3710a(c)(7)) for a period as agreed in the CRADA of up to five (5)years from the time the data is first produced. The DOE shall cooperate with the Contractor in protecting such data.

(ii) Unless otherwise expressly approved by the contracting officer in advance for a specific CRADA, the Contractor agrees, at the request of the contracting officer, to transmit such data to other DOE facilities for use by DOE or its Contractors by or on behalf of the Government. When data protected pursuant to paragraph (n)(3)(i) of this clause is so transferred, the Contractor shall clearly mark the data with a legend setting out the restrictions against private use and further dissemination, along with the expiration date of such restrictions.

(iii) In addition to its authority to license Intellectual Property, the Contractor may enter into licensing agreements with third parties for data developed by the Contractor under a CRADA subject to other provisions of this Contract. However, the Contractor shall neither use the protection against dissemination nor the licensing of data as an alternative to the submittal of invention disclosures which include data protected pursuant to paragraph (n)(3)(i) of this clause.

(4) Work For Others and User Facility Programs

(i) WFO and User Facility Agreements (UFAs) are not CRADAs and will be available for use by the Contractor in addition to CRADAs for achieving utilization of employee expertise and unique facilities for maximizing technology transfer. The Contractor agrees to inform prospective CRADA participants, which are intending to substantially pay full cost recovery for the effort under a proposed CRADA, of the availability of alternative forms of agreements, i.e., WFO and UFA, and of the Class Patent Waiver provisions associated therewith.

(ii) Where the Contractor believes that the transfer of technology to the U.S. domestic economy will benefit from, or other equity considerations dictate, an arrangement other than the Class Waiver of patent rights to the sponsor in WFO and UFAs, a request may be made to the contracting officer for an exception to the Class Waivers.

(iii) Rights to inventions made under agreements other than funding agreements with third parties shall be governed by the appropriate provisions incorporated, with DOE approval, in such agreements, and the provisions in such agreements take precedence over any disposition of rights contained in this Contract. Disposition of rights under any such agreement shall be in accordance with any DOE class waiver (including Work for Others and User Class Waivers) or individually negotiated waiver which applies to the agreement.

(5) Conflicts of Interest

(i) Except as provided in paragraph (n)(5)(iii) of this clause, the Contractor shall assure that no employee of the Contractor shall have a substantial role (including an advisory role) in the preparation, negotiation, or approval of a CRADA, if, to such employee's knowledge:

(A) Such employee, or the spouse, child, parent, sibling, or partner of such employee, or an organization (other than the Contractor) in which such employee serves as an officer, director, trustee, partner, or employee --

(1) holds financial interest in any entity, other than the Contractor, that has a substantial interest in the preparation, negotiation, or approval of the CRADA;

(2) receives a gift or gratuity from any entity, other than the Contractor, that has a substantial interest in the preparation, negotiation, or approval of the CRADA; or

(B) A financial interest in any entity, other than the Contractor, that has a substantial interest in the preparation, negotiation, or approval of the CRADA, is held by any person or organization with whom such employee is negotiating or has any arrangement concerning prospective employment.

(ii) The Contractor shall require that each employee of the Contractor who has a substantial role (including an advisory role) in the preparation, negotiation, or approval of a CRADA certify through the Contractor to the contracting officer that the circumstances described in paragraph (n)(5)(i) of this clause do not apply to that employee.

(iii) The requirements of paragraphs (n)(5)(i) and (n)(5)(ii) of this clause shall not apply in a case where the contracting officer is advised by the Contractor in advance of the participation of an employee described in those paragraphs in the preparation, negotiation or approval of a CRADA of the nature of and extent of any financial interest described in paragraph (n)(5)(i) of this clause, and the contracting officer determines that such financial interest is not so substantial as to be considered likely to affect the integrity of the Contractor employee's participation in the process of preparing, negotiating, or approving the CRADA.

(o) Technology Transfer in Other Cost -Sharing Agreements.

In conducting research and development activities in cost-shared agreements not covered by paragraph (n) of this clause, the Contractor, with prior written permission of the contracting officer, may provide for the withholding of data produced thereunder in accordance with the applicable provisions of paragraph (n)(3) of this clause.

(p) Technology Partnership Ombudsman.

(1) The Contractor agrees to establish a position to be known as "Technology Partnership Ombudsman," to help resolve complaints from outside organizations regarding the policies and actions of the contractor with respect to technology partnerships (including CRADAs), patents owned by the contractor for inventions made at the laboratory, and technology licensing.

(2) The Ombudsman shall be a senior official of the Contractor's laboratory staff, who is not involved in day-to-day technology partnerships, patents or technology licensing, or if appointed from outside the laboratory or facility, shall function as such senior official.

(3) The duties of the Technology Partnership Ombudsman shall include:

(i) Serving as the focal point for assisting the public and industry in resolving complaints and disputes with the laboratory or facility regarding technology partnerships, patents, and technology licensing;

(ii) Promoting the use of collaborative alternative dispute resolution techniques such as mediation to facilitate the speedy and low cost resolution of complaints and disputes, when appropriate; and

(iii) Submitting a quarterly report, in a format provided by DOE, to the Secretary of Energy, the Administrator for Nuclear Security, the Director of the DOE Office of Dispute Resolution, and the Contracting Officer concerning the number and nature of complaints and disputes raised, along with the Ombudsman's assessment of their resolution, consistent with the protection of confidential and sensitive information.

CLAUSE I.93 - DEAR 970.5227-4 AUTHORIZATION AND CONSENT (AUG 2002)

(a) The Government authorizes and consents to all use and manufacture of any invention described in and covered by a United States patent in the performance of this contract or any subcontract at any tier.

(b) If the Contractor is sued for copyright infringement or anticipates the filing of such a lawsuit, the Contractor may request authorization and consent to copy a copyrighted work from the contracting officer. Programmatic necessity is a major consideration for DOE in determining whether to grant such request.

(c) (1) The Contractor agrees to include, and require inclusion of, the Authorization and Consent clause at 52.227-1, without Alternate 1, but suitably modified to identify the parties, in all subcontracts expected to exceed $100,000 at any tier for supplies or services, including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services.

(2) The Contractor agrees to include, and require inclusion of, paragraph (a) of this Authorization and Consent clause, suitably modified to identify the

parties, in all subcontracts at any tier for research and development activities expected to exceed $100,000.

(3) Omission of an authorization and consent clause from any subcontract, including those valued less than $100,000 does not affect this authorization and consent.

CLAUSE I.94 - DEAR 970.5227-5 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (DEC 2000) (includes modifications in final rule dated July 25, 2002)

(a) The Contractor shall report to the Contracting Officer promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this contract of which the Contractor has knowledge.

(b) If any person files a claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed hereunder, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Except where the Contractor has agreed to indemnify the Government, the Contractor shall furnish such evidence and information at the expense of the Government.

(c) The Contractor agrees to include, and require inclusion of, this clause suitably modified to identify the parties, in all subcontracts at any tier expected to exceed $100,000.

CLAUSE I.95 - DEAR 970.5227-6 PATENT INDEMNITY - SUBCONTRACTS (DEC 2000)

Except as otherwise authorized by the Contracting Officer, the Contractor shall obtain indemnification of the Government and its officers, agents, and employees against liability, including costs, for infringement of any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a secrecy order by the Government) from Contractor's subcontractors for any contract work subcontracted in accordance with FAR 48 CFR 52.227-3.

CLAUSE I.96 - DEAR 970.5227-8 REFUND OF ROYALTIES (AUG 2002)

(a) During performance of this Contract, if any royalties are proposed to be charged to the Government as costs under this Contract, the Contractor agrees to submit

for approval of the Contracting Officer, prior to the execution of any license, the following information relating to each separate item of royalty:

(1) Name and address of licensor;

(2) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable;

(3) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable;

(4) Percentage or dollar rate of royalty per unit;

(5) Unit price of contract item;

(6) Number of units;

(7) Total dollar amount of royalties; and

(8) A copy of the proposed license agreement.

(b) If specifically requested by the Contracting Officer, the Contractor shall furnish a copy of any license agreement entered into prior to the effective date of this clause and an identification of applicable claims of specific patents or other basis upon which royalties are payable.

(c) The term "royalties" as used in this clause refers to any costs or charges in the nature of royalties, license fees, patent or license amortization costs, or the like, for the use of or for rights in patents and patent applications that are used in the performance of this contract or any subcontract hereunder.

(d) The Contractor shall furnish to the Contracting Officer, annually upon request, a statement of royalties paid or required to be paid in connection with performing this Contract and subcontracts hereunder.

(e) For royalty payments under licenses entered into after the effective date of this Contract, costs incurred for royalties proposed under this paragraph shall be allowable only to the extent that such royalties are approved by the Contracting Officer. If the Contracting Officer determines that existing or proposed royalty payments are inappropriate, any payments subsequent to such determination shall be allowable only to the extent approved by the Contracting Officer.

(f) Regardless of prior DOE approval of any individual payments or royalties, DOE may contest at any time the enforceability, validity, scope of, or title to a patent for which Contractor makes a royalty or other payment.

(g) If at any time within 3 years after final payment under this contract, the Contractor for any reason is relieved in whole or in part from the payment of any royalties to which this clause applies, the Contractor shall promptly notify the Contracting Officer of that fact and shall promptly reimburse the Government for any refunds received or royalties paid after having received notice of such relief.

(h) The Contractor agrees to include, and require inclusion of, this clause, including this paragraph (h), suitably modified to identify the parties in any subcontract at any tier in which the amount of royalties reported during negotiation of the subcontract exceeds $250.

CLAUSE I.97 - DEAR 970.5227-10 PATENT RIGHTS - MANAGEMENT AND OPERATING CONTRACTS, NONPROFIT ORGANIZATION OR SMALL BUSINESS FIRM CONTRACTOR (DEC 2000) (includes modifications in final rule dated July 25, 2002)

(a) DEFINITIONS.

(1) *DOE licensing regulations* means the Department of Energy patent licensing regulations at 10 CFR Part 781.

(2) *Exceptional circumstance subject invention* means any subject invention in a technical field or related to a task determined by the Department of Energy to be subject to an exceptional circumstance under 35 U.S.C. 202(a)(ii) and in accordance with 37 CFR Part 401.3(e).

(3) *Invention* means any invention or discovery which is or may be patentable or otherwise protectable under Title 35 of the United States Code, or any novel variety of plant which is or may be protected under the Plant Variety Protection Act (7 U.S.C. 2321 *et seq.*).

(4) *Made* when used in relation to any invention means the conception or first actual reduction to practice of such invention.

(5) *Nonprofit organization* means a university or other institution of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute.

(6) *Patent Counsel* means the Department of Energy (DOE) Patent Counsel assisting the DOE contracting activity.

(7) *Practical application* means to manufacture, in the case of a composition or product; to practice, in the case of a process or method; or to operate, in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms.

(8) *Small business firm* means a small business concern as defined at section 2 of Pub. L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this clause, the size standards for small business concerns involved in Government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, are used.

(9) *Subject Invention* means any invention of the contractor conceived or first actually reduced to practice in the performance of work under this contract, provided that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act, 7 U.S.C. 2401(d)) shall also occur during the period of contract performance.

(b) ALLOCATION OF PRINCIPAL RIGHTS.

(1) *Retention of title by the Contractor.* Except for exceptional circumstance subject inventions, the contractor may retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this clause and 35 U.S.C. 203. With respect to any subject invention in which the Contractor retains title, the Federal government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world.

(2) *Exceptional circumstance subject inventions.* Except to the extent that rights are retained by the Contractor in a determination of exceptional circumstances or granted to a contractor through a determination of greater rights in accordance with subparagraph (b)(4) of this clause, the Contractor does not have a right to retain title to any exceptional circumstance subject inventions and agrees to assign to the Government the entire right, title, and interest, throughout the world, in and to any exceptional circumstance subject inventions.

(i) Inventions within or relating to the following fields of technology are exceptional circumstance subject inventions:

(A) uranium enrichment technology;

(B) storage and disposal of civilian high-level nuclear waste and spent fuel technology; and

(C) national security technologies classified or sensitive under Section 148 of the Atomic Energy Act (42 U.S.C. 2168).

(ii) Inventions made under any agreement, contract or subcontract related to the following are exceptional circumstance subject inventions:

(A) DOE Steel Initiative and Metals Initiative;

(B) U.S. Advanced Battery Consortium; and

(C) any funding agreement which is funded in part by the Electric Power Research Institute (EPRI) or the Gas Research Institute (GRI).

(iii) DOE reserves the right to unilaterally amend this contract to modify, by deletion or insertion, technical fields, tasks, or other classifications for the purpose of determining DOE exceptional circumstance subject inventions.

(3) *Treaties and international agreements.* Any rights acquired by the Contractor in subject inventions are subject to any disposition of right, title, or interest in or to subject inventions provided for in treaties or international agreements identified at Appendix J to this contract. DOE reserves the right to unilaterally amend this contract to identify specific treaties or international agreements entered into or to be entered into by the Government after the effective date of this contract and to effectuate those license or other rights which are necessary for the Government to meet its obligations to foreign governments, their nationals and international organizations under such treaties or international agreements with respect to subject inventions made after the date of the amendment.

(4) *Contractor request for greater rights in exceptional circumstance subject inventions.* The Contractor may request rights greater than allowed by the exceptional circumstance determination in an exceptional circumstance subject invention by submitting such a request in writing to Patent Counsel at the time the exceptional circumstance subject invention is disclosed to DOE or within eight (8) months after conception or first actual reduction to practice of the exceptional circumstance subject invention, whichever occurs first, unless a longer period is authorized in writing by the Patent Counsel for good cause shown in writing by the Contractor. DOE may, in its discretion, grant or refuse to grant such a request by the Contractor.

(5) *Contractor employee-inventor rights.* If the Contractor does not elect to retain title to a subject invention or does not request greater rights in an exceptional circumstance subject invention, a Contractor employee-inventor, after consultation with the Contractor and with written authorization from the Contractor in accordance with 10 CFR 784.9(b)(4), may request greater rights, including title, in the subject invention or the exceptional circumstance invention from DOE, and DOE may, in its discretion, grant or refuse to grant such a request by the Contractor employee-inventor.

(6) *Government assignment of rights in Government employees' subject inventions.* If a Government employee is a joint inventor of a subject invention or of an exceptional circumstance subject invention to which the Contractor has rights, the Government may assign or refuse to assign to the Contractor any rights in the subject invention or exceptional circumstance subject invention acquired by the Government from the Government employee, in accordance with 48 CFR 27.304-1(d). The rights assigned to the Contractor are subject to any provision of this clause that is applicable to subject inventions in which the Contractor retains title, including reservation by the Government of a nonexclusive, nontransferable, irrevocable, paid-up license, except that the Contractor shall file its initial patent application claiming the subject invention or exceptional circumstance invention within one (1) year after the assignment of such rights. The Contractor shall share royalties collected for the manufacture, use or sale of the subject invention with the Government employee.

(c) SUBJECT INVENTION DISCLOSURE, ELECTION OF TITLE AND FILING OF PATENT APPLICATION BY CONTRACTOR.

(1) *Subject invention disclosure.* The contractor will disclose each subject invention to the Patent Counsel within two months after the inventor discloses it in writing to contractor personnel responsible for patent matters. The disclosure to the agency shall be in the form of a written report and shall identify the contract under which the invention was made and the inventor(s) and all sources of funding by B&R code for the invention. It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. The disclosure shall include a written statement as to whether the invention falls within an exceptional circumstance field. DOE will make a

determination and advise the Contractor within 30 days of receipt of an invention disclosure as to whether the invention is an exceptional circumstance subject invention. In addition, after disclosure to the Patent Counsel, the Contractor will promptly notify the agency of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the contractor. The Contractor shall obtain approval from Patent Counsel prior to any release or publication of information concerning any nonelectable subject invention such as an exceptional circumstance subject invention or any subject invention related to a treaty or international agreement.

(2) *Election by the Contractor.* Except as provided in paragraph (b)(2) of this clause, the Contractor will elect in writing whether or not to retain title to any such invention by notifying the Federal agency within two years of disclosure to the Federal agency. However, in any case where publication, on sale or public use has initiated the one year statutory period wherein valid patent protection can still be obtained in the United States, the period for election of title may be shortened by the agency to a date that is no more than 60 days prior to the end of the statutory period.

(3) *Filing of patent applications by the Contractor.* The Contractor will file its initial patent application on a subject invention to which it elects to retain title within one year after election of title or, if earlier, or prior to the end of any 1-year statutory period wherein valid patent protection can be obtained in the United States after a publication, on sale, or public use. The Contractor will file patent applications in additional countries or international patent offices within either ten months of the corresponding initial patent application or six months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications where such filing has been prohibited by a Secrecy Order.

(4) *Contractor's request for an extension of time.* Requests for an extension of the time for disclosure, election, and filing under subparagraphs (c)(1), (2) and (3) may, at the discretion of Patent Counsel, be granted.

(5) *Publication Approval.* During the course of the work under this contract, the Contractor or its employees may desire to release or publish information regarding scientific or technical developments conceived or first actually reduced to practice in the course of or under this contract. In order that public disclosure of such information will not adversely affect the patent interest of DOE or the Contractor, approval for release or publication shall be secured from the Contractor personnel responsible for patent matters prior to any such release or publication. Where DOE's approval of publication is requested, DOE's response to such requests for approval shall normally be provided within 90 days except in

circumstances in which a domestic patent application must be filed in order to protect foreign rights. In the case involving foreign patent rights, DOE shall be granted an additional 180 days with which to respond to the request for approval, unless extended by mutual agreement.

(d) CONDITIONS WHEN THE GOVERNMENT MAY OBTAIN TITLE.

The Contractor will convey to the DOE, upon written request, title to any subject invention --

(1) If the Contractor fails to disclose or elect title to the subject invention within the times specified in paragraph (c) of this clause, or elects not to retain title; provided, that DOE may only request title within sixty (60) days after learning of the failure of the Contractor to disclose or to elect within the specified times.

(2) In those countries in which the Contractor fails to file a patent application within the times specified in subparagraph (c) of this clause; provided, however, that if the Contractor has filed a patent application in a country after the times specified in subparagraph (c) above, but prior to its receipt of the written request of the DOE, the Contractor shall continue to retain title in that country.

(3) In any country in which the Contractor decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in a reexamination or opposition proceeding on, a patent on a subject invention.

(4) If the Contractor requests that DOE acquire title or rights from the Contractor in a subject invention to which the Contractor had initially retained title or rights, or in an exceptional circumstance subject invention to which the Contractor was granted greater rights, DOE may acquire such title or rights from the Contractor, or DOE may decide against acquiring such title or rights from the Contractor, at DOE's sole discretion.

(e) MINIMUM RIGHTS OF THE CONTRACTOR AND PROTECTION OF THE CONTRACTOR'S RIGHT TO FILE.

(1) *Request for a Contractor license.* The Contractor may request the right to reserve a revocable, nonexclusive, royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the Contractor fails to disclose the invention within the times specified in paragraph (c) of this clause. DOE may grant or refuse to grant such a request by the Contractor. When DOE approves such reservation, the Contractor's license will normally extend to its domestic subsidiaries

and affiliates, if any, within the corporate structure of which the Contractor is a party and includes the right to grant sublicenses of the same scope to the extent the Contractor was legally obligated to do so at the time the contract was awarded. The license is transferable only with the approval of DOE, except when transferred to the successor of that part of the contractor's business to which the invention pertains.

(2) *Revocation or modification of a Contractor license.* The Contractor's domestic license may be revoked or modified by DOE to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions at 37 CFR Part 404 and DOE licensing regulations at 10 CFR Part 781. This license will not be revoked in the field of use or the geographical areas in which the Contractor has achieved practical application and continues to make the benefits of the subject invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of DOE to the extent the Contractor, its licensees, or the domestic subsidiaries or affiliates have failed to achieve practical application of the subject invention in that foreign country.

(3) *Notice of revocation of modification of a Contractor license.* Before revocation or modification of the license, DOE will furnish the Contractor a written notice of its intention to revoke or modify the license, and the Contractor will be allowed thirty days (or such other time as may be authorized by DOE for good cause shown by the Contractor) after the notice to show cause why the license should not be revoked or modified. The Contractor has the right to appeal, in accordance with applicable regulations in 37 CFR Part 404 and DOE licensing regulations at 10 CFR Part 781 concerning the licensing of Government owned inventions, any decision concerning the revocation or modification of the license.

(f) CONTRACTOR ACTION TO PROTECT THE GOVERNMENT'S INTEREST.

(1) *Execution of delivery of title or license instruments.* The Contractor agrees to execute or to have executed, and promptly deliver to the Patent Counsel all instruments necessary to accomplish the following actions:

(i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the Contractor elects to retain title, and

(ii) convey title to DOE when requested under subparagraphs (b) or paragraph (d) of this clause and to enable the Government to obtain patent protection throughout the world in that subject invention.

(2) *Contractor employee agreements.* The Contractor agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to Contractor personnel identified as responsible for the administration of patent matters and in a format suggested by the Contractor, each subject invention made under this contract in order that the Contractor can comply with the disclosure provisions of paragraph (c) of this clause, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by subparagraph (c)(1) of this clause. The Contractor shall instruct such employees, through employee agreements or other suitable educational programs, on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

(3) *Notification of discontinuation of patent protection.* The contractor will notify the Patent Counsel of any decision not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than thirty days before the expiration of the response period required by the relevant patent office.

(4) *Notification of Government rights.* The contractor agrees to include, within the specification of any United States patent applications and any patent issuing thereon covering a subject invention, the following statement, "This invention was made with government support under (identify the contract) awarded by (identify the Federal agency). The government has certain rights in the invention."

(5) *Invention Identification Procedures.* The Contractor shall establish and maintain active and effective procedures to ensure that subject inventions are promptly identified and timely disclosed and shall submit a written description of such procedures to the Contracting Officer so that the Contracting Officer may evaluate and determine their effectiveness.

(6) *Invention Filing Documentation.* If the Contractor files a domestic or foreign patent application claiming a subject invention, the Contractor shall promptly submit to Patent Counsel, upon request, the following information and documents:

(i) the filing date, serial number, title, and a copy of the patent application (including an English-language version if filed in a language other than English);

(ii) an executed and approved instrument fully confirmatory of all Government rights in the subject invention; and

(iii) the patent number, issue date, and a copy of any issued patent claiming the subject invention.

(7) *Duplication and disclosure of documents.* The Government may duplicate and disclose subject invention disclosures and all other reports and papers furnished or required to be furnished pursuant to this clause; provided, however, that any such duplication or disclosure by the Government is subject to the confidentiality provision at 35 U.S.C. 205 and 37 CFR Part 40.

(g) SUBCONTRACTS.

(1) *Subcontractor subject inventions.* The Contractor shall not obtain rights in the subcontractor's subject inventions as part of the consideration for awarding a subcontract.

(2) *Inclusion of patent rights clause - non-profit organization or small business firm subcontractors.* Unless otherwise authorized or directed by the Contracting Officer, the Contractor shall include the patent rights clause at 48 CFR 952.227-11, suitably modified to identify the parties, in all subcontracts, at any tier, for experimental, developmental, demonstration or research work to be performed by a small business firm or domestic nonprofit organization, except subcontracts which are subject to exceptional circumstances in accordance with 35 U.S.C. 202 and subparagraph (b)(2) of this clause. The subcontractor retains all rights provided for the contractor in the patent rights clause at 48 CFR 952.227-11.

(3) *Inclusion of patent rights clause - subcontractors other than non-profit organizations and small business firms.* Except for the subcontracts described in subparagraph (g)(2) of this clause, the Contractor shall include the patent rights clause at 48 CFR 952.227-13, suitably modified to identify the parties, in any contract for experimental, developmental, demonstration or research work. For subcontracts subject to exceptional circumstances, the contractor must consult with DOE patent counsel with respect to the appropriate patent clause.

(4) *DOE and subcontractor contract.* With respect to subcontracts at any tier, DOE, the subcontractor, and the Contractor agree that the mutual obligations of the parties created by this clause constitute a contract between the subcontractor and DOE with respect to the matters covered by the clause; provided, however, that nothing in this paragraph is

intended to confer any jurisdiction under the Contract Disputes Act in connection with proceedings under paragraph (j) of this clause.

(5) *Subcontractor refusal to accept terms of patent clause.* If a prospective subcontractor refuses to accept the terms of a patent rights clause, the Contractor shall promptly submit a written notice to the Contracting Officer stating the subcontractor's reasons for such a refusal, including any relevant information for expediting disposition of the matter, and the Contractor shall not proceed with the subcontract without the written authorization of the Contracting Officer.

(6) *Notification of award of subcontract.* Upon the award of any subcontract at any tier containing a patent rights clause, the Contractor shall promptly notify the Contracting Officer in writing and identify the subcontractor, the applicable patent rights clause, the work to be performed under the subcontract, and the dates of award and estimated completion. Upon request of the Contracting Officer, the Contractor shall furnish a copy of a subcontract.

(7) *Identification of subcontractor subject inventions.* If the Contractor in the performance of this contract becomes aware of a subject invention made under a subcontract, the Contractor shall promptly notify Patent Counsel and identify the subject invention.

(h) REPORTING ON UTILIZATION OF SUBJECT INVENTIONS.

The Contractor agrees to submit to DOE on request, periodic reports, no more frequently than annually, on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Contractor or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Contractor, and such other data and information as DOE may reasonably specify. The Contractor also agrees to provide additional reports as may be requested by DOE in connection with any march-in proceeding undertaken by DOE in accordance with paragraph (j) of this clause. As required by 35 U.S.C. 202(c)(5), DOE agrees it will not disclose such information to persons outside the Government without permission of the Contractor.

(i) PREFERENCE FOR UNITED STATES INDUSTRY.

Notwithstanding any other provision of this clause, the Contractor agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any product embodying the subject invention or produced through the use of the subject invention will be manufactured substantially in the United States.

However, in individual cases, the requirement for such an agreement may be waived by DOE upon a showing by the Contractor or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

(j) MARCH-IN RIGHTS.

The Contractor agrees that, with respect to any subject invention in which it has acquired title, DOE has the right in accordance with the procedures in 37 CFR 401.6 and any DOE supplemental regulations to require the Contractor, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and, if the Contractor, assignee or exclusive licensee refuses such a request, DOE has the right to grant such a license itself if DOE determines that --

(1) Such action is necessary because the Contractor or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

(2) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Contractor, assignee, or their licensees;

(3) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the Contractor, assignee, or licensees; or

(4) Such action is necessary because the agreement required by paragraph (i) of this clause has not been obtained or waived, or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement.

(k) SPECIAL PROVISIONS FOR CONTRACTS WITH NONPROFIT ORGANIZATIONS.

If the Contractor is a nonprofit organization, it agrees that --

(1) *DOE approval of assignment of rights.* Rights to a subject invention in the United States may not be assigned by the Contractor without the approval of DOE, except where such assignment is made to an organization which has as one of its primary functions the management of inventions; provided, that such assignee will be subject to the same provisions of this clause as the Contractor.

(2) *Small business firm licensees.* It will make efforts that are reasonable under the circumstances to attract licensees of subject inventions that are small business firms, and that it will give a preference to a small business firm when licensing a subject invention if the Contractor determines that the small business firm has a plan or proposal for marketing the invention which, if executed, is equally as likely to bring the invention to practical application as any plans or proposals from applicants that are not small business firms; provided, that the Contractor is also satisfied that the small business firm has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the Contractor. However, the Contractor agrees that the Secretary of Commerce may review the Contractor's licensing program and decisions regarding small business firm applicants, and the Contractor will negotiate changes to its licensing policies, procedures, or practices with the Secretary of Commerce when that Secretary's review discloses that the Contractor could take reasonable steps to more effectively implement the requirements of this subparagraph (k)(2).

(3) *Contractor licensing of subject inventions.* To the extent that it provides the most effective technology transfer, licensing of subject inventions shall be administered by Contractor employees on location at the facility.

(l) COMMUNICATIONS.

The Contractor shall direct any notification, disclosure or request provided for in this clause to the Patent Counsel assisting the DOE contracting activity.

(m) REPORTS.

(1) *Interim reports.* Upon DOE's request, the Contractor shall submit to DOE, no more frequently than annually, a list of subject inventions disclosed to DOE during a specified period, or a statement that no subject inventions were made during the specified period; and a list of subcontracts containing a patent clause and awarded by the Contractor during a specified period, or a statement that no such subcontracts were awarded during the specified period.

(2) *Final reports.* Upon DOE's request, the Contractor shall submit to DOE, prior to closeout of the contract, a list of all subject inventions disclosed during the performance period of the contract, or a statement that no subject inventions were made during the contract performance period; and a list of all subcontracts containing a patent clause and awarded by the Contractor during the contract performance period, or a statement that no such subcontracts were awarded during the contract performance period.

(n) EXAMINATION OF RECORDS RELATING TO SUBJECT INVENTIONS.

(1) *Contractor compliance.* Until the expiration of three (3) years after final payment under this contract, the Contracting Officer or any authorized representative may examine any books (including laboratory notebooks), records, documents, and other supporting data of the Contractor, which the Contracting Officer or authorized representative deems reasonably pertinent to the discovery or identification of subject inventions, including exceptional circumstance subject inventions, or to determine Contractor compliance with any requirement of this clause.

(2) *Unreported inventions.* If the Contracting Officer is aware of an invention that is not disclosed by the Contractor to DOE, and the Contracting Officer believes the unreported invention may be a subject invention, including exceptional circumstance subject inventions, DOE may require the Contractor to submit to DOE a disclosure of the invention for a determination of ownership rights.

(3) *Confidentiality.* Any examination of records under this paragraph is subject to appropriate conditions to protect the confidentiality of the information involved.

(4) *Power of inspection.* With respect to a subject invention for which the Contractor has responsibility for patent prosecution, the Contractor shall furnish the Government, upon request by DOE, an irrevocable power to inspect and make copies of a prosecution file for any patent application claiming the subject invention.

(o) FACILITIES LICENSE.

In addition to the rights of the parties with respect to inventions or discoveries conceived or first actually reduced to practice in the course of or under this contract, the Contractor agrees to and does hereby grant to the Government an irrevocable, nonexclusive, paid-up license in and to any inventions or discoveries regardless of when conceived or actually reduced to practice or acquired by the Contractor at any time through completion of this contract and which are incorporated or embodied in the construction of the facility or which are utilized in the operation of the facility or which cover articles, materials, or product manufactured at the facility (1) to practice or have practiced by or for the Government at the facility, and (2) to transfer such license with the transfer of that facility. Notwithstanding the acceptance or exercise by the Government of these rights, the Government may contest at any time the enforceability, validity or scope of, or title to, any rights or patents herein licensed.

(p) ATOMIC ENERGY.

(1) *Pecuniary awards.* No claim for pecuniary award of compensation under the provisions of the Atomic Energy Act of 1954, as amended, may be asserted with respect to any invention or discovery made or conceived in the course of or under this contract.

(2) *Patent agreements.* Except as otherwise authorized in writing by the Contracting Officer, the Contractor shall obtain patent agreements to effectuate the provisions of subparagraph (p)(1) of this clause from all persons who perform any part of the work under this contract, except nontechnical personnel, such as clerical employees and manual laborers.

(q) CLASSIFIED INVENTIONS.

(1) *Approval for filing a foreign patent application.* The Contractor shall not file or cause to be filed an application or registration for a patent disclosing a subject invention related to classified subject matter in any country other than the United States without first obtaining the written approval of the Contracting Officer.

(2) *Transmission of classified subject matter.* If in accordance with this clause the Contractor files a patent application in the United States disclosing a subject invention that is classified for reasons of security, the Contractor shall observe all applicable security regulations covering the transmission of classified subject matter. If the Contractor transmits a patent application disclosing a classified subject invention to the United States Patent and Trademark Office (USPTO), the Contractor shall submit a separate letter to the USPTO identifying the contract or contracts by agency and agreement number that require security classification markings to be placed on the patent application.

(3) Inclusion of clause in subcontracts. The Contractor agrees to include the substance of this clause in subcontracts at any tier that cover or are likely to cover subject matter classified for reasons of security.

(r) PATENT FUNCTIONS.

Upon the written request of the Contracting Officer or Patent Counsel, the Contractor agrees to make reasonable efforts to support DOE in accomplishing patent-related functions for work arising out of the contract, including, but not limited to, the prosecution of patent applications, and the determination of questions of novelty, patentability, and inventorship.

(s) EDUCATIONAL AWARDS SUBJECT TO 35 U.S.C. 212.

The Contractor shall notify the Contracting Officer prior to the placement of any person subject to 35 U.S.C. 212 in an area of technology or task (1) related to exceptional circumstance technology or (2) which is subject to treaties or international agreements as set forth in paragraph (b)(3) of this clause or agreements other than funding agreements. The Contracting Officer may disapprove of any such placement.

(t) ANNUAL APPRAISAL BY PATENT COUNSEL.

Patent Counsel may conduct an annual appraisal to evaluate the Contractor's effectiveness in identifying and protecting subject inventions in accordance with DOE policy.

CLAUSE I.98 - DEAR 970.5228-1 INSURANCE--LITIGATION AND CLAIMS (DEC 2000) (DEVIATION) (includes Modifications in final rule dated January 18, 2001 and in final rule dated March 28, 2002)

(a) The contractor may, with the prior written authorization of the contracting officer, and shall, upon the request of the Government, initiate litigation against third parties, including proceedings before administrative agencies, in connection with this contract. The contractor shall proceed with such litigation in good faith and as directed from time to time by the contracting officer.

(b) The contractor shall give the contracting officer immediate notice in writing of any legal proceeding, including any proceeding before an administrative agency, filed against the contractor arising out of the performance of this contract. Except as otherwise directed by the contracting officer, in writing, the contractor shall furnish immediately to the contracting officer copies of all pertinent papers received by the contractor with respect to such action. The contractor, with the prior written authorization of the contracting officer, shall proceed with such litigation in good faith and as directed from time to time by the contracting officer.

(c) (1) Except as provided in paragraph (c)(2) of this clause, the contractor shall procure and maintain such bonds and insurance as required by law or approved in writing by the contracting officer.

(2) The contractor may, with the approval of the contracting officer, maintain a self-insurance program; provided that, with respect to workers' compensation, the contractor is qualified pursuant to statutory authority.

(3) All bonds and insurance required by this clause shall be in a form and amount and for those periods as the contracting officer may require or approve and with sureties and insurers approved by the contracting officer.

(d) The contractor agrees to submit for the contracting officer's approval, to the extent and in the manner required by the contracting officer, any other bonds and insurance that are maintained by the contractor in connection with the performance of this contract and for which the contractor seeks reimbursement. If an insurance cost (whether a premium for commercial insurance or related to self-insurance) includes a portion covering costs made unallowable elsewhere in the contract, and the share of the cost for coverage for the unallowable cost is determinable, the portion of the cost that is otherwise an allowable cost under this contract is reimbursable to the extent determined by the contracting officer.

(e) Except as provided in subparagraphs (g) and (h) of this clause, or specifically disallowed elsewhere in this contract, the contractor shall be reimbursed--

(1) For that portion of the reasonable cost of bonds and insurance allocable to this contract required in accordance with contract terms or approved under this clause, and

(2) For liabilities (and reasonable expenses incidental to such liabilities, including litigation costs) to third persons not compensated by insurance or otherwise without regard to and as an exception to the clause of this contract entitled, "Obligation of Funds."

(f) The Government's liability under paragraph (e) of this clause is subject to the availability of appropriated funds. Nothing in this contract shall be construed as implying that the Congress will, at a later date, appropriate funds sufficient to meet deficiencies.

(g) Notwithstanding any other provision of this contract, the contractor shall not be reimbursed for liabilities (and expenses incidental to such liabilities, including litigation costs, counsel fees, judgment and settlements)--

(1) Which are otherwise unallowable by law or the provisions of this contract; or

(2) For which the contractor has failed to insure or to maintain insurance as required by law, this contract, or by the written direction of the contracting officer.

(h) In addition to the cost reimbursement limitations contained in 48 CFR part 31, as supplemented by 48 CFR 970.31, and notwithstanding any other provision of this contract, the contractor's liabilities to third persons, including employees but

excluding costs incidental to worker's compensation actions, (and any expenses incidental to such liabilities, including litigation costs, counsel fees, judgments and settlements) shall not be reimbursed if such liabilities were caused by contractor managerial personnel's --

(1) Willful misconduct, or

(2) Lack of good faith.

(3) Failure to exercise prudent business judgment, which means failure to act in the same manner as a prudent person in the conduct of competitive business; or, in the case of a non-profit educational institution, failure to act in the manner that a prudent person would under the circumstances prevailing at the time the decision to incur the cost is made.

(i) The burden of proof shall be upon the contractor to establish that costs covered by paragraph (h) of this clause are allowable and reasonable if, after an initial review of the facts, the contracting officer challenges a specific cost or informs the contractor that there is reason to believe that the cost results from willful misconduct, lack of good faith, or failure to exercise prudent business judgment by contractor managerial personnel.

(j) (1) All litigation costs, including counsel fees, judgments and settlements shall be differentiated and accounted for by the contractor so as to be separately identifiable. If the contracting officer provisionally disallows such costs, then the contractor may not use funds advanced by DOE under the contract to finance the litigation.

(2) Punitive damages are not allowable unless the act or failure to act which gave rise to the liability resulted from compliance with specific terms and conditions of the contract or written instructions from the contracting officer.

(3) The portion of the cost of insurance obtained by the contractor that is allocable to coverage of liabilities referred to in paragraph (g)(1) of this clause is not allowable.

(4) The term "contractor's managerial personnel" is defined in the Property clause in this contract.

(k) The contractor may at its own expense and not as an allowable cost procure for its own protection insurance to compensate the contractor for any unallowable or unreimbursable costs incurred in connection with contract performance.

(l) If any suit or action is filed or any claim is made against the contractor, the cost and expense of which may be reimbursable to the contractor under this contract,

and the risk of which is then uninsured or is insured for less than the amount claimed, the contractor shall --

(1) Immediately notify the contracting officer and promptly furnish copies of all pertinent papers received;

(2) Authorize Department representatives to collaborate with: in-house or DOE-approved outside counsel in settling or defending the claim; or counsel for the insurance carrier in settling or defending the claim if the amount of the liability claimed exceeds the amount of coverage, unless precluded by the terms of the insurance contract; and

(3) Authorize Department representatives to settle the claim or to defend or represent the contractor in and/or to take charge of any litigation, if required by the Department, if the liability is not insured or covered by bond. In any action against more than one Department contractor, the Department may require the contractor to be represented by common counsel. Counsel for the contractor may, at the contractor's own expense, be associated with the Department representatives in any such claim or litigation.

CLAUSE I.99 - DEAR 970.5229-1 STATE AND LOCAL TAXES (DEC 2000)

(a) The contractor agrees to notify the contracting officer of any State or local tax, fee, or charge levied or purported to be levied on or collected from the contractor with respect to the contract work, any transaction thereunder, or property in the custody or control of the contractor and constituting an allowable item of cost if due and payable, but which the contractor has reason to believe, or the contracting officer has advised the contractor, is or may be inapplicable or invalid; and the contractor further agrees to refrain from paying any such tax, fee, or charge unless authorized in writing by the contracting officer. Any State or local tax, fee, or charge paid with the approval of the contracting officer or on the basis of advice from the contracting officer that such tax, fee, or charge is applicable and valid, and which would otherwise be an allowable item of cost, shall not be disallowed as an item of cost by reason of any subsequent ruling or determination that such tax, fee, or charge was in fact inapplicable or invalid.

(b) The contractor agrees to take such action as may be required or approved by the contracting officer to cause any State or local tax, fee, or charge which would be an allowable cost to be paid under protest; and to take such action as may be required or approved by the contracting officer to seek recovery of any payments made, including assignment to the Government or its designee of all rights to an abatement or refund thereof, and granting permission for the Government to join with the contractor in any proceedings for the recovery thereof or to sue for

recovery in the name of the contractor. If the contracting officer directs the contractor to institute litigation to enjoin the collection of or to recover payment of any such tax, fee, or charge referred to above, or if a claim or suit is filed against the contractor for a tax, fee, or charge it has refrained from paying in accordance with this clause, the procedures and requirements of the clause entitled "Insurance-Litigation and Claims" shall apply and the costs and expenses incurred by the contractor shall be allowable items of costs, as provided in this contract, together with the amount of any judgment rendered against the contractor.

(c) The Government shall hold the contractor harmless from penalties and interest incurred through compliance with this clause. All recoveries or credits in respect of the foregoing taxes, fees, and charges (including interest) shall inure to and be for the sole benefit of the Government.

CLAUSE I.100 - DEAR 970.5204-75 PREEXISTING CONDITIONS (JUN 1997) (ALTERNATE II) (JUN 1997)

(a) DOE agrees to reimburse the Contractor, and the Contractor shall not be held responsible, for any liability (including without limitation, a claim involving strict or absolute liability and any civil fine or penalty), expense, or remediation cost, but limited to those of a civil nature, which may be incurred by, imposed on, or asserted against the Contractor arising out of any condition, act, or failure to act which occurred before the Contractor assumed responsibility for the Laboratory at the completion of the Transition Activities which occurred on March 1, 1998. To the extent the acts or omissions of the Contractor cause or add to any liability, expense or remediation cost resulting from conditions in existence prior to completion of the Transition Activities, the Contractor shall be responsible in accordance with the terms and conditions of this contract.

(b) The obligations of the Department of Energy under this clause are subject to the availability of appropriated funds.

(c) The Contractor has the duty to inspect the facilities and sites and timely identify to the Contracting Officer those conditions which it believes could give rise to a liability, obligation, loss, damage, penalty, fine, claim, action, suit, cost, expense, or disbursement or areas of actual or potential noncompliance with the terms and conditions of this contract or applicable law or regulation. The Contractor has the responsibility to take corrective action, as directed by the Contracting Officer and as required elsewhere in this contract.

CLAUSE I.101 - DEAR 970.5232-1 REDUCTION OR SUSPENSION OF ADVANCE, PARTIAL, OR PROGRESS PAYMENTS (DEC 2000)

(a) The contracting officer may reduce or suspend further advance, partial, or progress payments to the contractor upon a written determination by the Senior Procurement Executive that substantial evidence exists that the Contractor's request for advance, partial, or progress payment is based on fraud.

(b) The Contractor shall be afforded a reasonable opportunity to respond in writing.

CLAUSE I.102 - DEAR 970.5204-16 (AL 93-2) PAYMENTS AND ADVANCES (JUN 1997) (MODIFIED)

(a) Installments of fixed-fee. Ninety percent (90%) of the fixed-fee shall become due and payable in periodic installments in amounts based on the proportion of the work then completed, as determined by the Contracting Officer, and the balance upon completion and acceptance of all work under this contract. Fee payments shall be made by direct payment or withdrawn from funds advanced or available under this contract, as determined by the Contracting Officer. The Contracting Officer may offset against any such fee payment, the amounts owed to the Government by the Contractor, including any amounts owed for disallowed costs under this contract. No fee payment may be withdrawn against the payments cleared financing arrangement without prior written approval of the Contracting Officer.

(b) Payments on Account of Allowable Costs. The Contracting Officer and the Contractor shall agree as to the extent to which payment for allowable costs or payments for other items specifically approved, in writing, by the Contracting Officer shall be made from advances of Government funds. When pension contributions are paid by the Contractor to the retirement fund less frequently than quarterly, accrued costs therefor shall be excluded from costs for payment purposes until such costs are paid. If pension contributions are paid on a quarterly or more frequent basis, accrual therefor may be included in costs for payment purposes, provided that they are paid to the fund within 30 days after the close of the period covered. If payments are not made to the fund within such 30-day period, pension contribution costs shall be excluded from cost for payment purposes until payment has been made.

(c) Special financial institution account-use. All advances of Government funds shall be withdrawn pursuant to a payments cleared financing arrangement prescribed by DOE in favor of the financial institution or, in the option of the Government, shall be made by direct payment or any other payment mechanism to the Contractor, and shall be deposited only in the Special Financial Institution Account referred to in the Special Financial Institution Account Agreement, which

is incorporated into this contract as Appendix C. No part of the funds in the Special Financial Institution Account shall be (1) commingled with any funds of the Contractor or (2) used for a purpose other than that of making payments for costs allowable under this contract, and fixed fee or performance fees earned under this contract, or payments for other items specifically approved, in writing, by the Contracting Officer. If the Contracting Officer shall at any time determine that the balance of such special financial institution account exceeds the Contractor's current needs, the Contractor shall promptly make such disposition of the excess as the Contracting Officer may direct.

(d) Title to funds advanced. Title to the unexpended balance of any funds advanced and of any special financial institution account established pursuant to this clause shall remain in the Government and be superior to any claim or lien of the financial institution of deposit or others. It is understood that an advance to the Contractor hereunder is not a loan to the Contractor, and will not require the payment of interest by the Contractor, and that the Contractor acquires no right, title or interest in or to such advance other than the right to make expenditures therefrom, as provided in this Clause.

(e) Review and approval of costs incurred. The Contractor shall prepare and submit annually as of September 30, a voucher for the total of net expenditures accrued (i.e., net costs incurred) for the period covered by the voucher. The Contractor shall certify the voucher subject to the penalty provisions for unallowable costs as stated in Sections 306 (b) and (h) of the Federal Property and Administrative Services Act of 1949 (41 U.S.C. 256), as amended. DOE, after audit and appropriate adjustment, will approve such voucher. This approval by DOE will constitute an acknowledgment by DOE that the net costs incurred are allowable under the contract and that they have been recorded in the accounts maintained by the Contractor in accordance with DOE accounting policies, but will not relieve the Contractor of responsibility for DOE's assets in its care, for appropriate subsequent adjustments, or for errors later becoming known to DOE.

(f) Financial settlement. The Government shall promptly pay to the Contractor the unpaid balance of allowable costs, and fixed fee or performance fees earned upon termination of the work, expiration of the term of the contract, or completion of the work and its acceptance by the Government after (1) compliance by the Contractor with DOE's patent clearance requirements, and (2) the furnishing by the Contractor of:

(i) An assignment of the Contractor's rights to any refunds, rebates, allowances, accounts receivable, collections accruing to the Contractor in connection with the work under this contract, or other credits applicable to allowable costs under the contract;

(ii) A closing financial statement;

(iii) The accounting for Government-owned property required by the Clause entitled, "Property"; and

(iv) A release discharging the Government, its officers, agents, and employees from all liabilities, obligations, and claims arising out of or under this contract subject only to the following exceptions:

(A) Specified claims in stated amounts or in estimated amounts where the amounts are not susceptible to exact statement by the Contractor;

(B) Claims, together with reasonable expenses incidental thereto, based upon liabilities of the Contractor to third parties arising out of the performance of this contract; provided that such claims are not known to the Contractor on the date of the execution of the release; and provided further that the Contractor gives notice of such claims, in writing, to the Contracting Officer promptly, but not more than one (1) year after the Contractor's right of action first accrues. In addition, the Contractor should provide prompt notice to the Contracting Officer of all potential claims under this clause, whether in litigation or not (see also Contract Clause I.98, DEAR 970.5228-1, "Insurance--Litigation and Claims");

(C) Claims for reimbursement of costs (other than expenses of the Contractor by reason of any indemnification of the Government against patent liability), including reasonable expenses incidental thereto, incurred by the Contractor under the provisions of this contract relating to patents; and

(D) Claims recognizable under the Article entitled, "Nuclear Hazards Indemnity Agreement".

In arriving at the amount due the Contractor under this Clause, there shall be deducted, (1) any claim which the Government may have against the Contractor in connection with this contract, and (2) deductions due under the terms of this contract, and not otherwise recovered by or credited to the Government. The unliquidated balance of the Special Financial Institution Account may be applied to the amount due and any balance shall be returned to the Government forthwith.

(g) Claims. Claims for credit against funds advanced for payment shall be accompanied by such supporting documents and justification as the Contracting Officer shall prescribe.

(h) Discounts. The Contractor shall take and afford the Government the advantage of all known and available cash and trade discounts, rebates, allowances, credits, salvage, and commissions unless the Contracting Officer finds that action is not in the best interest of the Government.

(i) Collections. All collections accruing to the Contractor in connection with the work under this contract, except for the Contractor's fixed fee or performance fees earned, and royalties or other income accruing to the Contractor from technology transfer activities in accordance with this contract, shall be Government property and shall be processed and accounted for in accordance with applicable requirements imposed by the Contracting Officer pursuant to Clause I.79, Laws, Regulations and DOE Directives, and to the extent consistent with those requirements shall be deposited in the Special Financial Institutional Account or otherwise made available for payment of allowable costs under this contract, unless otherwise directed by the Contracting Officer.

(j) Direct payment of charges. The Government reserves the right, upon ten days written notice from the Contracting Officer to the Contractor, to pay directly to the persons concerned, all amounts due which otherwise would be allowable under this contract. Any payment so made shall discharge the Government of all liability to the Contractor therefor.

CLAUSE I.103 - DEAR 970.5232-3 ACCOUNTS, RECORDS, AND INSPECTION (DEC 2000) (ALTERNATE II) (DEC 2000)

(a) Accounts. The contractor shall maintain a separate and distinct set of accounts, records, documents, and other evidence showing and supporting: all allowable costs incurred; collections accruing to the contractor in connection with the work under this contract, other applicable credits, negotiated fixed amounts, and fee accruals under this contract, and the receipt, use, and disposition of all Government property coming into the possession of the contractor under this contract. The system of accounts employed by the contractor shall be satisfactory to DOE and in accordance with generally accepted accounting principles consistently applied.

(b) Inspection and audit of accounts and records. All books of account and records relating to this contract shall be subject to inspection and audit by DOE or its designees in accordance with the provisions of Clause I.80, Access to and Ownership of Records, at all reasonable times, before and during the period of retention provided for in paragraph (d) of this clause, and the contractor shall afford DOE proper facilities for such inspection and audit.

(c) Audit of subcontractors' records. The contractor also agrees, with respect to any subcontracts (including fixed-price or unit-price subcontracts or purchase orders)

where, under the terms of the subcontract, costs incurred are a factor in determining the amount payable to the subcontractor of any tier, to either conduct an audit of the subcontractor's costs or arrange for such an audit to be performed by the cognizant government audit agency through the contracting officer.

(d) Disposition of records. Except as agreed upon by the Government and the contractor, all financial and cost reports, books of account and supporting documents, system files, data bases, and other data evidencing costs allowable, collections accruing to the contractor in connection with the work under this contract, other applicable credits, and fee accruals under this contract, shall be the property of the Government, and shall be delivered to the Government or otherwise disposed of by the contractor either as the contracting officer may from time to time direct during the progress of the work or, in any event, as the contracting officer shall direct upon completion or termination of this contract and final audit of accounts hereunder. Except as otherwise provided in this contract, including provisions of Clause I.80, Access to and Ownership of Records, all other records in the possession of the contractor relating to this contract shall be preserved by the contractor for a period of three years after final payment under this contract or otherwise disposed of in such manner as may be agreed upon by the Government and the contractor.

(e) Reports. The contractor shall furnish such progress reports and schedules, financial and cost reports, and other reports concerning the work under this contract as the contracting officer may from time to time require.

(f) Inspections. The DOE shall have the right to inspect the work and activities of the contractor under this contract at such time and in such manner as it shall deem appropriate.

(g) Subcontracts. The contractor further agrees to require the inclusion of provisions similar to those in paragraphs (a) through (g) and paragraph (h) of this clause in all subcontracts (including fixed-price or unit-price subcontracts or purchase orders) of any tier entered into hereunder where, under the terms of the subcontract, costs incurred are a factor in determining the amount payable to the subcontractor.

(h) Comptroller General.

(1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the contractor's directly pertinent records involving transactions related to this contract or a subcontract hereunder.

(2) This paragraph may not be construed to require the contractor or subcontractor to create or maintain any record that the contractor or

subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(3) Nothing in this contract shall be deemed to preclude an audit by the General Accounting Office of any transaction under this contract.

(i) Internal audit. The contractor agrees to conduct an internal audit and examination satisfactory to DOE of the records, operations, expenses, and the transactions with respect to costs claimed to be allowable under this contract annually and at such other times as may be mutually agreed upon. The results of such audit, including the working papers, shall be submitted or made available to the contracting officer. The contractor shall include this paragraph (i) in all cost-reimbursement subcontracts with an estimated cost exceeding $5 million and expected to run for more than two years, and any other cost-reimbursement subcontract determined by the Head of the Contracting Activity.

CLAUSE I.104 - DEAR 970.5232-4 OBLIGATION OF FUNDS (DEC 2000)

(a) Obligation of funds. The amount presently obligated by the Government with respect to this contract is $2,213,024,776.33. Such amount may be increased unilaterally by DOE by written notice to the contractor and may be increased or decreased by written agreement of the parties (whether or not by formal modification of this contract). Estimated collections from others for work and services to be performed under this contract are not included in the amount presently obligated. Such collections, to the extent actually received by the contractor, shall be processed and accounted for in accordance with applicable requirements imposed by the contracting officer pursuant to the Laws, regulations, and DOE directives clause of this contract. Nothing in this paragraph is to be construed as authorizing the contractor to exceed limitations stated in financial plans established by DOE and furnished to the contractor from time to time under this contract.

(b) Limitation on payment by the Government. Except as otherwise provided in this contract and except for costs which may be incurred by the contractor pursuant to the Termination clause of this contract or costs of claims allowable under the contract occurring after completion or termination and not released by the contractor at the time of financial settlement of the contract in accordance with the clause entitled "Payments and Advances," payment by the Government under this contract on account of allowable costs shall not, in the aggregate, exceed the amount obligated with respect to this contract, less the contractor's fee and any negotiated fixed amount. Unless expressly negated in this contract, payment on account of those costs excepted in the preceding sentence which are in excess of the amount obligated with respect to this contract shall be subject to the availability of:

(1) Collections accruing to the contractor in connection with the work under this contract and processed and accounted for in accordance with applicable requirements imposed by the contracting officer pursuant to the Laws, regulations, and DOE directives clause of this contract, and

(2) Other funds which DOE may legally use for such purpose, provided DOE will use its best efforts to obtain the appropriation of funds for this purpose if not otherwise available.

(c) Notices--Contractor excused from further performance. The contractor shall notify DOE in writing whenever the unexpended balance of available funds (including collections available under paragraph (a) of this clause), plus the contractor's best estimate of collections to be received and available during the 45 day period hereinafter specified, is in the contractor's best judgment sufficient to continue contract operations at the programmed rate for only 45 days and to cover the contractor's unpaid fee and any negotiated fixed amounts, and outstanding encumbrances and liabilities on account of costs allowable under the contract at the end of such period. Whenever the unexpended balance of available funds (including collections available under paragraph (a) of this clause), less the amount of the contractor's fee then earned but not paid and any negotiated fixed amounts, is in the contractor's best judgment sufficient only to liquidate outstanding encumbrances and liabilities on account of costs allowable under this contract, the contractor shall immediately notify DOE and shall make no further encumbrances or expenditures (except to liquidate existing encumbrances and liabilities), and, unless the parties otherwise agree, the contractor shall be excused from further performance (except such performance as may become necessary in connection with termination by the Government) and the performance of all work hereunder will be deemed to have been terminated for the convenience of the Government in accordance with the provisions of the Termination clause of this contract.

(d) Financial plans; cost and encumbrance limitations. In addition to the limitations provided for elsewhere in this contract, DOE may, through financial plans, such as Approved Funding Programs, or other directives issued to the contractor, establish controls on the costs to be incurred and encumbrances to be made in the performance of the contract work. Such plans and directives may be amended or supplemented from time to time by DOE. The contractor agrees

(1) to comply with the specific limitations (ceilings) on costs and encumbrances set forth in such plans and directives,

(2) to comply with other requirements of such plans and directives, and

(3) to notify DOE promptly, in writing, whenever it has reason to believe that any limitation on costs and encumbrances will be exceeded or substantially underrun.

(e) Government's right to terminate not affected. The giving of any notice under this clause shall not be construed to waive or impair any right of the Government to terminate the contract under the provisions of the Termination clause of this contract.

CLAUSE I.105 - DEAR 970.5232-5 LIABILITY WITH RESPECT TO COST ACCOUNTING STANDARDS (DEC 2000)

(a) The contractor is not liable to the Government for increased costs or interest resulting from its failure to comply with the clauses of this contract entitled, "Cost Accounting Standards," and "Administration of Cost Accounting Standards," if its failure to comply with the clauses is caused by the contractor's compliance with published DOE financial management policies and procedures or other requirements established by the Department's Chief Financial Officer or Procurement Executive.

(b) The contractor is not liable to the Government for increased costs or interest resulting from its subcontractors' failure to comply with the clauses at FAR 52.230-2, "Cost Accounting Standards," and FAR 52.230-6, "Administration of Cost Accounting Standards," if the contractor includes in each covered subcontract a clause making the subcontractor liable to the Government for increased costs or interest resulting from the subcontractor's failure to comply with the clauses; and the contractor seeks the subcontract price adjustment and cooperates with the Government in the Government's attempts to recover from the subcontractor.

CLAUSE I.106 - DEAR 970.5232-6 WORK FOR OTHERS FUNDING AUTHORIZATION (DEC 2000)

Any uncollectible receivables resulting from the contractor utilizing contractor corporate funding for reimbursable work shall be the responsibility of the contractor, and the United States Government shall have no liability to the contractor for the contractor's uncollected receivables. The contractor is permitted to provide advance payment utilizing contractor corporate funds for reimbursable work to be performed by the contractor for a non-Federal entity in instances where advance payment from that entity is required under the Laws, regulations, and DOE directives clause of this contract and such advance cannot be obtained. The contractor is also permitted to provide advance payment utilizing contractor corporate funds to continue reimbursable work to be performed by the contractor for a Federal entity when the term or the funds on a Federal

interagency agreement required under the Laws, regulations, and DOE directives clause of this contract have elapsed. The contractor's utilization of contractor corporate funds does not relieve the contractor of its responsibility to comply with all requirements for Work for Others applicable to this contract.

CLAUSE I.107- DEAR 970.5232-7 FINANCIAL MANAGEMENT SYSTEM (DEC 2000)

The contractor shall maintain and administer a financial management system that is suitable to provide proper accounting in accordance with DOE requirements for assets, liabilities, collections accruing to the contractor in connection with the work under this contract, expenditures, costs, and encumbrances; permits the preparation of accounts and accurate, reliable financial and statistical reports; and assures that accountability for the assets can be maintained. The contractor shall submit to DOE for written approval an annual plan for new financial management systems and/or subsystems and major enhancements and/or upgrades to the currently existing financial systems and/or subsystems. The contractor shall notify DOE thirty (30) days in advance of any planned implementation of any substantial deviation from this plan and, as requested by the contracting officer, shall submit any such deviation to DOE for written approval before implementation.

CLAUSE I.108 - DEAR 970.5232-8 INTEGRATED ACCOUNTING (DEC 2000)

Integrated accounting procedures are required for use under this contract. The contractor's financial management system shall include an integrated accounting system that is linked to DOE's accounts through the use of reciprocal accounts and that has electronic capability to transmit monthly and year-end self-balancing trial balances to the Department's Primary Accounting System for reporting financial activity under this contract in accordance with requirements imposed by the contracting officer pursuant to the Laws, regulations, and DOE directives clause of this contract.

CLAUSE I.109 - DEAR 970.5235-1 FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER SPONSORING AGREEMENT (DEC 2000)

(a) Pursuant to 48 CFR 35.017-1, this contract constitutes the sponsoring agreement between the Department of Energy and the contractor, which establishes the relationship for the operation of a Department of Energy sponsored Federally Funded Research and Development Center (FFRDC).

(b) In the operation of this FFRDC, the contractor may be provided access beyond that which is common to the normal contractual relationship, to Government and supplier data, including sensitive and proprietary data, and to Government employees and facilities needed to discharge its responsibilities efficiently and

effectively. Because of this special relationship, it is essential that the FFRDC be operated in the public interest with objectivity and independence, be free from organizational conflicts of interest, and have full disclosure of its affairs to the Department of Energy.

(c) Unless otherwise provided by the contract, the contractor may accept work from a nonsponsor (as defined in 48 CFR 35.017) in accordance with the requirements and limitations of DOE Order 481.1, Work for Others (Non-Department of Energy Funded Work) (see current version).

(d) As an FFRDC, the contractor shall not use its privileged information or access to government facilities to compete with the private sector. Specific guidance on restricted activities is contained in DOE Order 481.1.

CLAUSE I.110 - DEAR 970.5236-1 GOVERNMENT FACILITY SUBCONTRACT APPROVAL (DEC 2000) (DEVIATION)

Upon request of the contracting officer and acceptance thereof by the contractor, the contractor shall procure, by subcontract, the construction of new facilities or the alteration or repair of Government-owned facilities at the plant. Any subcontract entered into under this paragraph shall be subject to the written approval of the contracting officer, in accordance with the provisions of Appendix G, and shall contain the provisions relative to labor and wages required by law to be included in contracts for the construction, alteration, and/or repair, including painting and decorating, of a public building or public work.

CLAUSE I.111 - DEAR 970.5204-60 FACILITIES MANAGEMENT (NOV 1997) (DEVIATION)

(a) Life Cycle Asset Management.

(1) In the performance of this contract, the Contractor shall establish, maintain, and use a life cycle asset management system that meets the requirements specified in the contract, and as further defined by the Contracting Officer. The Contractor shall provide the Contracting Officer with a detailed written description of the proposed system for approval within 180 days after contract award.

(2) The Contracting Officer or authorized representative shall evaluate the Contractor's system. Cost effective application of controls will be a critical factor in determining acceptability of the proposed system. The Contractor shall provide access to all pertinent records, data, and plans related to the operations of the life cycle asset management system for purposes of

gaining Contracting Officer approval of the system, approval of proposed changes, and operation of the system.

(3) Upon approval of the life cycle asset management system by the Contracting Officer, the Contractor shall fully implement the system. The Contractor shall not make any significant changes to the approved system without the prior written approval of the Contracting Officer.

(4) The Contractor shall set forth applicable life cycle asset management system requirements in appropriate subcontracts identified in the life cycle asset management system. The Contractor shall incorporate in the identified subcontracts provisions for review and surveillance of the subcontractors' systems. The review will be conducted by the prime Contractor, unless the Government, Contractor, or subcontractor requests Government review.

(5) In furtherance of the Contractor's responsibilities under Clause C.1 (c) to operate and manage the Laboratory, the life-cycle asset management system to be developed by the Contractor shall address the following requirements:

(i) The process for physical asset acquisition shall be an integrated, systematic approach that shall ensure, but shall not be limited to, the following:

(A) Use of a comprehensive land-use process with stakeholder involvement.

(B) Use of a process tool, such as value engineering, to improve efficiency and cost-effectiveness when analyzing physical asset acquisition.

(C) Specification of the appropriate state, regional, or national building codes to which physical assets shall be designed and constructed.

(D) Consideration of maintainability, operability, life-cycle costs, and configuration integrity in designs and acquisitions.

(E) Consideration of current mission needs and an appropriate scope.

(F) Use of a DOE-certified real estate specialist for the execution of real estate acquisitions.

(G) A project management system based on effective management practices that is sufficiently flexible to allow for the size and complexity of the project. For line item projects, the following requirements are considered minimal:

(1) Prior to the commencement of conceptual design, include the following in project planning for approval:

- mission need,
- minimum technical functional requirements,
- proposed cost and schedule ranges,
- preliminary environmental strategy,
- identification of project technical and organizational interfaces, and
- integration with other projects and activities.

(2) Prior to the commencement of execution, include the following in project planning for approval:

- project objectives,
- scope, schedule, and cost baselines,including contingencies;
- life-cycle cost analysis,
- preliminary safety assessment,
- project controls, including baseline change control, change control thresholds, and statusing to

  - Define the work elements for the project in an integrated manner that arranges work in a hierarchy of related elements to a level of detail in which work is assigned;
  - Identify the project organizational structure responsible for accomplishing the work, and define the organizational elements in which work will be planned and controlled;
  - Schedule the authorized work in a manner which describes the sequence of activities and identifies significant task interdependencies required to meet the requirements of the project;
  - Identify physical products/modules, milestones, technical performance goals,

or other indicators that will be used to measure progress;
- Establish and maintain a time-phased cost plan against which project cost performance can be measured;
- Identify, at least monthly, the significant differences between both planned and actual schedule, cost, scope performance, and provide the reasons for the variances in the detail needed by scope and management. Summarize performance data through the project organization and/or work breakdown structure to support management needs and reporting specified in this contract;
- Develop revised estimates of cost at completion based on performance to date, commitment values for material, and estimates of future conditions;
- Incorporate authorized changes in a timely manner, recording the effects of such changes in budget and schedules;
- Control retroactive changes to records pertaining to work performed that would change previously reported amounts for actual costs, work progress, or budgets.

- completion of National Environmental Protection Act,
- verification of performance criteria through test and evaluation, and
- design alternatives.

(3) Prior to operation, a plan for turnover of a facility shall be prepared; verification of performance criteria through test and evaluation shall be accomplished; and operational readiness shall be verified.

(ii) The process for the operation and maintenance of physical assets shall ensure, as a minimum, the following:

(A) The identification, inventory, and periodic assessment of the condition of physical assets in the maintenance program.

(B) The establishment of requirements, budget, and a work management system to maintain physical assets in a condition suitable for their intended use.

(C) The preventive, predictive, and corrective maintenance to ensure physical asset availability for planned use and/or proper disposition.

(D) A configuration management process to ensure the integrity of physical assets and system.

(E) The efficient and effective management and use of energy and utilities.

(F) A method for the prioritization of infrastructure requirements.

(G) The management of backlogs associated with maintenance, repair, and capital improvements.

(iii) The process for the disposition of physical assets shall ensure, as a minimum, the following:

(A) The use of a signed agreement to document items and conditions when transferring assets between DOE program offices.

(B) The use of a DOE-certified real estate specialist to execute the disposal of real estate, including the disposal of DOE improvements without the underlying land.

(C) A method of timely identification and reporting of surplus assets.

(D) In addition, for nuclear facilities, as a minimum the following apply:

(1) The development of a decommissioning turnover plan.

(2) The development of a decontamination plan if appropriate for the facility.

(3) The completion of a deactivation readiness review.

(iv) Utility services shall be acquired and disposed of through DOE unless otherwise authorized by the Contracting Officer.

(v) The physical assets database for the Laboratory shall be maintained as a complete, current inventory of the DOE physical assets utilizing the Facilities Information Management System (FIMS).

(vi) In the acquisition, operation, maintenance, and disposition of physical assets, the Contractor shall ensure that all applicable Federal, state, and local laws and regulations are followed.

(b) General Design Criteria for Nuclear Facilities. The general design criteria, DOE 6430.1A, General Design Criteria, shall be utilized by the Contractor in performing engineering design for nuclear facilities for which it is responsible under this contract. The Contractor shall comply with the applicable requirements for all nuclear facility designs with regard to any new facility, facility addition or alteration or facility lease. This includes on-site constructed buildings, pre-engineered buildings, and plan-fabricated modular buildings. For existing facilities, original design criteria apply to the structure in general; however, additions or modifications shall comply with this directive and the associated latest editions of the references therein.

(c) Nuclear Facilities Maintenance Management. For nuclear facilities the Contractor shall comply with the provisions of DOE Directive 4330.4B, Maintenance Management Program. The Contractor shall maintain property for which it is accountable in a manner which promotes operational safety, environmental protection and compliance, property preservation, and cost effectiveness. The Contractor shall maintain property to assure the property's ability, throughout its life, to meet the requirements for which it was designed or its current use. This will include periodic examination of the property to determine any deterioration or technical obsolescence which may threaten performance or safety.

(d) Energy management. The Contractor shall manage the facilities for which it is responsible under the terms and conditions of this contract in an energy efficient manner in accordance with DOE Directive 4330.2D, In-House Energy Management.

(e) Subcontract requirements. To the extent the Contractor subcontracts performance of any of the responsibilities discussed in this clause, the subcontract shall contain the requirements of this clause relative to the subcontracted responsibilities.

CLAUSE I.112 - DEAR 970.5242-1 PENALTIES FOR UNALLOWABLE COSTS (DEC 2000)

(a) Contractors which include unallowable cost in a submission for settlement for cost incurred, may be subject to penalties.

(b) If, during the review of a submission for settlement of cost incurred, the contracting officer determines that the submission contains an expressly unallowable cost or a cost determined to be unallowable prior to the submission, the contracting officer shall assess a penalty.

(c) Unallowable costs are either expressly unallowable or determined unallowable.

(1) An expressly unallowable cost is a particular item or type of cost which, under the express provisions of an applicable law, regulation, or this contract, is specifically named and stated to be unallowable.

(2) A cost determined unallowable is one which, for that contractor,

(i) was subject to a contracting officer's final decision and not appealed;

(ii) the Department's Board of Contract Appeals or a court has previously ruled as unallowable; or

(iii) was mutually agreed to be unallowable.

(d) If the contracting officer determines that a cost submitted by the contractor in its submission for settlement of cost incurred is:

(1) expressly unallowable, then the contracting officer shall assess a penalty in an amount equal to the disallowed cost allocated to this contract plus interest on the paid portion of the disallowed cost. Interest shall be computed from the date of overpayment to the date of repayment using the interest rate specified by the Secretary of the Treasury pursuant to Pub. L. 92-41 (85 Stat. 97); or

(2) determined unallowable, then the contracting officer shall assess a penalty in an amount equal to two times the amount of the disallowed cost allocated to this contract.

(e) The contracting officer may waive the penalty provisions when

(1) the contractor withdraws the submission before the formal initiation of an audit of the submission and submits a revised submission;

(2) the amount of the unallowable costs allocated to covered contracts is $10,000 or less; or

(3) the contractor demonstrates to the contracting officer's satisfaction that:

(i) it has established appropriate policies, personnel training, and an internal control and review system that provides assurances that unallowable costs subject to penalties are precluded from the contractor's submission for settlement of costs; and

(ii) the unallowable costs subject to the penalty were inadvertently incorporated into the submission.

CLAUSE I.113 - DEAR 970.5243-1 CHANGES (DEC 2000)

(a) Changes and adjustment of fee. The contracting officer may at any time and without notice to the sureties, if any, issue written directions within the general scope of this contract requiring additional work or directing the omission of, or variation in, work covered by this contract. If any such direction results in a material change in the amount or character of the work described in the "Statement of Work," an equitable adjustment of the fee, if any, shall be made in accordance with the agreement of the parties and the contract shall be modified in writing accordingly. Any claim by the contractor for an adjustment under this clause must be asserted in writing within 30 days from the date of receipt by the contractor of the notification of change; provided, however, that the contracting officer, if it is determined that the facts justify such action, may receive and act upon any such claim asserted at any time prior to final payment under this contract. A failure to agree on an equitable adjustment under this clause shall be deemed to be a dispute within the meaning of the clause entitled "Disputes."

(b) Work to continue. Nothing contained in this clause shall excuse the contractor from proceeding with the prosecution of the work in accordance with the requirements of any direction hereunder.

CLAUSE I.114 - DEAR 970.5244-1 CONTRACTOR PURCHASING SYSTEM (DEC 2000) (includes modifications in final rule dated 1/18/01) (DEVIATION)

(a) General. The contractor shall develop, implement, and maintain formal policies, practices, and procedures to be used in the award of subcontracts consistent with this clause and 48 CFR 970.44. The contractor's purchasing system and methods shall be fully documented, consistently applied, and acceptable to DOE in accordance with 48 CFR 970.4401-1. The contractor shall maintain file documentation which is appropriate to the value of the purchase and is adequate to establish the propriety of the transaction and the price paid. The contractor's purchasing performance will be evaluated against such performance criteria and measures as may be set forth elsewhere in this contract. DOE reserves the right at any time to require that the contractor submit for approval any or all purchases under this contract. The contractor shall not purchase any item or service the

purchase of which is expressly prohibited by the written direction of DOE and shall use such special and directed sources as may be expressly required by the DOE contracting officer. DOE will conduct periodic appraisals of the contractor's management of all facets of the purchasing function, including the contractor's compliance with its approved system and methods. Such appraisals will be performed through the conduct of Contractor Purchasing System Reviews in accordance with 48 CFR subpart 44.3, or, when approved by the contracting officer, through the contractor's participation in the conduct of the Balanced Scorecard performance measurement and performance management system. The contractor's approved purchasing system and methods shall include the requirements set forth in paragraphs (b) through (y) of this clause.

(b) Acquisition of utility services. Utility services shall be acquired in accordance with the requirements of 48 CFR 970.41.

(c) Acquisition of Real Property. Real property shall be acquired in accordance with 48 CFR Subpart 917.74.

(d) Advance Notice of Proposed Subcontract Awards. Advance notice shall be provided in accordance with 48 CFR 970.4401-3.

(e) Audit of Subcontractors.

(1) The contractor shall provide for:

(i) periodic post-award audit of cost-reimbursement subcontractors at all tiers, and

(ii) audits, where necessary, to provide a valid basis for pre-award or cost or price analysis.

(2) Responsibility for determining the costs allowable under each cost-reimbursement subcontract remains with the contractor or next higher-tier subcontractor. The contractor shall provide, in appropriate cases, for the timely involvement of the contractor and the DOE contracting officer in resolution of subcontract cost allowability.

(3) Where audits of subcontractors at any tier are required, arrangements may be made to have the cognizant Federal agency perform the audit of the subcontract. These arrangements shall be made administratively between DOE and the other agency involved and shall provide for the cognizant agency to audit in an appropriate manner in light of the magnitude and nature of the subcontract. In no case, however, shall these arrangements preclude determination by the DOE contracting officer of the allowability or

unallowability of subcontractor costs claimed for reimbursement by the contractor.

(4) Allowable costs for cost reimbursable subcontracts are to be determined in accordance with the cost principles of 48 CFR Part 31, appropriate for the type of organization to which the subcontract is to be awarded, as supplemented by 48 CFR Part 931. Allowable costs in the purchase or transfer from contractor-affiliated sources shall be determined in accordance with 48 CFR 970.4402-3 and 48 CFR 970.3102-3-21(b).

(f) Bonds and Insurance.

(1) The contractor shall require performance bonds in penal amounts as set forth in 48 CFR 28.102-2(a) for all fixed priced and unit-priced construction subcontracts in excess of $100,000. The contractor shall consider the use of performance bonds in fixed price nonconstruction subcontracts, where appropriate.

(2) For fixed-price, unit-priced and cost reimbursement construction subcontracts in excess of $100,000 a payment bond shall be obtained on Standard Form 25A modified to name the contractor as well as the United States of America as obligees. The penal amounts shall be determined in accordance with 48 CFR 28.102-2(b).

(3) For fixed-price, unit-priced and cost-reimbursement construction subcontracts, greater than $25,000, but not greater than $100,000, the contractor shall select two or more of the payment protections at 48 CFR 28.102-1(b), giving particular consideration to the inclusion of an irrevocable letter of credit as one of the selected alternatives.

(4) A subcontractor may have more than one acceptable surety in both construction and other subcontracts, provided that in no case will the liability of any one surety exceed the maximum penal sum for which it is qualified for any one obligation. For subcontracts other than construction, a co-surety (two or more sureties together) may reinsure amounts in excess of their individual capacity, with each surety having the required underwriting capacity that appears on the list of acceptable corporate sureties.

(g) Buy American. The contractor shall comply with the provisions of the Buy American Act as reflected in 48 CFR 52.225-1 (May 2002), as amended by AL 2002-06 and 48 CFR 52.225-9 (May 2002), as amended by AL 2002-06. The contractor shall forward determinations of nonavailability of individual items to the DOE contracting officer for approval. Items in excess of $100,000 require the prior concurrence of the Head of Contracting Activity. If, however, the contractor

has an approved purchasing system, the Head of the Contracting Activity may authorize the contractor to make determinations of nonavailability for individual items valued at $100,000 or less.

(h) Construction and Architect-Engineer Subcontracts.

(1) Independent Estimates. A detailed, independent estimate of costs shall be prepared for all construction work to be subcontracted.

(2) Specifications. Specifications for construction shall be prepared in accordance with the DOE publication entitled "General Design Criteria Manual."

(3) Prevention of Conflict of Interest.

(i) The contractor shall not award a subcontract for construction to the architect-engineer firm or an affiliate that prepared the design. This prohibition does not preclude the award of a "turnkey" subcontract so long as the subcontractor assumes all liability for defects in design and construction and consequential damages.

(ii) The contractor shall not award both a cost-reimbursement subcontract and a fixed-price subcontract for construction or architect-engineer services or any combination thereof to the same firm where those subcontracts will be performed at the same site.

(iii) The contractor shall not employ the construction subcontractor or an affiliate to inspect the firm's work. The contractor shall assure that the working relationships of the construction subcontractor and the subcontractor inspecting its work and the authority of the inspector are clearly defined.

(i) Contractor-Affiliated Sources. Equipment, materials, supplies, or services from a contractor-affiliated source shall be purchased or transferred in accordance with 48 CFR 970.4402-3.

(j) Contractor-Subcontractor Relationship. The obligations of the contractor under paragraph (a) of this clause, including the development of the purchasing system and methods, and purchases made pursuant thereto, shall not relieve the contractor of any obligation under this contract (including, among other things, the obligation to properly supervise, administer, and coordinate the work of subcontractors). Subcontracts shall be in the name of the contractor, and shall not bind or purport to bind the Government.

(k) Government Property. Identification, inspection, maintenance, protection, and disposition of Government property shall conform with the policies and principles of 48 CFR Part 45, 48 CFR 945, the Federal Property Management Regulations 41 CFR Chapter 101, the DOE Property Management Regulations 41 CFR Chapter 109, and their contracts.

(l) Indemnification. Except for Price-Anderson Nuclear Hazards Indemnity, no subcontractor may be indemnified except with the prior approval of the Senior Procurement Executive.

(m) Leasing of Motor Vehicles. Contractors shall comply with 48 CFR 8.11 and 48 CFR 908.11.

(n) Make-or-Buy Plans. Acquisition of property and services shall be obtained on a least-cost basis, consistent with the requirements of the "Make-or-Buy Plan" clause of this contract and the contractor's approved make-or-buy plan.

(o) Management, Acquisition and Use of Information Resources. Requirements for automatic data processing resources and telecommunications facilities, services, and equipment, shall be reviewed and approved in accordance with applicable DOE Orders and regulations regarding information resources.

(p) Priorities, Allocations and Allotments. Priorities, allocations and allotments shall be extended to appropriate subcontracts in accordance with the clause or clauses of this contract dealing with priorities and allocations.

(q) Purchase of Special Items. Purchase of the following items shall be in accordance with the following provisions of 48 CFR 908.71 and the Federal Property Management Regulations, 41 CFR Chapter 101:

(1) Motor vehicles--48 CFR 908.7101
(2) Aircraft--48 CFR 908.7102
(3) Security Cabinets--48 CFR 908.7106
(4) Alcohol--48 CFR 908.7107
(5) Helium--48 CFR 908.7108
(6) Fuels and packaged petroleum products--48 CFR 908.7109
(7) Coal--48 CFR 908.7110
(8) Arms and Ammunition--48 CFR 908.7111
(9) Heavy Water--48 CFR 908.7121(a)
(10) Precious Metals--48 CFR 908.7121(b)
(11) Lithium--48 CFR 908.7121(c)
(12) Products and services of the blind and severely handicapped--41 CFR 101-26.701
(13) Products made in Federal penal and correctional institutions--41 CFR 101-26.702

(r) Purchase vs. Lease Determinations. Contractors shall determine whether required equipment and property should be purchased or leased, and establish appropriate thresholds for application of lease vs. purchase determinations. Such determinations shall be made:

(1) at time of original acquisition;

(2) when lease renewals are being considered; and

(3) at other times as circumstances warrant.

(s) Quality Assurance. Contractors shall provide no less protection for the Government in its subcontracts than is provided in the prime contract.

(t) Setoff of Assigned Subcontractor Proceeds. Where a subcontractor has been permitted to assign payments to a financial institution, the assignment shall treat any right of setoff in accordance with 48 CFR 932.803.

(u) Strategic and Critical Materials. The contractor may use strategic and critical materials in the National Defense Stockpile.

(v) Termination. When subcontracts are terminated as a result of the termination of all or a portion of this contract, the contractor shall settle with subcontractors in conformity with the policies and principles relating to settlement of prime contracts in 48 CFR Subparts 49.1, 49.2 and 49.3. When subcontracts are terminated for reasons other than termination of this contract, the contractor shall settle such subcontracts in general conformity with the policies and principles in 48 CFR Subparts 49.1, 49.2, 49.3 and 49.4. Each such termination shall be documented and consistent with the terms of this contract. Terminations which require approval by the Government shall be supported by accounting data and other information as may be directed by the contracting officer.

(w) Unclassified Controlled Nuclear Information. Subcontracts involving unclassified uncontrolled nuclear information shall be treated in accordance with 10 CFR part 1017.

(x) Subcontract Flowdown Requirements. In addition to terms and conditions that are included in the prime contract which direct application of such terms and conditions in appropriate subcontracts, the contractor shall include the following clauses in subcontracts, as applicable:

(1) Davis-Bacon clauses prescribed in 48 CFR 22.407.

(2) Foreign Travel clause prescribed in 48 CFR 952.247-70.

(3) Counterintelligence clause prescribed in 48 CFR 970.0404-4(a).

(4) Service Contract Act clauses prescribed in 48 CFR 22.1006.

(5) State and local taxes clause prescribed in 48 CFR 970.2904-1.

(6) Cost or pricing data clauses prescribed in 48 CFR 970.1504-3-1(b).

(y) Legal Services. Contractor purchases of litigation and other legal services are subject to the requirements in 10 CFR part 719 and the requirements of this clause.

CLAUSE I.115 - DEAR 970.5245-1 PROPERTY (DEC 2000) (ALTERNATE I) (DEC 2000)

(a) Furnishing of Government property. The Government reserves the right to furnish any property or services required for the performance of the work under this contract.

(b) Title to property. Except as otherwise provided by the contracting officer, title to all materials, equipment, supplies, and tangible personal property of every kind and description purchased by the contractor, for the cost of which the contractor is entitled to be reimbursed as a direct item of cost under this contract, shall pass directly from the vendor to the Government. The Government reserves the right to inspect, and to accept or reject, any item of such property. The contractor shall make such disposition of rejected items as the contracting officer shall direct. Title to other property, the cost of which is reimbursable to the contractor under this contract, shall pass to and vest in the Government upon (1) issuance for use of such property in the performance of this contract, or (2) commencement of processing or use of such property in the performance of this contract, or (3) reimbursement of the cost thereof by the Government, whichever first occurs. Property furnished by the Government and property purchased or furnished by the contractor, title to which vests in the Government, under this paragraph are hereinafter referred to as Government property. Title to Government property shall not be affected by the incorporation of the property into or the attachment of it to any property not owned by the Government, nor shall such Government property or any part thereof, be or become a fixture or lose its identity as personality by reason of affixation to any realty.

(c) Identification. To the extent directed by the contracting officer, the contractor shall identify Government property coming into the contractor's possession or custody, by marking and segregating in such a way, satisfactory to the contracting officer, as shall indicate its ownership by the Government.

(d) Disposition. The contractor shall make such disposition of Government property which has come into the possession or custody of the contractor under this contract as the contracting officer may direct during the progress of the work or upon completion or termination of this contract. The contractor may, upon such terms and conditions as the contracting officer may approve, sell, or exchange such property, or acquire such property at a price agreed upon by the contracting officer and the contractor as the fair value thereof. The amount received by the contractor as the result of any disposition, or the agreed fair value of any such property acquired by the contractor, shall be applied in reduction of costs allowable under this contract or shall be otherwise credited to account to the Government, as the contracting officer may direct. Upon completion of the work or the termination of this contract, the contractor shall render an accounting, as prescribed by the contracting officer, of all government property which had come into the possession or custody of the contractor under this contract.

(e) Protection of government property--management of high-risk property and classified materials.

(1) The contractor shall take all reasonable precautions, and such other actions as may be directed by the contracting officer, or in the absence of such direction, in accordance with sound business practice, to safeguard and protect government property in the contractor's possession or custody.

(2) In addition, the contractor shall ensure that adequate safeguards are in place, and adhered to, for the handling, control and disposition of high-risk property and classified materials throughout the life cycle of the property and materials consistent with the policies, practices and procedures for property management contained in the Federal Property Management regulations (41 CFR chapter 101), the Department of Energy Property Management regulations (41 CFR chapter 109), and other applicable regulations.

(3) High-risk property is property, the loss, destruction, damage to, or the unintended or premature transfer of which could pose risks to the public, the environment, or the national security interests of the United States. High-risk property includes proliferation sensitive, nuclear related dual use, export controlled, chemically or radioactively contaminated, hazardous, and specially designed and prepared property, including property on the militarily critical technologies list.

(f) Risk of loss of Government property.

(1) (i) The contractor shall not be liable for the loss or destruction of, or damage to, Government property unless such loss, destruction, or damage was caused by any of the following:

(A) Willful misconduct or lack of good faith on the part of the contractor's managerial personnel;

(B) Failure of the contractor's managerial personnel to take all reasonable steps to comply with any appropriate written direction of the contracting officer to safeguard such property under paragraph (e) of this clause; or

(C) Failure of contractor managerial personnel to establish, administer, or properly maintain an approved property management system in accordance with paragraph (i)(1) of this clause.

(ii) If, after an initial review of the facts, the contracting officer informs the contractor that there is reason to believe that the loss, destruction of, or damage to the government property results from conduct falling within one of the categories set forth above, the burden of proof shall be upon the contractor to show that the contractor should not be required to compensate the government for the loss, destruction, or damage.

(2) In the event that the contractor is determined liable for the loss, destruction or damage to Government property in accordance with (f)(1) of this clause, the contractor's compensation to the Government shall be determined as follows:

(i) For damaged property, the compensation shall be the cost of repairing such damaged property, plus any costs incurred for temporary replacement of the damaged property. However, the value of repair costs shall not exceed the fair market value of the damaged property. If a fair market value of the property does not exist, the contracting officer shall determine the value of such property, consistent with all relevant facts and circumstances.

(ii) For destroyed or lost property, the compensation shall be the fair market value of such property at the time of such loss or destruction, plus any costs incurred for temporary replacement and costs associated with the disposition of destroyed property. If a fair market value of the property does not exist, the contracting officer shall determine the value of such property, consistent with all relevant facts and circumstances.

(3) The portion of the cost of insurance obtained by the contractor that is allocable to coverage of risks of loss referred to in paragraph (f)(1) of this clause is not allowable.

(g) Steps to be taken in event of loss. In the event of any damage, destruction, or loss to Government property in the possession or custody of the contractor with a value above the threshold set out in the contractor's approved property management system, the contractor:

(1) Shall immediately inform the contracting officer of the occasion and extent thereof,

(2) Shall take all reasonable steps to protect the property remaining, and

(3) Shall repair or replace the damaged, destroyed, or lost property in accordance with the written direction of the contracting officer. The contractor shall take no action prejudicial to the right of the Government to recover therefore, and shall furnish to the Government, on request, all reasonable assistance in obtaining recovery.

(h) Government property for Government use only. Government property shall be used only for the performance of this contract.

(i) Property Management.

(1) Property Management System.

(i) The contractor shall establish, administer, and properly maintain an approved property management system of accounting for and control, utilization, maintenance, repair, protection, preservation, and disposition of Government property in its possession under the contract. The contractor's property management system shall be submitted to the contracting officer for approval and shall be maintained and administered in accordance with sound business practice, applicable Federal Property Management regulations and Department of Energy Property Management regulations, and such directives or instructions which the contracting officer may from time to time prescribe.

(ii) In order for a property management system to be approved, it must provide for:

(A) Comprehensive coverage of property from the requirement identification, through its life cycle, to final disposition;

(B) Employee personal responsibility and accountability for Government-owned property;

(C) Full integration with the contractor's other administrative and financial systems; and

(D) A method for continuously improving property management practices through the identification of best practices established by "best in class" performers.

(iii) Approval of the contractor's property management system shall be contingent upon the completion of the baseline inventory as provided in subparagraph (i)(2) of this clause.

(2) Property Inventory.

(i) Unless otherwise directed by the contracting officer, the contractor shall within six months after execution of the contract provide a baseline inventory covering all items of Government property.

(ii) If the contractor is succeeding another contractor in the performance of this contract, the contractor shall conduct a joint reconciliation of the property inventory with the predecessor contractor. The contractor agrees to participate in a joint reconciliation of the property inventory at the completion of this contract. This information will be used to provide a baseline for the succeeding contract as well as information for closeout of the predecessor contract.

(j) The term "contractor's managerial personnel" as used in this clause means the contractor's directors, officers and any of its managers, superintendents, or other equivalent representatives who have supervision or direction of all or substantially all of:

(1) The contractor's business; or

(2) The contractor's operations at any one facility or separate location at which this contract is being performed; or

(3) The contractor's Government property system and/or a Major System Acquisition or Major Project as defined in DOE Order 4700.1 (Version in effect on effective date of contract).

Notwithstanding the above, the term "Contractor's managerial personnel" means the Contractor's Board of Directors, corporate officers, Laboratory Director, Deputy Laboratory Directors, Associate Laboratory Directors, Assistant Laboratory Directors, RHIC Project Director, and General Counsel.

(k) The contractor shall include this clause in all cost reimbursable subcontracts.

PART III

List of Documents, Exhibits and Other Attachments

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J.2	Appendix B - Performance Measures and Criteria
J.3	Appendix C - Special Financial Institution Account
J.4	Appendix D - Budget Program
J.5	Appendix E - Make or Buy Plan
J.6	Appendix F - Reserved
J.7	Appendix G - Purchasing System Requirements
J.8	Appendix H - FY '03 - Small Business Subcontracting Plan
J.9	Appendix I - DOE Directives/List B
J.10	Appendix J - Treaties and International Agreements/Waived Inventions
J.11	Appendix K – Spallation Neutron Source
J.12	Appendix L – Computation of Fee
J.13	Appendix M - Contract Guidance for Preparation of Diversity Plan
J.14	Appendix N – Chronic Beryllium Disease Prevention Program (CBDPP)

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.1

APPENDIX A

PERSONNEL APPENDIX

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

Brookhaven National Laboratory
Operated by
Brookhaven Science Associates

APPENDIX A

PERSONNEL APPENDIX

Brookhaven National Laboratory
Operated by
Brookhaven Science Associates

APPENDIX A

The provisions of this Appendix A are applicable to work under Contract DE-AC02-98CH10886 and costs incurred in accordance herewith shall be allowable costs.

APPENDIX A

PERSONNEL EXPENSES

UNDER CLAUSE I.80A – ALLOWABLE COSTS AND FEES

BROOKHAVEN NATIONAL LABORATORY

Contract No. DE-AC02-98CH10886

Appendix A - Personnel and Related Allowable Costs

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BROOKHAVEN NATIONAL LABORATORY

Contract No. DE-AC02-98CH10886

I. INTRODUCTION

This Personnel Appendix sets forth those Contractor human resource management practices, policies, procedures and employee-related costs (i.e., salaries, fringe benefits, travel, relocation, etc.) deemed reasonable and allowable for reimbursement when incurred in the performance of the Contract work.

The Contractor shall select, hire, manage, and direct the work force. The Contractor shall use effective management review procedures and internal controls to assure that all costs are allowable and that actions which require prior approval of the Department of Energy are reviewed and approved prior to incurrence of cost.

Either party may request that this Personnel Appendix be revised and the parties hereto agree to give consideration in good faith to any such request. By September 30, 1998, the new Contractor is expected to review the current BNL HR programs to ensure that they support the DOE mission, promote work force excellence, champion work force diversity, and achieve effective cost management performance. Any proposed changes to benefits covered under the existing Personnel Appendix would be subject to DOE approval. Any proposed changes to benefits covered under the existing bargaining agreements would be subject to bargaining under the terms of the applicable agreement. It is understood that the Contractor may propose to restructure the Personnel Appendix consistent with current efforts to eliminate requirements for approvals of internal policies and procedures. Revisions to the Personnel Appendix shall be accomplished by executing a Reimbursement Authorization, as approved by the Department of Energy. When revisions to this Personnel Appendix are agreed upon, revised pages will be issued reflecting such changes and will bear the effective date of such changes and the Reimbursement Authorization number in the upper right-hand corner of each page.

The Personnel Appendix is adopted for the exclusive benefit and convenience of the parties hereto, and nothing contained herein shall be construed as conferring any right or benefit upon past, present, or future employees of the Contractor, or upon any other third party, except as otherwise provided for in this contract/appendix.

The Contractor shall promptly furnish all reports and information required or otherwise indicated in this Appendix to the Contracting Officer or other parties identified by the Contracting Officer. The Contractor and the Department of Energy recognize that other data requests may be made from time to time and the parties agree to cooperate in meeting such requests.

APPENDIX A

DEFINITIONS

II. DEFINITIONS

For clarity and consistency of meaning and intent, the following terms should be defined for use in the Appendix:

Basic Rate. An individual's established salary or wage rate, exclusive of any premium payments.

Eligible part-time employee. A regular employee who is regularly scheduled to work 20 or more hours but less than 40 hours per week.

Employee. A person employed by the Laboratory to carry out work under Contract DE-AC02-98CH10886.

Exempt employee. An employee exempt from the provisions of the Fair Labor Standards Act.

Full-time employee. An employee who is regularly scheduled to work at least 40 hours per week.

Nonexempt employee. An employee subject to the provisions of the Fair Labor Standards Act.

Overtime pay. Payment, in addition to straight time, for any hours worked in excess of 40 hours within a payroll week for all nonexempt employees and, in addition, for weekly employees for hours in excess of eight hours in any workday.

Part-time employee. An employee who is scheduled to work less than 40 hours per week.

Regular employee. An employee whose employment is intended to extend beyond three months.

Salary Adjustment. Any change in the basic rate of pay other than an increase for merit, reclassification, or promotion.

Service. Except as provided below, employment with the Contractor from date of hire. Unpaid leaves of absence will not be counted. Prior service will not be credited if there has been a break in service over three years, or as otherwise

specified in this Appendix. Those employees transferring to Brookhaven Science Associates (BSA) from the State University of New York at Stony Brook (USB), Research Foundation of State University of New York, Battelle Memorial Institute, or Associated Universities, Inc. or the subsidiaries or affiliates of these organizations shall receive credit for their service in any of those organizations when determining total BSA service. There shall be no transfers of money or liability with respect to any benefit plans when any such transfers occurs.

Straight-time Rate. An individual's basic rate plus any applicable shift differential.

Temporary employee. An employee who is employed for a period not to exceed three months. Notwithstanding the foregoing definitions of a "regular employee" and a "temporary employee," a person appointed to a position with the laboratory as research assistant, research collaborator, technical collaborator, or visiting scientist shall be considered a temporary employee, except to the extent otherwise specified by the terms of his/her appointment.

Termination. Resignation, discharge, layoff, retirement, death or removal from payroll because of a disability.

Workday (for an employee). The period of 24 hours, commencing with the time the employee commences work.

Workweek (for an employee). The period extending from Sunday midnight to the following Sunday midnight.

Where it is stated herein that an action may be taken, the word "may" shall be construed to mean that the taking of such action, in whole or in part, is discretionary with the Laboratory.

APPENDIX A

PAY POLICIES

Brookhaven National Laboratory
Operated by
Brookhaven Science Associates

Appendix A - Salaries and Wages

1. Salary and Wage Administration

a. General Provisions

The objective of the compensation administration program is to (1) provide a level of compensation which, within available funds, attracts, motivates and assures an efficient and technically competent work force; (2) provide an accurate and valid salary comparison to the labor markets in which the organization competes; (3) reflect the worth of each position to the organization; and (4) relate salary and wage rates of the employees under the contract to performance.

In establishing or modifying compensation levels, the Contractor will be guided by the following considerations:

(1) The Contractor is a competitor in the local labor market area for most nonexempt salaried personnel and will adopt and maintain compensation levels and benefit policies and practices relative to other comparable employers in the area where the Contractor operates and competes for labor under this contract.

(2) The Contractor recruits most of its exempt personnel from regional and national labor markets. Accordingly, compensation and benefit levels will be commensurate and relative to comparable positions in the industries, academic communities, and employment markets in which the Contractor operates and competes for labor under this contract. When local survey information indicates variance from regional or national norms, this will also be considered.

(3) The Contractor will use its best efforts to comply with any special compensation policies established by the Secretary of Energy affecting contractors.

(4) The Contractor, during the term of the contract, will conform to the guidelines as set forth in annual approval procedures for Compensation Increase Plans issued by DOE-Headquarters.

Future major modifications to compensation program policies affecting reimbursable costs shall be submitted to the Contracting Officer for approval and shall not be binding for reimbursement purposes until approved by the Contracting Officer. Other modifications shall be submitted to the Contracting Officer for information.

The Contractor shall establish and maintain a method for documenting time and attendance records which will form the basis for all pay and leave computations.

The Laboratory will provide DOE with periodic salary and wage reports as may be required in connection with the Laboratory's salary and wage program.

Until such time as the Contractor's compensation system is approved, the Contractor shall be required to submit all individual salary actions over $100K, with justification as outlined in DOE Order 350.1, to the Contracting Officer for review and approval. DOE will not reimburse the compensation of any individual in excess of $250,000 per year.

In addition to the above referenced justification, the salary actions for the Director and the Deputy Director shall include information in support of mission goals, Department business lines, size of budget, number of employees supervised, education and experience, Brookhaven National Laboratory background data which supports the proposed salary, an evaluation of performance, and internal and external comparative data where available.

Any commitments made and any salary increases granted to employees regarding compensation actions prior to Contracting Officer approval, shall not be allowable unless the Contracting Officer determines otherwise.

b. Salary Increase Fund

Each year, in accordance with the Contractor's policies and procedures, the Contractor will develop and justify a Salary Increase Fund Proposal for Department of Energy approval. This proposal will address the state of the Laboratory's work force relative to labor markets, general economic conditions, competency, productivity, efficiency, retention and diversity.

A major component of the Salary Increase Fund is the measurement of the Laboratory against national and local surveys. The surveys, including DOE-sponsored surveys, area rates, and other criteria as may be pertinent to the establishment of proposed salaries for each occupational group; i.e., scientist and engineer, professional, administrative, technical, and clerical will be listed for the Contracting Officer. The proposal should include data which measures average pay to market pay; information regarding surveys; aging factors used in escalating survey data; projection of escalation in the market and supporting information; and analysis to support special adjustment requests. The object of the fund is to attract and retain a technically competent, productive and efficient work force. Each component of the fund, i.e., merit, promotion, adjustment, reclassification, and, if used, performance incentives, shall be justified separately.

The fund is calculated as a percentage of payroll for each pay structure at the end of the prior salary year (expressed as an annualized amount) and shall be the maximum allowed for granting increases for employees based on merit, special adjustments, reclassification, promotions and, if used, special performance incentives.

All increases are charged to the fund on an annualized basis. Once an individual salary increase is charged to the fund, reuse of that amount, i.e., recovery, for any other purpose during the salary year is not authorized. If an individual terminates before receiving an increase, the portion of the fund allocated for that increase may remain in the fund.

The Contractor shall also provide, a copy of the annually developed salary increase guidelines prepared for supervisory use, indicating the parameters for granting various increases based on employee performance and current salary. Employees whose performance does not merit an increase will not be rewarded regardless of pay range position.

c. Salary and wage schedules and job classifications are attached hereto as the following Schedules:

Schedule I	-	Management Schedule
Schedule I-A	-	Scientific Schedule
Schedule I-B	-	Engineers/Scientific Associates Schedule
Schedule I-C	-	Administrative Schedule
Schedule I-D	-	Technical Support/Supervisory Schedule
Schedule I-E	-	Information Technology Schedule
Schedule II-A	-	Technical Wage Schedule
Schedule II-B	-	Clerical Wage Schedule

All changes to the salary and wage schedules attached hereto shall require Contracting Officer approval. In addition, the Laboratory will periodically provide an updated listing of all job classifications.

2. Job Evaluation

The contractor has developed and maintains a formal job evaluation system which evaluates duties of positions consistent with the external and internal value of jobs and

places them in a grade in the appropriate schedule. All job evaluations shall be reviewed in a systematic manner over a five year period. All job evaluations for newly created positions shall be completed prior to an offer being made to a selected employee.

Job descriptions and the basis for evaluation shall be made available for Contracting Officer review upon request.

3. Grades and Rate Ranges

Salary ranges with a minimum, midpoint, where appropriate, and maximum for each job grade have been established and approved in accordance with the Contractor's policies and procedures. Any changes in the rate ranges will be approved in advance by the Contracting Officer.

4. Basis of Payment

a. A full-time nonexempt employee is paid on:

(i) a weekly basis, the rate representing compensation for five regularly scheduled eight-hour days in each workweek, or;

(ii) a monthly basis, the rate representing compensation for all hours worked in a calendar month except as otherwise provided in this Appendix A.

b. A full-time exempt employee is paid a monthly salary as full compensation for all work performed regardless of the hours actually worked, except as otherwise provided in this Appendix A. However, it is considered that the regular weekly work schedule will be 40 hours.

c. A part-time employee is paid on the basis established by the terms of his/her employment or appointment.

5. Performance Evaluation System

The contractor shall maintain an effective performance evaluation system which appraises each employee on an annual basis against performance criteria appropriate to specific job requirements and job level.

6. Overtime

a. Nonexempt employees

A nonexempt employee may be paid at 1-1/2 times his/her regular base rate for all emergency work, for all work performed in excess of forty hours in any workweek, and in the case of an hourly or weekly employee, for all work performed in excess of eight hours in any workday, except that when a weekly employee is granted, at his/her request, a variation in the time of his scheduled work, the calendar day (midnight to midnight) may be considered a workday. For the purpose of computing premium pay under this section for monthly nonexempt employees, holidays may be counted as time worked. A nonexempt employee may be paid at 1-1/2 times his/her regular base rate for all hours worked on the first of his/her scheduled days off in any workweek and at two times his/her regular base rate for work performed on the second of his/her scheduled days off in any workweek.

A nonexempt employee required to work more than twelve hours within a period of twenty-four consecutive hours may be paid at two times his/her regular base rate for all hours so worked in excess of twelve. A nonexempt employee required to work more than sixteen consecutive hours may be paid at two times his/her regular base rate for all hours so worked in excess of sixteen. A nonexempt employee who has worked a continuous period of sixteen hours or more shall be entitled to an eight-hour rest period before returning to work. If this eight-hour period extends into the employee's regular work schedule, the employee shall be paid at straight time for the hours extending into the employee's regular work schedule.

If a nonexempt employee at the direction of the Laboratory performs emergency work or performs work on either of his/her scheduled days off, and the overtime payment for such work amounts to less than four hours' pay at his/her regular base rate, the employee may be paid four hours' pay at his/her regular base rate, (plus shift premium, if any) for such work. A weekly employee who is required to work beyond his/her scheduled hours may be guaranteed a minimum of one hour's pay at his/her base rate for the overtime work.

The Laboratory operating procedures for regularly scheduled shifts shall be submitted to DOE for information. The Laboratory will also provide the Contracting Officer with an semi-annual report on overtime usage to include total hours and cost of overtime, the total hours and cost of overtime as a percentage of straight-time hours and straight-time cost.

b. Emergency Work - Nonexempt Employees

Work scheduled on less than 36 hours' notice or resulting from a change in schedule made on less than 36 hours' notice is considered emergency work. The time spent by an employee in travel (including travel between home and duty station) required by emergency work is considered as time worked.

c. Exempt Employees

Certain exempt employees who, because of extraordinary circumstances, are required by the Laboratory to work (i) an extended work schedule or (ii) an extended workweek may be paid a premium for such work in accordance with the following schedule:

(1) Exempt employees whose regular annual salary is $50,000 or less may be paid at a rate of time and one-half for all hours worked in excess of 40 hours per week.

(2) Exempt employees whose regular annual salary is in excess of $50,000 may be paid, in addition to their regular salary, at their straight time rate for all hours worked in excess of 40 hours per week.

For the purpose of determining hours worked and calculating payments (under other provisions hereof) based on hours worked, exempt employees on an extended work schedule or an extended workweek may be considered nonexempt employees.

An extended work schedule means work assigned by the Laboratory in excess of 40 hours per week for a period of up to four consecutive weeks. An extended work-week means work regularly scheduled by the Laboratory, in excess of 40 hours per week, for a period in excess of four consecutive weeks.

7. Shift Premiums

a. Weekly Employees

The Laboratory may pay to weekly employees a shift premium of 15 percent of earned pay (regular base pay, plus overtime and holiday premium pay where applicable) for hours worked between 4 p.m. and 8 a.m. of the following day, provided that the shift premium payable to an employee for four hours or less of overtime which immediately follows regularly scheduled work or 20 minutes or less of work immediately preceding his/her regular eight-hour shift may be the same as the shift premium, if any, paid to him/her for such regular scheduled work.

b. Monthly Exempt and Nonexempt Employees

A monthly employee working as an assigned member of a regularly scheduled shift operation may be paid a premium of up to 15 percent of base pay. The premium may be considered a part of regular base pay for the purposes of paying leave (such as vacation, sick leave, military duty leave) taken during such assignment. Excluded are: scientific staff members, supervisors of Police and Fire Captains, supervisors of Operations Engineers, supervisors of Reactor Shift Supervisors, and supervisors on an equivalent level in other organizations.

8. Premium for Nonconsecutive Days Off

If an employee is assigned by the Laboratory to a schedule in which the employee's days off in any workweek are not consecutive, the employee may be paid for all work performed on the day immediately preceding his/her second non-scheduled day at time and one-half plus applicable shift premium, if any.

9. Schedule Change Premium

If a change in employee's schedule involves a change in the employee's day(s) off, and if the change was not announced before the start of the workweek in which the change became effective, the employee's original day(s) off may be deemed unchanged for the purpose of computing overtime.

10. Closing of the Laboratory

The Director, or his duly authorized designee, after consultation with the DOE Contracting Officer whenever possible, may order a closing of the Laboratory whenever he deems it in the best interest of the Laboratory to do so because of some emergency which is general in scope, as, for example, the imminent approach of a hurricane or blizzard or some onsite emergency of a serious nature.

An essential nonexempt employee who is required to work when the Laboratory is closed may be paid at 2 times his regular base rate for all regularly scheduled work performed during such period and may be paid at 2 1/2 times his regular base rate for all other work performed during such period.

11. Special Allowances

a. Reporting Allowance

A nonexempt employee who reports for scheduled work and who is prevented from working all or part of such scheduled work by conditions beyond his/her control, may be paid a reporting allowance up to the amount he would have received if such scheduled work had been performed. An employee who is late to work because of widespread fire, storm, or flood, or because of some other cause acceptable to the Laboratory and beyond the control of the employee, may be considered to have reported for work on time provided that he/she shall have reported for work during the first half of his/her scheduled shift.

b. Overtime Meal Period

A nonexempt employee working more than 10 consecutive hours may be allowed a 30-minute paid meal period. If due to operational requirements an employee is prohibited from taking the full 30-minute meal period, the lost meal time may, for pay purposes, be considered additional time worked.

12. Saturday and Sunday Premiums

A weekly nonexempt employee who actually performs work on a Saturday or Sunday at straight time rates is paid a premium equal to one hour's pay at his/her regular base rate for all work performed on a Saturday and a like premium for all work performed on a Sunday. These Saturday and Sunday premiums shall not be considered as part of "earned pay" for the purpose of computing the shift premium, if any, for such day.

Appendix A - Vacations

1. Full-time monthly employees hired prior to October 1, 1995, accrue vacation credit at the rate of two working days for each month of service. Weekly employees who were hired prior to this date and are later promoted to monthly status will also accrue at this rate.

2. Full-time monthly employees hired after October 1, 1995, will accrue vacation credit based on the following schedule:

Length of Service	Rate of Accrual
Less than 5 years	1-1/2 working days for each month of service
5 but less than 10 years	1-3/4 working days for each month of service after 5th anniversary of employment
10 or more years	2 working days for each month of service after 10th anniversary of employment

3. Full-time weekly employees accrue vacation credit based upon length of service as follows:

Length of Service	Rate of Accrual
Less than 5 years	1 working day for each month of service
5 but less than 10 years	1-1/4 working days for each month of service after 5th anniversary of employment
10 but less than 15 years	1-1/2 working days for each month of service after 10th anniversary of employment
15 or more years	2 working days for each month of service

In addition, full-time weekly employees are given a one-time vacation credit of three working days on attaining the 10th anniversary of their employment with the Laboratory.

4. Eligible part-time employees are entitled to vacation credit on the same length-of-service basis as full-time employees. However, the credits given each month, or on the 10th anniversary in the case of weekly employees, are prorated according to their official work schedule.

No employee may carry over from one fiscal year to the next more than 31 working days of accrued vacation credit unless prevented by the Laboratory from taking his/her vacation. The Director may restore to any employee the vacation credit lost.

An employee on vacation or absent from work for personal reasons may be paid at this regular base rate against charge to his/her accrued vacation credit. The Laboratory may advance up to 10 days of vacation credit to an employee with at least three months of full-time employment.

If an employee is rehired, previous periods of three or more years continuous service will be counted in computing the vacation accrual rate.

Upon termination of an employee's employment by, or appointment with, the Laboratory, the Laboratory may pay all his/her accrued vacation credit to him/her, or, in the event of termination by death, to his/her spouse or estate. An employee granted a leave of absence may be paid his/her accrued vacation credit.

Appendix A - Sick Leave

1. Wage Continuation

An employee absent on a scheduled workday due to illness or injury is paid at his/her regular base rate against charge to his/her sick leave credit. An employee may use up to five days of accrued sick leave in any calendar year to provide care to a spouse, parent or child.

2. Sick Leave Credit

Effective October 1, 1995, each full-time employee is granted 1-1/4 days of sick leave credit upon his/her first day of employment, and an additional 1-1/4 days on each subsequent first day of the month of full-time employment up to a maximum sick leave credit of 108 days at the end of any payroll reporting period. Each eligible part-time employee is also granted sick leave credit up to a 108-day maximum, but the rate of accrual is prorated according to the official work schedule of each such employee. Each temporary employee is granted 1-1/4 days sick leave credit on each subsequent first day of the month of full-time employment.

If an employee's illness extends over a continuous period in excess of 18 calendar days and of the employee's accumulated sick leave credit, the employee is granted additional sick leave credit up to a maximum of 12 days in any calendar year.

Whenever these allowances prove insufficient to provide payments in lieu of wages (or salary) to a sick or injured employee during the period of his/her incapacity, the Personnel Director may grant additional sick leave credit to each sick employee to provide payments in lieu of wages for whatever additional period may be necessary up to a maximum period of six calendar months.

Employees will be permitted a limited number of hours without loss of pay or charge to sick leave for doctor or dentist visits. Nonexempt employees will be limited to a maximum of eight hours per year and exempt employees will obtain supervisory approval consistent with Laboratory policy.

3. Supplemental Payments

Supplemental payments are made (on application) to a full-time employee and a eligible part-time employee for absences on scheduled workdays due to a disability covered by the New York State Disability Benefits Law in accordance with the following:

a. When a full-time regular or eligible part-time employee has received covered sick leave pay for fewer than 26 weeks during the preceding 52 weeks and his/her sick leave credit is exhausted, supplemental payments at the rate currently required by the New York State Disability Benefits Law will be made for the number of weeks required to bring the combined total of covered sick leave pay and weeks of supplemental pay to 26.

b. When a temporary full-time or other part-time employee has sick leave credit, the Laboratory will pay statutory benefits to which such employees are entitled under the New York State Disability Benefits Law up to a maximum of 26 weeks.

c. When a temporary full-time or other part-time employee has no sick leave credit, the Laboratory will pay statutory benefits to which such an employee is entitled under the New York State Disability Law up to a maximum of 26 weeks.

5. Compensation Awards

In the event of an occupational illness or injury of an employee, the charge to his/her sick leave credit may be reduced to one half (1/2) day per day of absence. The employee's sick leave pay is deemed to include any Worker's Compensation Benefits to which the employee is entitled except:

a. If a Worker's Compensation award exceeds the sick leave payments made the employee will receive the excess; and

b. In the event the Laboratory is reimbursed from a compensation award for wages paid to the employee while absent as a result of a work-incurred injury, the Laboratory will restore sick leave credit to the employee up to extent of reimbursement.

c. The combination of sick leave pay and compensation award payments shall not exceed one hundred percent (100%) of the employee's pay.

6. Application of Sick Leave

If an employee suffers illness or injury during his/her vacation, the period of his/her illness or injury may be charged against his/her accrued sick leave credit rather than his/her vacation credit. A holiday observed on a scheduled workday of an employee on sick leave will not be charged against his/her sick leave credit.

7. Terminated Employees

No employee will be paid for sick leave credit unused at the termination of his/her employment. However, the New York Disability Benefits Law requires payment of certain benefits to terminated employees who are or became disabled within a stated period. The Laboratory pays such benefits to terminated employees in accordance with such law.

8. Sick Leave Repurchase Plan for Nonexempt Employees

When the accrual of sick leave of a nonexempt employee for any monthly reporting period would cause his/her accumulated credit to exceed the 108 days' maximum credit allowable under 2-C-1, Paragraph 2, the excess shall be recorded to the employee's credit and paid for at the end of the calendar year at the rate of one day's pay for each four days so credited.

Appendix A - Holidays

1. Holidays

The Laboratory designates 11-1/2 days in each calendar year as observed holidays. These holidays include:

New Year's Day	Labor Day
Presidents' Day	Veterans' Day
Memorial Day	Thanksgiving Day
Independence Day	Friday after Thanksgiving
	Christmas Day

Two additional holidays are designated by the Laboratory each year and announced during January of each year. In addition, the last four hours of scheduled work preceding the Christmas holiday are designated as a half-holiday. Holidays occurring on a Saturday are observed on Friday, and holidays occurring on a Sunday are observed on Monday.

With the approval of DOE, the Director may declare a "Special Holiday" at the Laboratory in response to a Presidential proclamation (e.g., the observance of a national day of mourning). The Laboratory will consider any closing of this nature as a holiday when computing pay for employees.

2. Holiday Pay

a. Weekly Employees

Each weekly employee who is excused from work on an observed holiday may be granted holiday pay equal to eight hours' pay at his/her regular base rate; if his/her scheduled day off falls on an observed holiday, he/she may accrue one additional day of vacation credit.

A weekly employee who is required to work on an observed holiday may be paid, in addition to eight hours holiday pay, at 1-1/2 times his/her regular base rate for the first eight hours and at 2-1/2 times his/her regular base rate for all hours in excess of eight hours worked in the holiday period.

If any such payment to an employee does not equal or exceed four hours' pay at his/her regular base rate, such employee may be paid in addition to holiday pay, four hours' pay at his/her regular base rate (plus shift premium, if any), for such holiday work.

b. Monthly Employees

A monthly nonexempt employee who is required to work on an observed eight hours holiday may be paid in addition to holiday pay, at one times his/her regular base rate for the first eight hours and at two times his/her regular base rate for all hours in excess of eight hours worked.

A monthly employee whose scheduled day off falls on an observed holiday shall accrue one additional day of vacation credit.

A monthly exempt employee who is required by the Laboratory to work on an observed holiday may accrue one additional day of vacation credit.

Appendix A - Miscellaneous Leave With Pay

1. Death Leave

An employee may be allowed up to three days' absence with pay at their regular base rate for death in the immediate family--death of wife, husband, mother, father, daughter, son, sister, brother, grandmother, grandfather, mother-in-law, and father-in-law; and also any other family member residing in the household of the employee. An employee may be allowed one day of absence with pay at their regular base rate for death of any other family member other than the immediate family defined above.

2. Military Leave

An employee may be granted leave with pay not to exceed two calendar weeks per fiscal year for active training duty in the armed forces reserve of the United States. Pay allowed for such leave will not exceed the difference between the employee's base pay for the period of leave and their military pay (base plus service premium, but excluding allowances and Saturday and Sunday pay) for the same period.

An employee may be granted leave with pay not to exceed two calendar weeks for each tour of duty when required to serve on temporary duty in the armed forces reserve of the United States during civil disturbances or other similar emergencies. Pay allowed for such leave will not exceed the difference between the employee's base pay and their military pay excluding allowances for this same period.

An employee may be granted leave with pay when serving in the armed forces reserve on long-term leave up to a total of 180 days for each occurrence of National Emergency conditions. Pay allowed for such leave will not exceed the difference between the employee's base pay and their base military pay excluding allowances for the same period.

3. Leave for Attendance at Court

An employee may be granted leave with pay for jury duty or for a court appearance where the Laboratory has an interest.

4. Voting Time

An employee may be granted necessary time off with pay in order to Vote on Election Day (as designated by law).

5. Bargaining Unit Activity

Pay for absences from work by employees acting in the capacity of union officers, union stewards and committeemen for time spent in handling grievances, negotiating with the Laboratory, and serving on labor management (Laboratory) committees, are allowable.

Appendix A - Leave of Absence

1. Regular Leave of Absence

This nonpay status removes the employee from the active rolls of the Laboratory. All employees are eligible for leave for a period of up to one (1) year with an extension of up to an additional year upon approval of the Director of the Laboratory.

The Laboratory will make no retirement contributions. Group Health, Life and Long-Term Disability insurance based on normal salary will be continued, provided that the employee continues to pay the employee group insurance premium based on normal salary.

No sick leave or vacation credit is accrued, nor is there eligibility for holiday pay.

2. Part-Time Leave of Absence

All employees are eligible for leave for a period of up to one (1) year with an extension of up to an additional year upon approval of the Director of the Laboratory.

Laboratory retirement contributions based on the employee's normal salary will be continued. Group Health, Life and Long-Term Disability insurance based on normal salary will be continued, provided that the employee continues to pay the employee group insurance premium based on normal salary.

Salary and accrual of sick leave and vacation credit will be pro-rated according to the employee's schedule.

3. Professional Advancement Leave of Absence

Full-time staff members with the rank of Scientist or Senior Scientist are eligible. This type of leave is granted to further the scholarly pursuits or professional stature of the recipients and to increase the value of their further services to the Laboratory.

Leave credit accumulates at the rate of one month for each year of service (not including periods of leave) in the rank of Associate Scientist, Scientist, or Senior Scientist to a maximum of 12 months. The number of months of leave at full pay taken at any one time may not exceed the leave credit. The number of months of leave at half salary or nonsalaried leave taken at any one time may not exceed twice the leave credit, or 12 months, whichever is less.

Leave at full pay is not intended for teaching; part-time teaching is permitted on leave at half pay.

Laboratory retirement contributions based on the employee's full-time salary will be continued. Group Health, Life and Long-Term Disability insurance based on full-time salary will be continued, provided, that the employee continues to pay the employee group insurance premium based on full-time salary.

No sick leave or vacation credit is accrued.

In the case of employees on non-salaried leave of absence, the Laboratory may pay retirement and insurance premiums (both employer and employee shares) to the extent that they are not paid by the institution or organization providing the stipend, grant or fellowship.

4. Gradual Retirement

For scientific staff members, gradual retirement status may be granted after the employees 60th birthday for a period not to exceed five (5) years. At the end of the agreed period, the staff member agrees to retire from the Laboratory.

Laboratory retirement contributions based on the employee's full-time salary will be continued. Group Health, Life and Long-Term Disability insurance based on full-time salary will be continued, provided that the employee continues to pay the employee group insurance premium based on full-time salary.

Employees on gradual retirement affected by a layoff will receive termination pay in accordance with Section 2H, however, such pay will be reduced by the Supplemental Laboratory Retirement Contribution made under this policy.

Salary and accrual of sick leave and vacation credit will be pro-rated according to the employee's schedule.

Appendix A - Termination

1. Termination of Individual for Administrative Convenience

An employee dismissed for the administrative convenience of the Laboratory may in appropriate circumstances be given a termination payment of one month's pay at his/her regular base rate in the case of a monthly employee and of two weeks' pay in the case of a weekly employee.

An individual employee may be considered for other termination pay for other administrative reasons with the approval of the Director and the Contracting Officer.

2. Severance Pay

Severance payments made to an employee will be reimbursable under this contract when provided in accordance with the following provisions:

a. No employee: (1) who accepts a transfer to another facility, subsidiary, or affiliate of the Contractor, (2) who is offered employment at comparable pay and benefits by successor Contractor, (3) who resigns, or (4) who is discharged for cause, will be eligible for severance pay.

b. Should an employee be rehired in the period covered by severance pay, the employee will be responsible for refunding the remaining balance of severance pay.

c. The Contractor's severance pay plan, and any changes to the plan, are subject to Contracting Officer approval, unless stipulated in a bargaining unit agreement.

d. Severance payments may be made at the Laboratory's option to an employee within a Reduction-in-Force grouping who is not scheduled for termination but who offers to terminate employment, thereby eliminating the need for terminating another employee involuntarily.

e. The Laboratory will advise DOE of all Reductions-in-Force prior to their initiation. Upon completion, and at the end of each fiscal year, the Laboratory will provide DOE with a report to the extent of such Reduction-in-Force.

f. Severance pay may be made in accordance with the following separation allowances in addition to benefits under unemployment compensation laws.

Years of Service	Severance Payment
First 10 years:	1 week for each year
Over 10 years through 15 years:	1-1/2 weeks for each year over 10 years
Over 15 years:	2 weeks for each year over 15 years

Employees with less than one (1) year of service are credited with a full year service. For the final year of employment, service is computed in quarterly (three-month) increments with a full quarter's credit given for any fraction of a quarter attained. Allowances for eligible part-time employees will be prorated in accordance with the employee's official work schedule.

Effective October 1, 1995, the maximum severance pay allowance is 39 weeks.

3. Termination at Retirement

Each weekly wage employee with a minimum of five years' service retiring on or after his/her 55th birthday and whose combination of age and service equal 70, may be given up to two weeks' pay at his/her regular base rate.

4. Termination of the Contract

Offerors may propose specific language regarding proposed benefits for the scientific and professional staff of the Laboratory in the event of contract termination as part of the offeror's proposed Laboratory Staffing Plan [see Section L.38 (a)(1)(ii)b]. No employee can receive any proposed benefit in addition to their severance pay. The employee is entitled only to receive the greater of the two benefits.

5. Security Suspension Pay

If the access authorization of an employee is suspended by direction of the Operations Office Manager, the Contractor shall transfer the employee to work not requiring access if such work is available.

In the event a job transfer is not arranged, the employee's base compensation shall be discontinued and the employee shall be placed on leave of absence effective the date that the Contracting Officer provides written notification to the Contractor and shall remain on leave of absence until final disposition of the case under the Department of Energy procedure, 10 CFR Part 710.

In the event the employee whose access authorization has been suspended is transferred to another position where such access authorization is not required, compensation shall, thereafter, be the base wage or salary received by employees in the position transferred into, and such compensation shall continue until final disposition of the case under the Department of Energy procedure, 10 CFR Part 710.

A. Appendix A - Bargaining Unit Employees

Employees in recognized collective bargaining units are governed by the provisions of the applicable collective bargaining agreement entered into by the Laboratory and the Union representing such unit. The collective bargaining agreements referred to in this paragraph are attached hereto and made a part hereof as Attachments I, II, and III:

1. International Brotherhood of Electrical Workers, Local Union 2230, August 1, 2000, through July 31, 2003 (Attachment I).

2. Suffolk County Security Police Association, October 1, 2001 through March 31, 2006 (Attachment V).

3. Paper Allied-Industrial, Chemical and Energy Workers International Union AFL-CIO, Local No. 1-431, October 1, 1999 (Attachment III) as amended by Attachment IV, effective January 1, 2002. Page 20 of the contract booklet has been eliminated.

The Laboratory is authorized to administer these agreements in accordance with their terms. The provisions of Appendix A are applicable to such employees only to the extent permitted by these collective bargaining agreements.

B. Collective Bargaining Provisions

Upon receipt of any Union proposals and/or preliminary to any negotiation concerning any collective bargaining agreement or amendment thereto affecting employees engaged in work under this contract, the Contractor shall meet with the Contracting Officer or designee(s) for the purposing of reviewing

bargaining objectives respecting any significant change in existing labor agreements which can be calculated to affect allowable costs under this contract or which could involve other items of special interest to the Government.

The Contractor shall keep the Contracting Officer advised of significant developments during any negotiations and shall promptly advise (within 24 hours) the Contracting Officer of labor relations developments which involve, or appear likely to include, such matters as: Strike situations or picketing at the facility; referral to the Energy Labor-Management Relations Panel, the National Labor Relations Board at any level or the Federal Mediation and Conciliation Services; recourse to procedures under the Labor-Management Act of 1947, as amended; any other Federal or state labor law involving an issue with cost implications; any arbitrations that are potentially precedent setting or of anticipated high cost; and any unfair labor practices, election petitions or law suits related to labor or mediation activities.

The Contracting Officer shall be advised of the initiation of any action by the Contractor under the Labor Management Relations Act of 1947, as amended, and/or involving the National Labor Relations Board.

The Contractor recognizes that the Department of Energy retains authority on matters of security; that this authority may not be limited by collective bargaining agreements; and that the Contracting Officer will be promptly notified of any matter arising out of negotiations or administration of labor agreements where the Department of Energy's authority in matters of security may be impinged.

The Contractor shall submit a summary report of all labor arbitration cases which have occurred throughout the year and their resolution or status to the Department of Energy on an annual basis. The Contractor shall promptly provide to the Department of Energy a copy of each collective bargaining agreement and modifications thereto.

Awards paid by the Laboratory in accordance with determinations reached in grievance or arbitration procedures are allowable.

Appendix A - Travel - Eligible Persons

The following persons are eligible for reimbursement of travel expenses in accordance with section 3-B:

1. Employees and consultants while engaged in work relating to the scientific or administrative business of the Laboratory;

2. Employees while in attendance at scientific or professional meetings which may be expected to benefit the Laboratory directly or indirectly, as by enhancing the scientific or professional knowledge of employees;

3. Collaborators (and their families), visitors and speakers, while engaged in travel relating to an appointment with or an approved visit to the Laboratory, or while serving on appointment at the Laboratory, in connection with the performance of work relating to the scientific or administrative business of the Laboratory;

4. Employees and prospective employees, and their families, while making a change of residence required by a change in such employee's place of assignment for the convenience of the Laboratory, or the change required by a new employee's affiliation with the Laboratory or with DOE approval by termination of his/her employment with the Laboratory within three years of the date of his/her employment.

   Where relocation costs incurred incident to recruitment of a new employee have been allowed, and the newly hired employee resigns for reasons within his/her control within 12 months after hire, the individual shall be required to refund or credit such relocation costs; and

5. An applicant for a position with the Laboratory while engaged in travel relating to an interview made at the Laboratory's request. While at the Laboratory on such visit, such person and their spouse may be given meals in lieu of a per diem allowance for the day.

Appendix A - Travel - Reimbursable Expenses

Persons Eligible for reimbursement under section 3-A may be reimbursed as follows:

1. Transportation

   a. Reimbursement for use of private vehicle, when more advantageous to the Laboratory than use of commercial transportation is at a rate in accordance with the Federal Travel Regulations (FTR), plus bridge, road and ferry tolls. When permitted for the convenience of the traveler, reimbursement should be such that additional costs are borne by the traveler and not by the Laboratory. Mileage shall not be more than one hundred ten percent (110%) of the most direct route per Rand-McNally.

   b. Public Carrier:

      (i) Actual cost of commercial transportation, except that air fare reimbursement is limited to less than first-class accommodations, the cost of which shall not exceed the lowest available commercial discount airfare, Government contract airfare, or customary standard (coach or equivalent) commercial airfare as determined by the Laboratory. Less than first-class accommodations are considered not reasonably available where less than first-class accommodations would, for example:

         (A) require circuitous routing;

(B) require travel during unreasonable hours;

(C) excessively prolong travel;

(D) result in additional costs which would offset the transportation savings;

(E) offer accommodations which are not reasonably adequate for the physical or medical needs of the traveler;

(F) not meet necessary mission requirements.

(ii) First class accommodations are specifically authorized or approved by the Contracting Officer when deemed necessary for the conduct of the mission.

(iii) Authorized Rental Car: Actual expense when authorized by the Laboratory

(iv) Rented or chartered aircraft: Actual expense when authorized by the Laboratory and as by the Contracting Officer.

2. Subsistence Expenses

a. Lodging plus Per Diem

For travel in the Continental United States (CONUS) involving one or more overnight stops, reimbursement for lodging, meals and incidental expenses shall be at the rate established for the applicable locality under Federal Travel Regulations (FTR). The applicable rate (allowance) shall be determined by the travel status and location of the individual at 12:00 midnight and whether lodging is required at such location. When lodging is required on the day travel begins (day of departure from the official station or other authorized point), the allowance shall be the maximum amount for lodging allowed by the FTR plus the pro-rated (if applicable) portion of the per diem (meals and incidental expenses - M&IE). For the day travel ends (when the employee returns to the official station or authorized point), the per diem allowance from the preceding calendar date shall

be the prorated (if applicable) portion allowed. The per diem portion of the allowance (M&IE) is calculated for partial days by prorating using one fourth of the allowance for each six hour period or fraction thereof. A day begins at 12:01 a.m.

b. Travel of Less Than 24 Hours

No per diem (M&IE) allowance will be allowed for travel begun and completed between the hours of 0800 and 1800 on the same day, with the exception of Saturdays, Sundays and Holidays. Per diem will be allowed for travel in excess of six hours, occurring in a single day, if travel is begun prior to 0800 or continued beyond 1800. In this circumstance, the travel period will be divided into 6 hour periods starting from the actual time travel begins and ending with their completion at home, office or other authorized point. For each six-hour period or fraction thereof, one-fourth of the applicable per diem (M&IE) rate will be allowed. The maximum per diem (M&IE) allowance shall not exceed the rate established for the Suffolk County, New York locality under the FTR.

c. Meals and Incidental Expenses

When meals are furnished without charge, an appropriate deduction to the individual's per diem allowance shall be made. For travel incurred in accordance with 2 a. or 2 b., the per diem (M&IE) rate shall be adjusted in accordance with the FTR.

In either case the individual amount of deductions made on partial days shall not cause the individual to receive less than the amount allocated for incidental expenses.

d. Dependents Travel

When individuals are entitled to allowances for family members, the rate for spouses and other immediate family members age twelve and older is based on three-fourths of the maximum allowance which applied to the traveler. Children under the age of twelve are included based on a maximum rate calculated at one half the maximum allowance applied to the traveler.

e. Foreign Travel

Allowances payable for official travel within localities outside CONUS will be at rates not to exceed the maximum rates established under:

(i) Non-foreign areas outside CONUS. The allowances payable for official travel in non-foreign areas shall not exceed the maximum rates established by the Secretary of Defense and listed in civilian personnel per diem bulletins published periodically in the Federal Register. The term "non-foreign areas" includes the states of Alaska and Hawaii, the Commonwealth of Puerto Rico, and the possessions of the United States.

(ii) Foreign areas. Allowances payable for official travel in foreign areas shall not exceed the maximum rates established by the Secretary of State and published in the per diem supplement to the standardized regulations (government civilians, foreign areas). The term "foreign areas" includes any area (including the trust territory of the Pacific Islands) situated both outside CONUS and the non-foreign areas as described in e.(i) above.

The applicable rate (allowance) shall be determined by the travel status and location of the individual at 12:00 midnight and whether lodging is required at such location.

In addition to the above, travelers are entitled to an enroute rate of $17.00 on the day their trip begins within CONUS, and $25.00 for the day of return. The sum of the two enroute rates, plus the daily allowances for each city where lodging is taken, equals the maximum allowable rate for any outside CONUS (CONUS) trip.

When all or part of the meals and/or lodging are furnished at no cost or at a nominal cost to the employee by the Federal Government or others, the applicable maximum per diem rate or the M&IE rate, as appropriate, shall be reduced to a daily amount commensurate with the remaining expenses expected to be incurred by the employee. If a reduced per diem rate was not authorized in advance of the travel, an appropriate deduction shall be made from the total per diem payable on the travel voucher.

f. In special or unusual situations, contractor employees may be paid for actual expenses in excess of the above referenced maximum per diem rates provided such payments do not exceed the higher amounts authorized by the Federal Travel Regulations at the time of travel and provided all of the following conditions are met:

(1) Special circumstances exist which are similar to or consistent with the description of conditions warranting approval of the actual expense method as set forth in the Federal Travel Regulations, prescribed by the General Services Administration, for travel in the conterminous 48 United States.

(2) A written justification for payment of the higher amounts is approved by a Department Chairman or Division Head or their Deputy.

(3) Documentation exists to support the payment of actual lodging expenses.

3. Research Collaborators who plan to remain at the Laboratory for at least 60 calendar days and persons eligible under paragraph 4 of section 3-A may be reimbursed for the actual cost of packing and unpacking, transporting, storing and removing household goods from storage.

4. Purely personal expenses, such as personal telephone calls [except one personal call per week of travel (or portion thereof) and any additional calls deemed necessary due to unusual circumstances, i.e., family illness, emergencies, disasters, etc.] and valet services, are not reimbursed even though incurred in the course of a trip.

5. Allowable miscellaneous expenses: Expenses other than those specified below require the approval of the Director or his designee.

   a. Rental of necessary office equipment
   b. Stenographic and word processing services
   c. Rental of rooms for official business
   d. Clerical services
   e. Excess baggage charges (air travel)
   f. Storage charges for baggage
   g. Official telephone and telegraph
   h. Tolls
   i. Ferry
   j. Limousines and Taxis, including a gratuity of up to a maximum of 15 percent. Taxi fares to and from restaurants are not reimbursable, unless there is no restaurant in or near the lodging.
   k. Public carriers, e.g., bus, subway and streetcar
   l. Passports, visas, and tourist cards, including necessary travel to obtain same
   m. Travelers' check service
   n. Foreign currency exchange loss
   o. Debarkation taxes
   p. Innoculations
   q. Registration fees for meetings
   r. Parking when authorized by the Laboratory in accordance with 1.a. or 1.b.(iii).

6. Relocation Expenses

a. Actual cost of packing, transporting, storing, removing from storage and unpacking of household goods; transit insurance; and the transportation of one automobile.

b. Cost of finding a new home, such as advance trips by employees and spouses to locate living quarters, and temporary lodging during the transition periods, not exceeding separate cumulative totals of sixty (60) days for employees and forty-five (45) days for spouses and dependents, including advance trip time.

c. Other necessary and reasonable miscellaneous expenses, not to exceed one thousand dollars ($1,000), incident to relocation, such as disconnecting and connecting household appliances; automobile registration; driver's license and use taxes; cutting and fitting rugs, draperies and curtains; and forfeited utility fees and deposits.

d. In addition to the above, with the approval of the Director, the following relocation costs may be reimbursed to employees in the following salary grades: all management grades; Scientific Staff (Asst. Scientist and above); Professional Schedule (Grades P7 and above); and Administrative (Grades A8 and above):

(1) Closing costs (i.e., brokerage fees, legal fees, appraisal fees, points, finance charges, etc.) incident to the disposition of actual residence owned by the employee when notified of transfer or hire; provided that closing costs when added to the continuing costs described in d.(3) below shall not exceed fourteen percent (14%) of the sales price of the property sold.

(2) Costs incident to the acquisition of a home in a new location, except that these costs will not be allowable for existing employees or newly recruited employees who, prior to the relocation, were not homeowners, and the total costs shall not exceed five percent (5%) of the purchase price of the new home.

(3) Continuing costs of ownership of the vacant, former, actual residence being sold, such as maintenance of building and grounds (exclusive of fixing-up expenses); utilities; taxes; property insurance; mortgage interest; etc., after settlement date or lease date of new permanent residence; provided that when added to the closing costs described in d.(1) above, the costs shall not exceed fourteen percent (14%) of the sales price of the property sold.

(4) Mortgage interest differential payments, except that these costs are not allowable for existing or newly recruited employees who, prior to the relocation, were not homeowners, and the total payments are limited to an amount determined as follows:

(i) difference between the mortgage interest rates of the old and new residence times the current balance of the old mortgage times three (3) years; and,

(ii) when mortgage differential payments are made on a lump-sum basis and the employee leaves or is transferred again in less than three (3) years, the amount initially recognized shall be proportionately adjusted to reflect payments only for the actual time of the relocation and the employee shall pay the difference.

(5) Rental differential payments (paid on a monthly basis) covering situations where relocated employees retain ownership of a vacated home in the old location and rent at the new location. The rented quarters at the new location must be comparable to those vacated, and the allowable differential payment may not exceed the actual rental costs for the new home, less the fair market rent for the vacated home times three (3) years.

(6) Cost of canceling an unexpired lease.

e. The following types of costs will not be reimbursed:

(1) Loss on sale of home.

(2) Continuing mortgage principle payments on residence being sold.

(3) Costs incident to the acquisition of a home in a new location as follows:

(i) real estate brokers' fees and commissions;

(ii) costs of litigation;

(iii) real and personal property insurance against damage or loss of property;

(iv) mortgage life insurance;

(v) owner's title policy insurance when such insurance was not previously carried by the employee on the former residence(however, costs of a mortgage title policy is allowable); and

(vi) property taxes and operating or maintenance costs.

(4) Payments for employee's income taxes or FICA (Social Security taxes) incident to reimbursed relocation costs.

(5) Costs incident to furnishing equity or nonequity loans to employees or making arrangements with lenders for employees to obtain lower-than-market rate mortgage loans. Such costs do not include points and finance charges by lenders which are specifically allowable under paragraph 6. d. above.

f. Relocation costs are costs incident to the permanent change of duty assignment (for an indefinite period or for a stated period of not less than twelve (12) months). If relocation costs for an employee have been allowed and the employee resigns within twelve (12) months for reasons within the employee's control, it is expected the employee shall refund or credit the relocation costs to the Laboratory for credit against its prime contract within DOE.

7. Exceptional Recruitment Allowance

Relocating new employees not eligible for closing costs or costs incidental to the purchase of a new home under section 3-B-6 d., may be paid an Exceptional Recruitment Allowance to reimburse them for actual costs related to relocation, up to a maximum of ten thousand dollars ($10,000).

Examples of such expenditures are: closing costs incidental to the purchase of a house; rental differential; or other relocation costs validated by submission of a receipt. Employees in the following salary grades will be eligible: all management grades; Scientific Staff (Asst. Scientist and above); Professional Schedule (Grades P7 and above); and Administrative (Grade A8 and above). Approval by the Director is required.

Appendix A - Authorization and Voucher Approvals

In addition to any approvals required under other provisions of this Contract, all travel authorizations and vouchers shall be approved in accordance with the Laboratory's signature authorization control policy.

Appendix A - Travel - Housing for Temporary Appointees

1. Temporary Appointees

   a. When suitable on-site housing is not available for them, the Laboratory may reimburse persons who receive temporary appointments to the Scientific Staff during the months of June, July, August and September, as well as Research Collaborators spending extended periods of time at the Laboratory during the summer months, for excess rentals in accordance with the following conditions:

      1. The excess rental to be reimbursed is the difference between the rental for a Laboratory apartment of the size which would normally be assigned to a summer appointee and the actual cost of reasonably similar accommodations off the site, if available.

      2. The excess rental for which reimbursement is provided will not exceed $400 per month.

      3. Authorization for reimbursement of excess rental is, in every case, approved by the Director of the Laboratory or his designee.

   b. Because Research Collaborators receive no salary for their work at the Laboratory, the deduction equivalent to on-site rental is not made.

Appendix A - Travel - Post Allowance - Foreign Assignment Change of Station

Foreign Assignment Change of Station

Where an assignment of a BNL employee results in living costs for the employee and his/her family which are in excess of those which the employee would have incurred were he/she to remain at his/her regular place of employment, the employee may be compensated for these additional living costs. Payment on a per diem basis, will be based upon the approximate difference between the normal expenditures of the employee at his/her usual place of abode, and the cost of reasonably equivalent items at the place of his/her foreign assignment, for such items as normal household costs, including local transportation and children's education, and if applicable, storage of furniture and household effects including moving into and out of storage. Subtracted from these and other valid additional expenses will be any extra income generated (1) by renting of the employee's home, and (2) from the tax advantage occurring to those working abroad for 11 months or more. In addition, family size as well as the employee's tax situation will also be considered in BNL's determination for per diem allowance. In no event will the total per diem, adjusted for living costs abroad, exceed "The U.S. Department of State Indexes of Living Costs Abroad and Quarters Allowances" published by the U.S. Department of Labor, Bureau of Labor Statistics.

APPENDIX A

EMPLOYEE INSURANCE AND RETIREMENT PROGRAMS

Brookhaven National Laboratory
Operated by
Brookhaven Science Associates

Brookhaven National Laboratory

Operated by

Brookhaven Science Associates
Under Contract No. DE-AC02-98CH10886 With

The United States Department of Energy

Appendix A - Retirement Plans

General

All employees who meet the participation requirements, indicated below, are covered by the Contractor's defined contribution retirement programs:

- Regular Retirement Plan
- Voluntary 401(k) Retirement Plan

The Department of Energy will reimburse the Contractor's contributions as agreed to in the Appendix.

The Contractor will be reimbursed for necessary and reasonable costs involved in implementing, administering, and funding the above-referenced approved retirement plans. Any change in plan benefits and/or costs not required to maintain qualification under Section 401 of the Internal Revenue Code will require Contracting Officer approval. The Contractor will notify the Department of Energy of any change required solely to maintain qualification under Section 401 of the Internal Revenue Code.

Provisions of this section are subject to successful negotiations with the Program's service providers including, but not limited to investment organizations, insurance companies, etc. Further, these provisions will be subject to and superseded by any law or regulation with which they might conflict.

A. Regular Retirement Plan

1. General

BSA will provide its eligible employees with a defined contribution type retirement plan, with BSA contributions being made at the participants' election to one or more of the following investment organizations: Teachers Insurance and Annuity Association (TIAA) and the College Retirement Equities Fund (CREF), Fidelity Investment Service Company, and the Vanguard Group.

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2. Participation

All employees employed before January 1, 2001, who work at least 1000 hours per year, who have attained age 21 and have completed two (2) years of continuous BSA service or have attained age 30 and have completed three (3) months of continuous BSA service, shall participate in the BSA Retirement Plan. All employees employed on or after January 1, 2001, who work at least 1000 hours per year, who have attained age 21 and have two (2) years of continuous BSA service shall participate in the BSA Retirement Plan. Prior service credit for participation shall be given for comparable eligible service with AUI and for employees who transfer directly to BSA from the Research Foundation of State University of New York (RFSUNY), the University of Stony Brook (USB), and Battelle Memorial Institute (BMI).

3. Contribution by Employer

BSA shall contribute for each participant an amount equal to 10 percent of base salary.

4. Collection and Applications of Contributions

BSA shall make its contributions to TIAA and/or CREF, Fidelity Investments, or Vanguard in such percentages as the participant may elect. The percentages of the combined sum may be changed by the participant on a monthly basis.

5. Benefits

The contracts issued by the investment organizations as part of the Retirement Plan shall be issued to the participant. The rights and benefits of each participant, which are fully vested, shall be those set forth in the contracts.

The contracts of each employee whose employment by BSA is terminated (other than by death) shall remain in force. Participants who terminate employment from BSA are entitled to have the investment organization repurchase their contracts in accordance with the rules and regulations in effect at the time of termination.

Upon retirement, a number of annuity settlements are available to the employee, as described in the various investment organizations' booklets. In addition, a retirement option of a lump-sum settlement up to the maximum provided by the contract provisions of the various investment organizations is permitted.

6. Amendment Authority

While it is expected that this Plan will continue indefinitely, the BSA Board of Directors reserves the right to modify or discontinue it at any time, provided, however, that such modification or discontinuance shall not be applicable to this contract unless approved by the Department of Energy. Any discontinuance or modification of the Plan shall not affect the benefits accrued by participants prior to the date of discontinuance or modification.

7. Reporting Requirements

The Contractor shall submit to the Department of Energy copies of each IRS Form 5500 and accompanying schedules, an annual accounting report and other information concerning the defined contribution plans which the Contracting Officer may require. The annual accounting report shall include a development of aggregate forfeitures and all plan data for individuals generating those forfeitures.

8. Contract Termination/Expiration

Upon contract termination, the individual employee accounts in the defined contribution plans shall be handled in accordance with the provisions of the Employee Retirement Income Security Act of 1974 (ERISA) as amended, and the accounts will vest 100 percent immediately. The Contractor shall inform the plan participants of (a) their right to roll these accounts over into a successor contractor's qualified deferred compensation plan, if such a plan exists, and (b) the consequences of failing to do so, and (c) other applicable rights based on regulatory requirements.

9. The Contractor shall not terminate any Department of Energy reimbursed benefit plan without the Department of Energy's approval. It is the intention of the Department of Energy not to entertain any enhancements in these programs after the Contractor announces the intention not to renew the Contract.

10. If the Contract terminates and there is no replacement Contractor, the Department of Energy, subject to the availability of appropriated funds, will make available, to the Contractor in a timely manner sufficient funds so that the Contractor has no out-of-pocket expenditures from corporate funds to cover all liabilities incurred under this Contract relating to Contracting Officer-approved Retirement Plans. If so requested by the Department of Energy at the time of contract termination or expiration, the Contractor will continue as the sponsor of these plans until all liabilities of such plans are discharged.

B. Voluntary Employee Contributions to Other Retirement Program Options {401 (k)}

1. General

Employees are encouraged to make voluntary contributions to one or more of the following retirement programs to the extent permitted by law in order to supplement the retirement income available to them from Social Security and from the BSA Regular Retirement Plan:

a. 401(k) individual accounts with Teachers Insurance Annuity Association (TIAA) and/or the College Retirement Equities Fund (CREF); and

b. 401 (k) accounts invested in regulated investment companies (mutual funds).

These voluntary retirement income programs, and the manner in which employee funds may be automatically transmitted to them by the Payroll Office, are described in the following sections.

2. Contributions by Salary Reduction

The 401 (k) plan allow employees to elect a deferred income tax option rather than, or in addition to, the salary deduction provision. The option allows for the deferral of income tax payments on the employee's contributions until after the start of retirement income. Under this option, each employee may elect to have base salary reduced by an amount that is not more than the maximum permitted by the Internal Revenue Code. At the

election of the participant, the amount of the reduction shall be transmitted by BSA, on behalf of the employee, either to a TIAA and/or CREF retirement annuity, and/or to an eligible investment account, in such proportion as the participant may designate.

a. TIAA and/or CREF retirement annuities may be purchased through the deferred income tax option as well as through the salary deduction program outlined below in section 3;

b. The Internal Revenue Code also permits placement of retirement funds in certain accounts to be invested in stock of regulated investment companies. Employees may elect that retirement funds available through salary reduction be invested in whole or in part in such an account. To the extent allowed by law, employees may also elect a nontaxable transfer to such an account the total balance in a TIAA and/or CREF Supplemental Retirement Account. The BSA Plan shall offer suitable investment accounts. The rights and benefits of each participant, and the limitations (including limitations on the right to withdraw funds) shall be those set forth in the Plan within limitations prescribed by the Internal Revenue Service.

3. Contributions by Salary Deduction

The 401 (k) plan allows employees who elect to make voluntary contributions through payroll deduction to invest such funds in TIAA and/or CREF retirement annuities, in such percentages as the participant may elect, to the maximum percent permitted by the Internal Revenue Code. These percentages may be changed by the participant on a monthly basis. Contributions to TIAA/CREF retirement annuities purchased through payroll deduction will be in separate accounts from annuities purchased under the BSA Retirement Plan, and the contribution portion of any distribution will not be subject to tax when retirement income commences, subject to changes to the Internal Revenue Code.

Appendix A - Employee Benefit Plans

General

The Contractor will be reimbursed for the net allowable cost incurred in implementing, administering, and funding employee welfare plans. The features of these welfare plans are set forth in Contractor policies and Summary Plan Descriptions approved under the Contract, current copies of which will be provided to the Department of Energy. Any credits, e.g. dividends, return premiums, or other allowances and credits that accrue under each policy will be applied toward offsetting program costs. The Contractor will notify the Department of Energy prior to adding to or making a change in benefits under these plans. Any change in benefits which result in additional costs require Contracting Officer approval.

The Contractor, in compliance with DOE 0350.1, will conduct an evaluation of its benefit programs using a professionally recognized measure, either a Value Study or a U.S. Chamber of Commerce (COC) Employee Benefit Survey Comparison based on facility size and provide the results of the evaluation to DOE by September 30, 1998. The amounts of the employee contributions will be reviewed in light of the claim experience and practice prevailing among major competitive employers with respect to contributions by employees. Any proposed change in the amount of employee contribution will be submitted to the Contracting Officer for approval.

The Insurance Program is set forth in the current Certificate of Insurance (Attachment IV) and the Insurance Retirement Program Booklets (Attachment V) and the Dental Assistance Plan Document (Attachment VI) which are attached hereto and made a part hereof.

1. Group Medical Insurance Plan

The Laboratory has a Group Medical Insurance Plan which provides extensive coverage for most in- and out-of-hospital medical expenses, in accordance with the insurance policy issued by the carrier. Each participant receives a Certificate of Insurance which contains the details of the plan. Effective October 1, 1995, the Laboratory pays a portion of the cost of active employee and dependent coverage; and employees are required to contribute to the cost of such coverage.

In compliance with federal and state laws, the Laboratory also offers a number of qualified Health Maintenance Organizations (HMO) medical care plans as additional employee options to the group Medical Insurance plan. For these HMO plans, the Laboratory will pay an amount no greater than the amount it pays for the group medical plan.

a. Retired Employees and Families

All employees employed prior to January 1, 1988 are eligible for the following:

Employees retiring in the calendar year in which their 55th birthday occurs and thereafter, who have completed not less than three (3) years of service with Brookhaven National Laboratory prior to retirement, are retired employees for the purpose of continuing medical insurance coverage.

All employees employed on or after January 1, 1988 and before January 1, 2001 are eligible for the following:

A terminating employee age 55 or older, with at least five years service, must have a combination of age and years of service totaling 70 in order to receive Laboratory medical insurance coverage.

All employees employed on or after January 1, 2001 are eligible for the following:
A terminating employee age 55 or older, with at least ten years service, must have a combination of age and years of service totaling 70 in order to receive Laboratory medical insurance coverage.

Retirees otherwise eligible who are subsequently employed elsewhere will become ineligible for retiree coverage if the new employer makes available a group medical plan. Such subsequent employment will not preclude the retiree from again being eligible if he/she becomes ineligible for coverage under any other group plan.

Retired employees under 65, spouses under age 65, and dependent children continue to be covered under the Laboratory's plan on the same basis as active employees. For employees who retired between October 1, 1995, and December 31, 2001, retiree contributions will be the amount they were contributing on the day of their retirement. Should the rates for active employees' contributions change, the rates for employees who retire on or after January 1, 2002, will be adjusted accordingly.

Retired employees and their dependents eligible for Medicare benefits will be covered at no cost under the Laboratory's Medical Insurance Plan; except that payment under the plan will be reduced by the amount that employees and their dependents are reimbursed, or entitled to reimbursement, by Medicare.

The Contractor will provide experience reports and actuarial calculations estimating retiree liability, as directed by the Contractor Officer.

If the contract terminates and there is a replacement Contractor, all assets and liabilities shall transfer to the replacement Contractor, and the Contractor shall be relieved of, and held harmless by the Department of Energy, subject to the availability of appropriated funds, against any and all further liabilities arising from such plans.

If the contract terminates and there is no replacement Contractor, the Department of Energy, subject to the availability of appropriated funds, will make available to the Contractor in a timely manner sufficient funds so that the Contractor has no out-of-pocket expenditures from corporate funds to cover all liabilities incurred under this contract related to Contracting Officer-approved employee welfare benefit plans (including but not limited to Medical, Life, Dental, and Workers' Compensation). If so requested by the Department of Energy at the time of contract termination or expiration, the Contractor will continue as the sponsor of these plans until all liabilities of such plans are discharged.

b. Deceased Employees and Families

The medical insurances on the dependents of an employee who dies before the calendar year of his/her 55th birthday may be continued for a maximum of one year.

The medical insurance on dependents of an employee with three (3) years but less than fifteen (15) years service may be continued after one year, providing they pay the full group rate premium.

The medical insurance on the dependents of an employee who dies during or after the calendar year of his 58th birthday or had fifteen (15) or more years service, may be continued to the same extent that coverage would have continued had the employee retired.

Coverage in all the above situations will terminate for all dependents on the date surviving spouse remarries. This policy would not apply to a surviving spouse who is eligible for coverage by a group medical insurance plan provided by another employer.

c. Displaced Worker Health Benefits Program

The allowable costs for the DOE Displaced Worker Health Benefits Program are:

(a) First Year: The Laboratory's contribution for an active employee.

(b) Second Year: One half of the Laboratory's COBRA premium.

(c) Third and subsequent years: Reasonable administrative costs that exceed the 2 percent administrative fee paid by the displaced worker.

d. Group Medical Program Performance

The Contractor will work diligently with its insurance carriers, medical benefit providers, and employees to establish and maintain a proactive cost containment program, with the objective of providing high quality, reasonably priced benefits. The Contractor agrees to seek innovations in its program design and implementation that will result in realizing the above objective throughout the life of this contract, while also managing benefit costs so that the cost to the Government of each medical benefit program component is reasonable.

The Contractor will specifically identify program changes and cost initiatives and implement on an ongoing basis or when necessary, propose actions to the Contracting Officer that will result in actual cost savings, or which will reduce the rate of cost increases in group medical benefit programs.

2. Group Life Insurance Plan

The Laboratory shall be reimbursed for contributions to provide insurance under the Group Life Insurance Plan approved by the Contracting Officer as set forth in this Appendix.

All eligible employees are provided with a basic life insurance policy equal to approximately annual base salary. Employee contributions will not be required for basic life insurance coverage. In addition, the Laboratory makes available to those employees supplemental life insurance which, together with the basic amount, may be equal to three times annual base salary. Each employee enrolled for supplemental life insurance coverage shall contribute to the cost of such coverage. The Laboratory pays that portion of the cost of supplemental life insurance coverage not covered by employees' premiums.

Basic and supplemental insurance include accidental death or dismemberment coverage up to a maximum of $12,500 on the basic amount and $12,500 on the supplemental amount.

The cost of accidental death or dismemberment coverage is borne entirely by the Laboratory.

3. Long-Term Disability Insurance Plan

Under the Long-Term Disability (LTD) Insurance Plan, a covered employee who has been disabled for a continuous period of six months may receive 50 percent of base salary if first eligible to receive LTD benefits before January 1, 2001, or 60 percent of base salary if first eligible to receive LTD benefits on or after January 1, 2001, until normal retirement in accordance with the terms of the policy. The Laboratory pays that portion of the total cost in excess of the premium paid by the employees.

4. Group Travel Accident Insurance

The Laboratory has in force a Group Travel Accident Insurance Policy covering all employees, trustees, nonsalaried officers, guests, and all other persons with official appointments at the Laboratory who, during their stay, are authorized to travel on Laboratory business. It provides coverage equal to five (5) times annual salary, subject to a $100,000 minimum and a $500,000 maximum, and gives a full 24-hour accident coverage during business travel. No employee contributions are required for this coverage.

5. Group Dental Assistance Plan

The Laboratory has a Group Dental Assistance Plan which provides scheduled benefits for dental expenses in accordance with the Contractor's Dental Assistance Plan Document. In addition, the Laboratory may offer PPO Dental Care plans as an employee option. For these optional plans, the Laboratory will pay an amount no greater than the amount it pays for the Contractor's Dental Assistance Plan. All full-time and eligible part-time employees can elect to participate in the plan, provided they agree to have the appropriate contributions for the Dental Assistance Plan deducted from their pay.

6. Flexible Spending Plan

The Laboratory has a voluntary Flexible Spending Plan which allows eligible employees to pay for health care and dependent day care expenses on a before-tax basis. The Laboratory will allow employees to make automatic salary reduction contributions to a health care and/or dependent day care reimbursement account which they can draw against as they incur eligible expenses.

7. Long-Term Care Plan

The Laboratory offers a Long-Term Care Plan which allows eligible employees, retirees, their dependents and/or parents to pay for the costs of a prolonged, disabling illness. Each employee, retiree, dependent and/or parent enrolled for Long-Term Care coverage shall bear the full cost of such coverage.

8. Child Care

The Laboratory is authorized to operate a child development center, by subcontract or otherwise; however, the Laboratory shall not employ personnel (e.g., teachers/caregivers, etc.) under the BNL contract. Furthermore, the costs for labor, materials and supplies expended for the operation of the Child Development Center (e.g., teachers, caregivers, instructional materials and equipment) shall be fully recovered from the participants. If such a center is contracted for, the Laboratory shall require the subcontractor hold harmless the Laboratory and the Department of Energy for all liability arising out of operation of the center and shall provide adequate property damage liability and bodily injury liability insurance naming the Laboratory and DOE as additional named insured.

The Laboratory shall use its best efforts to add the Department of Energy, at no additional premium or cost, as an additional named insured under the Laboratory's existing liability policy covering the Brookhaven Child Development Center. Should the insurer be unwilling to add DOE at no additional cost, the Laboratory shall notify the Contracting Officer. The Contracting Officer shall in turn advise the Laboratory whether or not DOE desires such coverage. If desired by DOE, the costs are allowable under the Contract.

The following costs associated with implementation of a child care program are allowable:

a. Reasonable costs for communication of the program to employees.

b. Costs associated with utilities and maintenance as well as food services and medical services or supplies which are already being used in support of site operations and are readily available to additionally support child care centers.

9. Adoption Assistance

The Laboratory may reimburse employees up to $3,000 for costs associated with the adoption of an unrelated minor child. Reimbursable costs may include attorney fees, agency fees, court costs, transportation costs and medical costs.

Appendix A - Legally Required Insurance

1. Social Security

   The Laboratory deducts FICA taxes from the pay of all employees, and contributes an equal amount to the fund.

2. Unemployment Insurance

   The Laboratory provides unemployment insurance as required by law.

3. Workers' Compensation

   The Laboratory maintains insurance under the New York State Workers' Compensation law. The Contractor is required to submit a annual report to the Contracting Officer on all Workers' Compensation claims reserved at $25,000 and above and the reserves established on all new claims. In each instance, the report must include the following information: date of incident; claim number and reserve amount. In the third year of the Contract, a claims review shall be conducted by the Contractor, with a copy of the findings provided to the Contracting Officer.

4. New York State Disability Benefits

   The Laboratory maintains a qualified sick leave plan as required by the New York State Disability Benefits law.

APPENDIX A

MISCELLANEOUS PERSONNEL POLICIES

Brookhaven National Laboratory
Operated by
Brookhaven Science Associates

Appendix A - Health and Morale

1. Recreation

a. Activities

The Laboratory maintains a recreation program including athletic, cultural and social activities for employees, guests and visitors.

In the event any of the above activities of this Section are inconsistent with a final rule to be issued pursuant to Section 2192 of the Federal Acquisition Streamlining Act (Public Law 103-355), as set forth in 60 Federal Register 3314 (January 13, 1995), the parties agree to renegotiate such provisions.

b. Facilities

The recreation building, swimming pool, gymnasium, tennis courts and recreation park will be provided and maintained as recreational facilities. Other building or facilities may be made available for the recreation program when such use does not interfere with the official work of the Laboratory.

c. Group Buying

Profits from group buying services operated for the benefit of all employees may be used to assist in the support of the recreation program.

d. Income

The Laboratory shall provide the Board of Trustees of the Brookhaven Employees Recreation Association annual funds not to exceed an amount equal to $10.00 per employee for their administration of the cultural, athletic and social activities. The amount shall be determined using the total number of employees, excluding temporary employees, on the payroll as of January 1st each year.

2. Special Services

a. Billing and payroll deduction services for such things as personal telephone calls, repayment of bank loans, purchase of U.S. Savings Bonds, contributions to United Fund of Long Island, Inc., and deposits to employees' savings accounts may be provided for employees.

b. The Laboratory publishes a weekly bulletin and other periodicals.

3. Wellness Program

The Laboratory conducts a Health Promotion program whose primary objective is to reduce preventable illnesses. Examples of the program are:

a. Weight Reduction Program - Weight Watchers

b. Smoking Cessation Program - American Lung Association

c. Stress Reduction Program

d. Exercise Program

e. Nutrition Seminar

While the cost of the program is borne by the Laboratory, participants may be charged a registration fee to indicate a commitment on their part and to partially offset the total cost of the program. The Contracting Officer should be informed of significant changes to this program.

4. Employee Assistance/Substance Abuse Programs

Costs of an Employee Assistance Program and associated costs of services such as counseling referral for treatment and rehabilitation, educational services concerning illegal drug

use, or other medical, emotional or personal problems of employees are allowable. These services should be offered primarily for those problems which adversely affect worksite behavior and job performance. Services which go beyond those listed above should be coordinated with services available in benefit programs and with services available through appropriate community resources.

The Laboratory will provide the DOE with a report on the effectiveness of this program as required by the Contracting Officer.

Appendix A - Education and Training

A. General

The Laboratory shall provide training required to meet all Department of Energy, Federal, State and local regulations and compliance requirements. The Laboratory shall also provide training to ensure the qualification and competence of employees to meet mission and facilities management requirements and to develop technical and professional excellence. Laboratory training programs shall be implemented in accordance with the BNL Training Policy, which provides a systematic and orderly process consistent with Department of Energy guidance and industry practices. The Laboratory will provide the Contracting Officer information regarding the various Training Programs and the associated costs as requested.

B. Training and Development

The Laboratory may pay personnel costs and related expenses of providing training and development programs. This includes expenses for apprenticeship training, both internal and external training, designed to improve efficiency and productivity of contractor operations, to develop skills needed to do contract work, to provide career development opportunities for employees within the Laboratory organization, and to develop scientific and technical personnel in fields required for contract work.

C. Educational Assistance

Employees who successfully complete a formal college or vocational course approved by the Laboratory may be reimbursed for tuition, required textbooks and fees. Course approval shall be granted in accordance with the Laboratory's Tuition Refund Policy, which stipulates employee eligibility; that the course must be pertinent to the work that the employee is doing or may reasonably be expected to do at the Laboratory, or be required for a degree in a field of study pertinent to the work of the Laboratory; and that attendance at such courses shall not interfere with the employee's work attendance.

D. Special Formal Training Programs

The Laboratory may provide full-time specialized classroom instruction at off-site institutions in conjunction with its Craft Apprenticeship program and other approved special training programs. Participation will be limited to selected full-time employees and normally will be limited to no more than one calendar year. Eligible employees must state their intention to remain employed by the Laboratory for at least two years after completion of the training program. The trainee will be maintained as an employee for the duration of the training program and will receive his/her regular base wage or salary and all benefits for which he/she may be eligible.

E. Instructor Fees

The Laboratory may pay appropriate fees to employees who conduct classes for Laboratory-sponsored training programs after normal business hours. Such fees shall not exceed $40 per class hour of instruction. Employees whose primary responsibility involves training shall not receive this payment unless it can be demonstrated that the instruction provided is clearly outside the scope of their job duties.

F. Outreach Programs

The Laboratory may sponsor outreach programs which are designed to encourage participation in science and mathematics by youth, minorities and women. The Laboratory shall include a summary of these programs in its annual Affirmative Action Plan.

Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886

Appendix A - Awards

1. Patent Incentive Award

Awards in the amount of $250 will be made to any Laboratory employee, assigned employee, loaned employee, consultant, or other affiliate or guest of the Laboratory who is an inventor or co-inventor of a subject invention as said term is defined in the Patent Rights Article when a patent application is filed in the U. S. Patent and Trademark Office covering such invention; provided that the person has executed all documents necessary for filing such patent application in conformance with existing regulations, procedures and contracts of the Laboratory and the Department. An additional award may, with DOE approval, be awarded to each such inventor or co-inventor when a patent is granted on said patent application by the U.S. Patent and Trademark Office.

2. Other Awards

The contractor may expend an amount not to exceed 0.15% (0.0015) per year of the Laboratory's operating budget, inclusive of Work For Others, for awards without Contracting Officer approval. The types of awards may include, for example, Length of Service/Retirement Recognition; Safety Awards; Suggestion Program and Special Performance recognition.

3. Non-base Cash Compenstion

The contractor may expend non-base cash compensation amounts in payments to employees in accord with programs submitted to and approved by DOE Contracting Officer, including, but not limited to, project incentives, strategic skill stipends, and lump sum amounts in lieu of salary increases. Amounts expended under such approved programs will not be counted towards the limits for awards in section 2. DOE will be provided a listing, on an annual basis, of the programs utilized and the respective amounts expended.

Appendix A - Employee Litigation Expenses

Costs associated with the defense of claims and suits against employees, including reasonable counsel fees, judgments, court costs, and settlements, to the extent that the liability of the employee and the costs attendant thereto are not otherwise covered by insurance maintained or required to be maintained by the Contractor are allowable. The errors, omissions, or actions of the employee giving rise to such claim or suit against such employee must be within the scope of his/her employment, and cannot have been caused by or arise out of his/her lack of good faith or willful misconduct. For the purposes of this paragraph "employees" shall be deemed to include members of the Board of Governors of the BNL Clinical Research Center, members of the BNL Human Studies Review Committee, members of the Institutional Animal Care and Use Committee and volunteer professionals involved in the Marshall Islands Program. Service on such Board, Committee or Program shall be deemed to constitute "employment."

Appendix A - Distinguished Lectureship Program

The Laboratory maintains a Distinguished Lectureship Program under which distinguished scientists are invited to the Laboratory to deliver at least one lecture a week on scientific subjects related to the research program, and to be available to members of the scientific staff for discussion of such subjects.

The Distinguished Lectureship Program restricts the number of appointments to a maximum of 10 in each fiscal year. Appointments are to be made by the Director of the Laboratory only.

The Laboratory may pay each lecturer a stipend of up to $2,500 a week, not to exceed three weeks. In addition, the lecturer may be paid actual travel expenses and be given, without charge, the use of an on-site apartment.

The Laboratory shall notify the Department of Energy of each appointment to be made under the Distinguished Lectureship Program and the amount of the proposed honorarium.

Appendix A - Adjunct and Editorship Appointments

Employees of the Laboratory may be permitted to accept adjunct appointments to academic institutions and editorships of scientific, technical or other professional publications, under the following conditions:

1. An employee may not hold more than one outside appointment that provides for compensation.

2. If the appointment is simply to give formal recognition to an honorary position which requires only incidental and occasional time to be devoted by the employee either at the Laboratory or at another location, the employee may accept the appointment and receive expenses, but not compensation, while continuing to receive from the Laboratory full-time salary and benefits.

3. If the appointment requires the employee to spend not more than 10 percent of the normal working hours of the Laboratory on an appointment, both compensation and expenses may be accepted for performing such duties. The employee may use vacation time and, in addition, take leave without pay for such purposes. Under these circumstances, the employee loses no normal Laboratory benefits. Should a conflict of duties arise, the employee's primary commitment is to the Laboratory.

4. If the appointment requires the employee to spend more than 10 percent of the normal working hours of the Laboratory on the appointment, salary will be proportionately reduced for the time spent performing such duties, and the employee will be considered to be on part-time leave of absence (refer to 3-G-1). The employee may accept both compensation and expenses from the other employer. The Laboratory, however, must concur in such arrangements including the term of the appointment. Under no circumstances may the working time devoted by the employee to such projects exceed 50 percent.

Appendix A - Community Activities

The Contractor and its employees may participate in various community activities, the primary purpose of which is to foster community relations and its responsibilities as a major employer in the area. This activity includes a reasonable number of employees participating in such activities and associated reasonable and necessary expenses but excludes contributions and donations. Participation is allowable to the extent it does not adversely affect contract performance. Examples of such activities are United Way drives, blood bank drives, charity drives, savings bond drives, disaster assistance, community outreach programs, and participation in such activities as: Interface, the Long Island Association, and the Brookhaven Economic Development Commission.

Appendix A - Meal Allowance

Exempt employees who are required to work three or more hours beyond their normal scheduled workday will be eligible for a meal allowance of ten dollars ($10). This must be approved by a Department Chairman/Division Head.

Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886

Appendix A - Recruitment

Reimbursable expenses incurred in the recruitment of personnel shall include necessary and reasonable costs based on previous expense history, internal controls and the fluctuation of the level of recruitment. Expenses of recruitment may include:

1. Transportation, lodging, meals, incidental and other expenses for interviewees and, when approved by the Laboratory, on a case-by-case basis, for spouses, during their stay for the interview and in traveling to and from their home to the Laboratory location where they are interviewed, subject to the limitations under the Travel section of the Appendix.

2. Costs associated with pre-employment screening, including the costs in interviewee travel to and from their home to the Laboratory location for the purposes of medical evaluation and/or drug testing, when required, for the position being considered. Costs associated with pre-employment clearance screening for positions requiring clearance.

3. Recruitment advertising, recruitment-related employment office expenses, travel of employees on recruiting assignments, preparation of booklets, recruitment brochures and other recruitment materials not in excess of standard commercial rates.

4. Expenses related to house-hunting trips for the newly selected employees and their families, including round-trip travel and per diem. Three days may be considered reasonable and allowable. Additional time to be approved by the Manager, Personnel and Labor Relations. Travel and subsistence costs shall be reimbursed for the new hire and spouse in accordance with the Travel section of the Appendix.

5. Costs associated with a one-time sign-on cash supplement of up to $10,000 to new employees with critical and special skills who the Human Resources Division has determined are difficult to recruit. The cash supplement is intended to provide a competitive hiring package based on the Laboratory's Sign-on Supplement Program Policy. If a newly hired employee is terminated by BNL for performance or resigns for reasons under his/her control within 12 months after hire, the individual shall be required to refund or credit the cash supplement to the Laboratory for credit against its prime contract with DOE.

6. Costs associated with an Employee Referral Award Program (ERAP). The ERAP program was instituted in order to reward employees who refer successful candidates for employment. For certain specified jobs, BNL employees may recommend applicants to the HR Division and subsequently receive a monetary award if the referral is hired. An award of $1,000 will be made for referral and hire for an exempt level position; $500 for referral for a non-exempt hire. Payment will be made after the referred candidate has completed 90 days of employment. Referring employee must still be at the Laboratory to be eligible.

SALARY SCHEDULE

SCHEDULE I - MANAGEMENT SCHEDULE

MANAGEMENT

Annual Salary

Effective January 1, 2003

GRADE	Range & Growth Minimum	Competitve Minimum	Premium Minimum	Premium & Range Maximum
M-5	146,000	170,333	194,667	219,000
M-4	117,350	137,233	157,117	177,000
M-3	100,800	117,900	135,000	152,100
M-2	88,850	103,450	118,050	132,650
M-1	78,250	91,450	104,650	117,850

RA# BAO-13
Effective 1/1/03

SALARY SCHEDULE

SCHEDULE I-A - SCIENTIFIC SCHEDULE

SCIENTIFIC SALARY RANGES

Annual Salary

Effective January 1, 2003

GRADE	Range & Growth Minimum	Competitve Minimum	Premium Minimum	Premium & Range Maximum
Sr. Scientist	94,000	121,333	148,667	176,000
Scientist (w/tenure)	78,000	95,333	112,667	130,000
Scientist (w/o tenure)	78,000	95,333	112,667	130,000
Assoc. Scientist	71,000	84,000	97,000	110,000
Asst. Scientist	66,000	76,000	86,000	96,000

RA# BAO-13
Effective 1/1/03

SALARY SCHEDULE

SCHEDULE I-B - ENGINEERS/SCIENTIFIC ASSOCIATES SCHEDULE

PROFESSIONAL

Annual Salary

Effective January 1, 2003

GRADE	Range & Growth Minimum	Competitve Minimum	Premium Minimum	Premium & Range Maximum
P-10	83,500	97,400	111,300	125,200
P-9	75,000	87,300	99,600	111,900
P-8	68,000	78,467	88,933	99,400
P-7	63,950	72,450	80,950	89,450
P-5	52,600	59,583	66,567	73,550
P-3	43,600	49,433	55,267	61,100
P-1	36,100	40,917	45,733	50,550

RA# BAO-13
Effective 1/1/03

SALARY SCHEDULE

SCHEDULE I-C - ADMINISTRATIVE SCHEDULE

ADMINISTRATIVE

Annual Salary

Effective January 1, 2003

GRADE	Range & Growth Minimum	Competitve Minimum	Premium Minimum	Premium & Range Maximum
A-9	67,500	77,917	88,333	98,750
A-8	62,100	71,133	80,167	89,200
A-7	57,250	65,283	73,317	81,350
A-6	52,050	59,083	66,117	73,150
A-5	47,650	53,533	59,417	65,300
A-4	43,450	48,733	54,017	59,300
A-3	39,550	44,133	48,717	53,300
A-2	36,950	40,650	44,350	48,050
A-1	34,800	38,117	41,433	44,750

RA# BAO-13
Effective 1/1/03

SALARY SCHEDULE

SCHEDULE I-D - TECHNICAL SUPPORT/SUPERVISORY SCHEDULE

TECHNICAL

Annual Salary

Effective January 1, 2003

GRADE	Range & Growth Minimum	Competitve Minimum	Premium Minimum	Premium & Range Maximum
T-7	65,300	74,033	82,767	91,500
T-6	59,750	67,383	75,017	82,650
T-5	56,150	62,817	69,483	76,150
T-4	52,700	58,967	65,233	71,500
T-3	48,700	54,650	60,600	66,550
T-2	46,000	51,283	56,567	61,850
T-1	42,700	47,650	52,600	57,550

RA# BAO-13
Effective 1/1/03

SALARY SCHEDULE

SCHEDULE I-E - INFORMATION TECHNOLOGY SCHEDULE

Annual Salary

Effective January 1, 2003

GRADE	Range & Growth Minimum	Competitve Minimum	Premium Minimum	Premium & Range Maximum
I-12	109,050	133,267	157,483	181,700
I-11	95,500	116,717	137,933	159,150
I-10	83,750	102,350	120,950	139,550
I-9	73,650	90,017	106,383	122,750
I-8	64,900	79,317	93,733	108,150
I-7	57,450	70,233	83,017	95,800
I-6	51,150	62,517	73,883	85,250
I-5	45,700	55,833	65,967	76,100
I-4	40,800	49,867	58,933	68,000
I-3	36,550	44,683	52,817	60,950

RA# BAO-13
Effective 1/1/03

TECHNICAL WAGE

SCHEDULE II-A - TECHNICAL WAGE SCHEDULE

Weekly Rates/Annual Salary

Effective January 1, 2003

WEEKLY STEP SALARY - CY 2003

SCHEDULE	Start Step 1	3 Mos Step 2	6 Mos Step 3	12 Mos Step 4	18 Mos Step 5	24-Mo Rate	Max
TW-4	755 39,260	790 41,080	825 42,900	859 44,668	893 46,436	927 48,204	1032 53,664
TW-3	604 31,408	626 32,552	647 33,644	673 34,996	696 36,192	723 37,596	836 43,472
TW-2	524 27,248	545 28,340	564 29,328	587 30,524	608 31,616	631 32,812	708 36,816
TW-1	439 22,828	454 23,608	472 24,544	490 25,480	509 26,468	530 27,560	576 29,952

RA# BAO-13
Effective 1/1/03

CLERICAL WAGE

SCHEDULE II-B - CLERICAL WAGE SCHEDULE

Weekly Rates/Annual Salary

Effective January 1, 2003

WEEKLY STEP SALARY - CY 2003

SCHEDULE	Start Step 1	3 Mos Step 2	6 Mos Step 3	12 Mos Step 4	18 Mos Step 5	24-Mo Rate	Max
CW-3	604 31,408	626 32,552	647 33,644	673 34,996	696 36,192	723 37,596	836 43,472
CW-2	524 27,248	545 28,340	564 29,328	587 30,524	608 31,616	631 32,812	708 36,816
CW-1	439 22,828	454 23,608	472 24,544	490 25,480	509 26,468	530 27,560	576 29,952

RA# BAO-13
Effective 1/1/03

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.2

APPENDIX B

FY 2002
PERFORMANCE MEASURES AND CRITERIA

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

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Attachment 1 Critical Outcomes, Objectives, and Performance Measures
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2. Operational Excellence CO2-1
3. Leadership and Management CO3-1

Performance Evaluation System

I. Introduction

This Contract Appendix sets forth the performance evaluation system (including processes, criteria, schedules, and measures) that will be used to evaluate the overall performance of Brookhaven Science Associates (BSA) in the management and operation of Brookhaven National Laboratory (BNL) in Fiscal Year 2002 (FY02).

For FY02, in accordance with Clause H.14 of the Contract, the Parties have agreed to use a Performance-Based Management System (PBMS) that includes clear and reasonable objectives, against which BSA's overall performance will be evaluated. For this purpose, the parties have agreed to an objective hierarchy consisting of Critical Outcomes, underlying Objectives, and associated weighted Performance Measures and Metrics for the assessment of BSA's performance and the resulting determination of fee.

The DOE Office of Science (SC) identified high-level expectations in six critical activities/functional areas that SC would use to guide its regular assessment of Laboratory performance. These critical areas are Science, Environment, Safety & Health (ES&H), Infrastructure, Business Operations, Leadership, and Stakeholder Relations. SC expects SC/Headquarters (HQ) program managers, field offices, and laboratories to work in partnership to develop laboratory-specific outcomes, objectives, and measures that support these high-level expectations and to use self-assessment as a tool to achieve desired outcomes and continuous improvement.

This "Critical Outcome Process" is designed to measure overall performance and drive the improvement agenda of the Laboratory by linking Laboratory rewards, i.e., performance ratings and associated fees, to a prioritized set of objectives that have been mutually developed by the Department of Energy (DOE) and BSA. DOE and BSA have mutually agreed to the specific Critical Outcomes, Objectives, and Performance Measures contained herein, and, as described in Clause H.14 and H.13, agree to a reassessment of the process, prior to the beginning of each evaluation period.

II. Critical Outcome, Objective, and Measure Development

The following concepts are used in the development of the Performance Measures and are provided for information and clarification in the process:

1. The Critical Outcome process must be flexible to accommodate changes as planned improvements are realized and/or customer priorities vary. For example, even though the Critical Outcomes and Objectives are intended as sustainable targets over a 3-5 year and 1-3 year time frames respectively, their relative weights are expected to change more frequently. Re-prioritization of the Critical Outcomes and Objectives is a fundamental part of the annual Critical Outcome process.

2. Critical Outcomes, their underlying Objectives, and associated Performance Measures should influence the improvement agenda of the Laboratory. They should incorporate best practices and reflect the DOE and BNL functional managers' judgment as to the key performance elements for overall successful operations. Best practices should consider cost/risk/benefit effectiveness. Examples of key elements addressed are:

   Quality of product
   Timely delivery
   Cost reduction
   Cycle time reduction

User friendliness
DOE requirements

3. Performance Measures should be results-oriented and should focus on criteria that are objectively measurable and allow for meaningful trend and rate-of-change analysis where possible. They should use qualitative criteria in those cases where objective criteria will not produce meaningful evaluation results.

4. Performance Measures may reference industry business standards that are meaningful, appropriate and consistent with DOE requirements, rather than arbitrary standards. To this end, benchmarking initiatives are encouraged. Using benchmarks to change targets should consider whether it is cost effective to make further improvements or if the target level should be raised.

5. The relative weighting and metrics for each Performance Measure shall be established prior to the start of the performance period by mutual agreement of the Contractor and the DOE Contracting Officer. If the parties cannot reach agreement, the Contracting Officer shall have the right to establish such weights, subject to the provisions outlined in Clause H.13 of the Prime Contract.

6. Background and supporting information (such as purpose, means and strategies, assumptions definitions, etc.), shall be documented as appropriate.

7. Measures are to be developed in a team approach involving DOE personnel and Laboratory functional managers. Care should be taken to ensure that the resulting measures reflect performance in areas for which the Laboratory functional manager is accountable, correctly reflecting their status as responsible for the performance and desired improvement.

8. Absence of a Performance Measure does not diminish the compliance with specified contractual requirements in that area of performance. Failure to meet a significant contractual requirement may result in the Contracting Officer overriding the Performance Measures.

III. Change Control

DOE and BSA acknowledge that implementation of this performance-based contract requires both parties to continually refine selected Performance Measures and metrics, implement data collection and reporting mechanisms, and seek benchmarks against which to set appropriate targets for performance improvement and/or measurement. Continuing effort is needed to refine the system for scoring performance in each of the Critical Outcomes included in this Appendix and for integrating these scores into an overall evaluation rating for each performance period.

The process to change aspects of performance within the fiscal year, if necessary, is described in the Standards Based Management System (SBMS) Subject Area entitled, "Critical Outcome Performance Measures."

IV. Evaluation Scoring

Each Measure, Objective, and Critical Outcome is rated in accordance with the following:

OUTSTANDING	>3.5 to 4.0
EXCELLENT	>2.5 to 3.5
GOOD	>1.5 to 2.5
MARGINAL	>0.5 to 1.5
UNSATISFACTORY	$\leq$ 0 to 0.5

Once the adjectival rating is determined, the cognizant BSA manager (owner) considers other related aspects of performance (e.g., quality, efficiency, etc.) and determines an appropriate numerical rating. For example, a performance measure that met schedule quality expectations with an adjectival rating of Excellent, but an external review indicates that the work represented a "best-in-class" effort, may warrant a 3.5 rating. Similarly, a measure that met quality requirements for an excellent rating but required substantial re-work to achieve it may warrant a numerical score on the lower end of the excellent range, perhaps a 2.6.

A roll-up score is determined by multiplying the weight of each Performance Measure in that Objective by its score. These are added together to develop an overall score for each Objective, which is then translated into an adjectival rating. The process is continued for the Critical Outcomes by multiplying the scores for each Objective within a given Critical Outcome by its corresponding weight, adding the resulting numbers to get a Critical Outcome score, and converting this score to an adjectival rating as done for the Objective level. The same process is then used to calculate an overall score, and then the adjectival rating, at the Laboratory level.

V. Self-Evaluation and Improvement Agenda

BSA and DOE will conduct a mid-year review of status against performance measures contained in Attachment 1. BSA is responsible to define and coordinate the process for conducting the review and to ensure the involvement of appropriate DOE counterparts and BSA management.

On an annual basis, the Laboratory will conduct a formal Self-Evaluation of its performance relative to each Critical Outcome, Objective, and Performance Measure identified in Attachment 1 to this Appendix. This Report will also address other significant issues or opportunities that arise from the Laboratory's broader Integrated Assessment Program, whether or not they specifically impact the Critical Outcomes.

As part of the mid-year review and the annual self-evaluation process, both BSA and DOE will confirm that performance measures defined in Attachment 1 (for the current and next FY) adequately reflect the scope and priorities for Laboratory management focus.

VI. DOE Evaluation

The DOE evaluation of BSA's performance, and, in turn, the DOE determination of BSA's Fee, will be based primarily on the performance levels achieved against the weighted Performance Measures identified above. In addition, for each Critical Outcome area, the Contracting Officer may also consider any other relevant information directly or indirectly related to the Critical Outcome, including areas of performance monitoring defined by the Supporting Assessment Measures (SAMs), that is deemed to have had an impact (either positive or negative) on the Contractor's performance. The fact that a SAM is "topically aligned" under a particular Critical Outcome Area does not preclude the Contracting Officer from considering that SAM's impact upon other Critical Outcome areas. Should the Contracting Officer consider other relevant information in establishing the final performance rating for any Critical Outcome, the Contractor will receive written notice of such intent and will be given the opportunity to respond in writing. This agreement does not impact DOE's rights under Clause H.14 Paragraph (d), of the Prime Contract.

The Director of the Office of Science (SC-1) has the primary responsibility for evaluating Science and Technology performance (Critical Outcome 1), but practical input also will be sought from cognizant DOE Assistant Secretaries, Office Directors, and Program Managers. The Contracting Officer has the primary responsibility for evaluating performance relative to Critical Outcomes 2 and 3 in accordance with the Objectives, Performance Measures, and Metrics of Attachment 1. However, the Contracting Officer shall inform SC-1 of any issues or concerns that should be considered when evaluating the Contractor's performance in Critical Outcome 1. This is especially important in those areas where operational performance could have a significant impact on the Contractor's ability to conduct successful research for

the Department. The Contractor has responsibility to compile the data necessary to document its performance against all measures.

VII. Critical Outcomes, Objectives, and Performance Measures

The Laboratory's Critical Outcomes for Fiscal Year 2002 are:

Science and Technology - BNL will deliver innovative, forefront science and technology aligned with DOE strategic goals in a safe, environmentally sound, and efficient manner, and will conceive, design, construct, and operate world-class user facilities.

Environmental Restoration - BNL will deliver "Best-In-Class" solutions in conducting the Environmental Restoration Program. Focused upon completion, the results will be protective of the environment, cost effective, and performed in an open exchange with the community, our regulators, and other stakeholders. BNL will continue to keep the commitments agreed to in the Memorandum of Understanding signed by Dr. Marburger and Mr. Holland on May 4, 2001.

Management and Operations - BNL will manage and enhance operations and management processes to provide an effective and efficient work environment that enables the execution of the BNL mission in a manner responsive to customer and stakeholder expectations.

In FY02, the relative weights of the Critical Outcomes reflect a high priority on the success of the Laboratory's science and technology mission and the need for continued improvement and focus on the Laboratory's environmental cleanup activities. At the Objective level, the FY02 priorities clearly reflect an increased emphasis on BSA's self-assessment program while maintaining a balanced perspective of institutional performance consistent with SC expectations.

The Critical Outcomes, Objectives, and Measures, and their relative weights, are:

▪ **1.0 Excellence in Science & Technology**			**60%**
- Objective 1.1 Research Quality		35%	
- Objective 1.2 Relevance to DOE Missions		10%	
- Objective 1.3 Construct & Operating Facilities		30%	
- Objective 1.4 Research Program Management		25%	
▪ **2.0 Environmental Restoration**			**8%**
- Objective 2.1 Operational Excellence		60%	
Measure 2.1.1 On Time Starts of Major Projects	100%		
- Objective 2.2 Execution of Program Activities		40%	
Measure 2.2.1 Cost Performance	50%		
Measure 2.2.2 Schedule Performance	50%		
▪ **3.0 Laboratory Management and Operations**			**32%**
- Objective 3.1 Management and Business Processes		55%	
Measure 3.1.1 Assessment and Improvement	70%		
Measure 3.1.2 Business Processes	25%		
Measure 3.1.3 Workforce/Diversity	2%		
Measure 3.1.4 Corporate Involvement	3%		

- Objective 3.2 Environment, Safety and Health			15%
Measure 3.2.1	Legacy ES&H Risk Management	30%	
Measure 3.2.2	Ongoing ES&H Risk Management	70%	
- Objective 3.3 Site Infrastructure, Facilities, and Operations			10%
Measure 3.3.1	Alternative Financing for Infrastructure Projects	30%	
Measure 3.3.2	Project Management	70%	
- Objective 3.4 Information Technology			10%
Measure 3.4.1	Cyber Security	55%	
Measure 3.4.2	Scientific Computing Infrastructure	45%	
-Objective 3.5 Communications and Trust			10%
Measure 3.5.1	Building National Recognition	50%	
Measure 3.5.2	Stakeholder Involvement and Understanding	50%	

In FY02, BSA and the DOE agreed to enhance the role of the Laboratory's self-assessment process in performance-based management. To support this, in addition to defining the Critical Outcomes, Objectives and Measures, the scope of institutional level self-assessment program would also be developed in partnership and defined in this Appendix. Supporting Assessment Measures (SAMs) are identified under Objectives in this Appendix. SAMs serve to:

- Track/inform/confirm expected levels of performance (compliance, operational statistics, progress towards improvement initiatives, etc.)
- Identify vulnerabilities from sources such as previous assessment results, lessons learned (institutional and complex wide), occurrence reports, etc.

Combined, the Critical Outcomes, Objectives, Measures, and Supporting Assessment Measures, define the scope of planned institutional level self-assessment activities. This approach ensures that priorities and resources associated with institutional assessment activities supporting Critical Outcomes and Objectives are considered and balanced with the development of the specific measures and metrics contained in the Critical Outcome Trees. The SAMs are "topically aligned" with the respective objectives. However, they are not specifically used for evaluation of the objective except as noted in Section VI "DOE Evaluation." The SAMs will be considered in the evaluation of the Laboratory's self-assessment program. Substantive (as distinguished from self assessment process) - performance determined from self-assessment activities defined by SAMs may also be considered in the evaluation of the Laboratory's self-assessment program where this substantive performance provides indication of the quality of the self-assessment program.

Contractually, SAM's are defined at a fairly high level. BSA will engage DOE to ensure that DOE perspectives and direction for the assessment approach as well as benchmarks or standards of performance are considered by the Laboratory in the development and implementation of the Laboratory assessment program.

FY02 Supporting Assessment Measures include assessment activities in the following areas:

Environmental Restoration Supporting Assessment Measures (SAMs)

- Project and Program Management Systems
- Stakeholder Involvement
- Waste Management
- Work Management

Laboratory Management and Operations Supporting Assessment Measures (SAMs)

- Human Resources
- Legal services
- Property Management
- Procurement Management
- Requirements Management
- Technology Transfer
- Training and Qualifications
- Uncosted Balances
- Work-for-Others (WFO), Federal and Non-Federal

Environment, Safety, and Health Supporting Assessment Measures (SAMs)

- Environmental Compliance
- Maintain ISO 14001 Registration
- Progress Toward Accelerator Authorization Basis Upgrades
- Radiological Control
- Recycling of Solid Waste
- Regulated Waste Management
- Safety and Health
- Worker Involvement in Work Planning and Control

Infrastructure, Facilities, and Operations Supporting Assessment Measures (SAMs)

- Building Manager Program
- Safeguards and Security
- Counterintelligence
- Emergency Planning and Preparedness
- Energy Management
- Management of Maintenance Activities

Information Technology Supporting Assessment Measures (SAMs)

- Information Services
- World Wide Web

The Critical Outcomes, Objectives, Performance Measures, and Supporting Assessment Measures agreed to for FY02 through the DOE/BSA Critical Outcome process are fully defined in Attachment 1 to this Appendix.

VIII. Schedule

In order to clearly define the path forward, the following generic schedule is presented as a guide. BSA and DOE acknowledge that the nature of the processes involved demands flexibility in the schedules.

DATE	ELEMENT
March	Begin development of next FY Critical Outcomes, Objectives, and Performance Measures.
April	BNL/DOE Management retreat to assess customer strategic needs, refine next FY Critical Outcomes, Objectives, and Measures.
April	Conduct Mid-year status review for current FY cycle.

September	Approve next FY Critical Outcomes, Objectives, and Measures.
September 30	Current evaluation period ends. Incorporate next FY Appendix B into Contract.
October 30	BSA submits Annual Self-Evaluation report for previous FY to DOE.
November 15	DOE transmits draft Evaluation Report for previous FY performance to BSA.
November 30	BSA submits comments on draft report.
December 15	DOE transmits final Evaluation report for previous FY performance to BSA.

IX. Definitions and Acronyms

Activity/Functional Area - The strategic areas of mission accomplishment outlined in the Director of the Office of Science expectations for Science Laboratory's program performance in the areas of Science, Environment, Safety & Health, Infrastructure, Business Operations, or Stakeholder Relations. These form the basis for the Laboratory's Critical Outcomes, Objectives, and measures.

Critical Outcome - Performance end state having the highest level of strategic value or impact to DOE, BSA, or affected stakeholders; represent a sustainable target over a minimum of 3 to 5 years.

Critical Outcome Trees - The complete set of Critical Outcomes, Objectives, Measures, and Supporting Assessment Measures (SAM's) for a given fiscal year; Synonymous with Attachment 1 to this Appendix.

Objective - A statement of desired outcomes for an organization or activity. Objectives are intended to be sustainable targets over a 1-3 year timeframe and form a complete, non-redundant set of results for evaluating progress toward achievement of the Critical Outcomes.

Measure - A quantitative or qualitative method for characterizing performance. Performance Measures are specific to the performance period, i.e., the fiscal year, and require the development of metrics (expectation) to facilitate adjectival ratings.

Metric (a.k.a. Expectation) - The desired condition or target level of performance for each measure.

Result - The actual condition or performance level for each measure.

Supporting Assessment Measures (SAMs) - Key Institutional Level Assessment activities that support a given objective, however, are not considered necessary and/or appropriate for inclusion as specific performance measures directly connected to the Laboratory. SAMs serve to:

- Track/inform/confirm expected levels of performance (compliance, operational statistics, progress towards improvement initiatives, etc.).
- Identify vulnerabilities in response to information obtained from sources such as results of previous assessments, lessons learned (institutional and complex wide), occurrence reports, etc.

Benchmark - A standard or point of reference for measurement, usually derived from values found in other institutions or organizations.

Outstanding - Significantly exceeds the standard of performance; achieves noteworthy results.

Excellent - Exceeds the standard of performance, although there may be room for improvement in some elements. Better performance in all other elements more than offsets this.

Good - Meets the standard of performance. Deficiencies do not substantively affect performance.

Marginal - Below the standard of performance; deficiencies are serious and may affect overall results; management attention and corrective action are required.

Unsatisfactory - Significantly below the standard of performance; deficiencies are serious, may affect overall results, and urgently require senior management attention.

Critical Outcome 1.0 Basic Science & Technology

BNL WILL DELIVER INNOVATIVE, FOREFRONT SCIENCE AND TECHNOLOGY ALIGNED WITH DOE STRATEGIC GOALS IN A SAFE, ENVIRONMENTALLY SOUND, AND EFFICIENT MANNER AND WILL CONCEIVE, DESIGN, CONSTRUCT, AND OPERATE WORLD-CLASS USER FACILITIES.

The weight of this Outcome is 60% of total.

Cognizant DOE Assistant Secretaries and Office Directors have primary responsibility for evaluating the performance of Laboratory Science and Technology programs. In carrying out this responsibility, the Assistant Secretaries and Office Directors are likely to request assistance from the Program Managers under whose jurisdiction the various individual Laboratory programs fall.

In performing this evaluation, the Assistant Secretaries and Office Directors have available input from the following sources:

1. DOE Program Managers who carry out periodic reviews of the programs they fund. These reviews usually include use of independent technical experts. The Program Managers may use written reviews as a basis for evaluating the quality of the science and technology performed by the Laboratory and its relevance to their programmatic goals.

2. The Science and Technology Advisory Committee of the BSA Board that oversees the internal reviews of science and technical programs at Brookhaven. Independent review committees whose membership is drawn from the external scientific and engineering communities review each major Laboratory program on an 18-month cycle. The committees evaluate Laboratory divisions and programs with respect to the quality and performance of the staff, the quality and timeliness of the work, and the relevance of the programs to the goals of the Laboratory and sponsoring agencies. Reviews include consideration of the Performance Measures described below. The Committees' written reports and the Laboratory's responses are made available to the BSA Board for Brookhaven, DOE Contracting Officers, and to relevant DOE Program Managers.

   In addition, input from Advisory Committees reporting to the cognizant DOE Assistant Secretary or Office Director that are appointed formally through the Federal Advisory Committee Act, from reviews of relevant Laboratory activities requested for the Secretary of Energy, or from cognizant Assistant Secretaries and Office Directors may be used.

3. BNL Self-Assessments, which include Department Self-Assessments, Independent Peer Review, and Department and Lab-level Annual Self-Evaluations.

Objective 1.1 Quality of Research

The weight of this Objective is 35%.

Reviewers will evaluate the overall quality of the research performed. Depending on the nature of the program, reviewers will consider the following:

Science: Success in producing original, creative scientific output that advances fundamental science and opens important new areas of inquiry; success in achieving sustained progress and impact on the field; and recognition from the scientific community, including awards, peer-reviewed publications, citations, and invited talks.

Technology: Whether there is a solid technical base for the work; the intrinsic technical novelty of the research; the importance of technical contributions made to the scientific and engineering knowledge base underpinning the technology program; and recognition from the technical community.

Objective 1.2 Relevance to DOE Missions and National Needs

The weight of this Objective is 10%.

Reviewers will consider whether the research fits within and advances the missions of DOE; contributes to U. S. leadership in the international scientific and technical communities; contributes to the goals and objectives of the Strategic plans of DOE and other national programs; and the extent of productive interaction with other Science and Technology programs. Depending on the nature of the program, reviewers will consider the following:

Science: The program's track record of success in making scientific discoveries of technological importance to DOE missions and U.S. industry; the degree of industrial interest in follow-on development of current research results; and the effective use of national research facilities that serve the needs of a wide variety of scientific users from industry, academia, and government laboratories.

Technology: The value of successfully developing pre-commercial technology to DOE, other federal agencies, and the national economy; the program's risks and costs; and, where appropriate, the degree of industrial interest, participation, and support.

Objective 1.3 Success in Constructing and Operating Research Facilities

The weight of this Objective is 30%.

Reviewers will consider whether the construction and commissioning of new facilities is on time and within budget; whether facility performance specifications and objectives are achieved; the reliability and safety of operations; adherence to planned schedules; and the cost-effectiveness of maintenance and facility improvements.

Reviewers will also assess the quality, innovation and achievements in designing and developing new facilities that will provide the next generation of research tools.

Reviewers of user facilities will also consider whether the user access program is effective, efficient, and user-friendly; the quality of the proposal evaluation process; the strength and diversity of user participation; the productivity of the research supported, both in science and technology; and the level of satisfaction among user groups.

Reviewers will consider the extent to which BNL provides effective and efficient leadership in the development of the Spallation Neutron Source (SNS) Project. In this project, the Laboratory will perform assigned tasks and produce scheduled deliverables for the Spallation Neutron Source in accordance with the Inter-Lab Memorandum of Agreement (MOA) and the approved annual work plans. Expectations for BNL performance in this area are reflected in the following Table.

Outstanding	Deliver annual work plan elements below cost and ahead of schedule.
Excellent	Deliver annual work plan elements on cost and schedule, including up to 50% of contingency.
Good	Deliver annual work plan elements within BNL project cost and/or schedule, including greater than 50% but less than or equal to 100% of contingency.
Marginal	Delivery of annual work plan elements exceeding cost and/or schedule, including contingency, such that BNL project critical path is impacted.
Unsatisfactory	Delivery of annual work plan elements exceeding cost and/or schedule, including contingency, such that overall SNS project critical path is impacted.

Objective 1.4 Effectiveness and Efficiency of Research Program Management

The weight of this Objective is 25%.

Reviewers will consider the quality of research plans; whether technical risks are adequately considered; whether use of personnel, facilities, and equipment is optimized; success in meeting budget projections and milestones; the effectiveness of decision-making in managing and redirecting projects; success in identifying and in avoiding or overcoming technical problems; the effectiveness with which technical results are communicated to maximize the value of the research results and to gain appropriate recognition for DOE and the Laboratory; effectiveness in developing, managing, and transferring to industry intellectual property and technical know-how associated with research discoveries; and the degree to which customer and stakeholder expectations are consistently met.

Critical Outcome 2.0 Environmental Restoration

BNL WILL DELIVER "BEST-IN-CLASS" SOLUTIONS IN CONDUCTING THE ENVIRONMENTAL RESTORATION PROGRAM. FOCUSED UPON COMPLETION, THE RESULTS WILL BE PROTECTIVE OF THE ENVIRONMENT, COST EFFECTIVE, AND PERFORMED IN AN OPEN EXCHANGE WITH THE COMMUNITY, OUR REGULATORS, AND OTHER STAKEHOLDERS. BNL WILL CONTINUE TO KEEP THE COMMITMENTS AGREED TO IN THE MEMORANDUM OF UNDERSTANDING SIGNED BY DR. MARBURGER AND MR HOLLAND ON MAY 4, 2001.

The weight of this Outcome is 8% of total.

Objective 2.1 Operational Excellence in Environmental Restoration

The weight of this Objective is 60%.

BSA will incorporate operational excellence into work planning, authorization and implementation. Hazards are identified and mitigations developed during work planning. Work authorization includes levels of coordination and management review appropriate to risks and impacts. Incidents are reported promptly and timely actions are taken to resolve the problem and prevent recurrence. Trends are analyzed and feedback provided to improve performance. Management systems in use are effective tools in minimizing or avoiding events that could compromise safety or impact project costs and schedule.

Measure 2.1.1 On Time Starts of Major Projects

The weight of this Measure is 100%.

BSA will be evaluated on the quality of work planning and schedule management via the achievement of schedule start dates for major projects. The identification and start dates are mutually agreed to with BAO and are contained in Table 2.

Performance Level Metrics

Outstanding	BSA achieves all 11 Major Project Starts (MPS's); 10 no later than 2 weeks of specified start date, 1 no later than 4 weeks of specified start date.
Excellent	BSA achieves all 11 MPS's; 8 no later than 2 weeks of specified start date, 3 no later than 4 weeks of specified start date.
Good	BSA achieves all 11 MPS's no later than 4 weeks of specified start date.
Marginal	BSA achieves all 11 MPS's; 6 no later than 4 weeks of specified start date, 5 more than 4 weeks after specified start date.
Unsatisfactory	BSA does not achieve any of the 11 MPS's within 4 weeks of specified start date.

Conditions

1. The specified dates for the MPS's may be changed via DOE and BNL's formal baseline change control process. Reasons for change may include need for substantial additional characterization, substantive stakeholder concerns that affect project starts, force majeure, etc. The change control level for MPS is level 2b.
2. A Major Project Start represents a tangible field, remediation or removal activity that is significant to the customer and stakeholders. The project start represents the culmination and integration of the appropriate planning, procurement, resources, documents and reviews. It is recognizable and auditable in the field. Once started, the project will continue to make substantive progress through an on-schedule completion.

3. BSA will reevaluate the path forward and baseline for the BGRR and present their recommendations by February 15, 2002 including preliminary dates for the BGRR MPSs denoted TBD and new IAG milestones/schedules. Changes to all BGRR schedules and milestones resulting from this effort will be implemented through change control. The final version of these BCPs will be submitted to DOE by April 15, 2002

Objective 2.2 Execution of Program Activities

The weight of this Objective is 40%.

BSA will expertly, expeditiously, and economically plan, conduct, and complete decontamination and decommissioning of surplus facilities; removal and disposal of wastes; and remediation of soils and groundwater contaminated by past practices. These projects will be safely but aggressively undertaken, closely controlled, and focused on completion. BSA will aggressively manage cost and schedule performance within acceptable performance measures and achieve all major Interagency Agreement milestones on or before their commitment date with the regulatory agencies.

Measure 2.2.1 Cost Performance

The weight of this Measure is 50%.

BSA will be evaluated on its cost effective performance management of the baseline for FY 2002.

Cost Performance Index = (Budgeted Cost of Work Performed)/(Actual Cost of Work Performed)

Performance Level Metrics

Outstanding	CPI $\geq$ 1.020
Excellent	0.980 < CPI 1.020
Good	0.950 < CPI $\leq$ 0.980
Marginal	0.900 < CPI $\leq$ 0.950
Unsatisfactory	CPI $\leq$ 0.900

Conditions:

1.) Because of the uncertainties associated with the project scope, the above metric does not include the BGRR. However, the Project to Date Cost Variance (BCWP-ACWP)/BCWP * 100%) at the end of FY 2002 for the BGRR must be greater than – 20 percent for the BGRR as verified by BAO.
2.) BCWP from BCPs processed for activities performed and costed in prior years (i.e. pre-2002) is excluded from the calculation. This information will be included in the BCPs.

Measure 2.2.2 Schedule Performance

The weight of this Measure is 50%.

BSA will meet and accelerate all primary, secondary and removal action milestones scheduled under the Interagency Agreement (IAG) as agreed upon with the U.S. EPA and NYSDEC and all Level 1, 2A, and 2B Milestones. Additionally, BSA will accelerate out-year milestones to demonstrate superior schedule performance. These are listed in Table 1.

Performance Level Metrics

Outstanding	All FY02 Milestones described above are met on schedule. In addition, 3 or more of the FY03/FY04 Acceleration milestones are completed by September 30, 2002.
Excellent	All FY02 Milestones described above are met on schedule. In addition, 2 of the FY03/FY04 Acceleration Milestones are completed by September 30, 2002.
Good	BSA completes all FY02 milestones described above on schedule.
Marginal	BSA misses one FY02 milestone.
Unsatisfactory	BSA misses two or more FY02 milestones.

Assumptions

1. No IAG milestones dates agreed upon with the Regulators may be missed. However, IAG milestone dates are subject to change through IAG Milestone Extension requests.
2. Level 1 and 2 milestones are subject to change through baseline change control.
3. Accelerated FY03/FY04 milestones may be substituted for missed FY02 milestones in a two for one ratio.
4. BNL must continue to make good progress towards IAG and level 1 and 2 milestones that occur in FY 2003 during FY 2002. FY 2002 performance cannot result in missing FY 2003 milestones.

Environmental Restoration Supporting Assessment Measures (SAMs)

Project and Program Management Systems: BSA will assess its implementation of project management systems in accordance with DOE requirements and industry standards including progress on implementing its Re-Engineering agenda through FY 2002; DOE Order 413 compliance; earned value and project reporting; and baseline change and maintenance. Both DOE and BSA will continue the assessment reviews initiated in FY01. BSA action will be taken to improve performance in this area as part of its Re-Engineering agenda.

Stakeholder Involvement: BSA will assess the condition and success of stakeholder and regulatory relations for the EM program. This assessment will evaluate the quality, timeliness and effectiveness of interactions with regulators and other stakeholders; interface and coordination with Community Education Government and Public Affairs (CEGPA) and DOE; communication, outreach and regulatory planning; development of materials (including supporting documents, fact sheets and other communication items, and regulatory reports such as EE/CA's, etc.); and, execution. BSA management action will be taken as necessary to improve performance in this area.

Waste Management: BSA will assess its progress in implementing an integrated and cost effective waste management for its EM program. The focus in FY 2002 will be to identify and take the necessary actions to minimize non-conforming waste shipments; identify and implement cost effective waste transportation and disposal mechanisms; and the reduction of waste inventories at the BGRR. BSA management action will be taken as necessary to improve performance in this area.

Work Management: BSA will assess the implementation of ISM practices within the planning and execution of environmental restoration and decontamination and decommissioning fieldwork and waste management operations. The focus in FY 2002 will be implementation of work planning processes, minimization of radiological contamination events, and incorporation of lessons learned. BSA management action will be taken as necessary to improve performance in this area.

Table 1 FY03 / FY04 Acceleration Milestones

1. Submit HWMF Soil Draft RA Work Plan to EPA/DEC –March 7, 2003
2. Submit Magothy Summary Report to BNL/DOE-Oct 15, 2002
3. Submit Magothy Characterization Report to EPA/DEC –Dec 16, 2002
4. Submit Airport System RA Work Plan to EPA/DEC –Oct 29, 2002
5. Submit Industrial Park East RA Work Plan to EPA/DEC –Dec 20, 2002
6. Submit North Street RA Work Plan to EPA/DEC – Dec 12, 2002
7. Submit LIPA System RA Work Plan to EPA/DEC – June 12, 2003
8. Submit OU IV Deletion Report to DOE – Oct 24, 2002
9. Submit OU IV Deletion Report to EPA/DEC Feb 6, 2003
10. Submit OU VI Remediation System RA WP to EPA/DEC – Oct 10, 2002
11. Submit UGP Draft Completion Report to Regs for R&C –Nov 20, 2002
12. Submit Draft Chem Holes C/O Rept to EPA/DEC – April 8, 2004
13. Submit Ash Pit RD/RA Work Plan to EPA/DEC – Nov 3, 2003
14. Submit Draft Ash Pit C/O Rept to EPA/DEC - Jun 4, 2004
15. Submit Meadow Marsh Work Plans to EPA/DEC – Dec 01, 2003
16. Submit Meadow Marsh Closeout Rept to EPA/DEC – Jun 21, 2004
17. Submit Sr-90 90% design to EPA/DEC – May 6, 2004
18. Submit Sr-90 RA Work Plan to EPA/DEC – July 19, 2004
19. Submit STP Closeout Rept to EPA/DEC – Feb 25, 2003
20. Complete Disposal of EM Liability Waste – Sept 30, 2004

Table 2 FY02 Major Project Starts

DESCRIPTION - DATE	COMPLETION CRITERIA	BASELINE ACTIVITY ID & DESCRIPTION
1) 701/702 and Remaining Soils Characterization Field Work Start - 17 Jun 02	The Blue Book is complete (Technical Work Document, Radiation Work Permits, Digging Permits, Confined Space Permits, Job Safety Analysis), the SAP has been submitted to DOE, and the Readiness Review has been completed.	BGBPO3 – 701/702 and Remaining Soils Characterization.
2) Bldg 650 S/O Mobilization – 10/22/01	Kick-off meeting held, contractor(s) issued Notice to Proceed for clearing and grubbing, supplemental investigation and overburden removal, contractor onsite mobilizing equipment.	010495A - Bldg. 650 Mobilization
3) Mobilize and Sort Stockpile 7 –7/3/02	Kick-off meeting held, contractor(s) issued Notice to Proceed, contractor on-site mobilizing equipment.	011048 – Mobilize and Sort SP 7
4) Mobilize and Sort Stockpile 4 and 15 – 8/1/02	Kick-off meeting held, contractor(s) issued Notice to Proceed, contractor on-site mobilizing equipment.	010987A30 – Mobilization/Sorting SP 4-15
5) Construct Permanent Sediment Trap – 2/4/02	Staging area is laid out, upstream debris cleared, DEC equivalency permit issued and all physical work prerequisites complete. Rip rap material is staged adjacent to river bed and placement of geotextile material on the river bed has been initiated.	050670DE – Install Silt Trap
6) Initiate Remediation of STP Beds and Berms – 6/18/02	Contractor issued Notice to Proceed, contractor mobilized, remediation area Surveyed and delineated for contamination extent removal, excavation of soil has been initiated.	050454H – Remediate STP Berms
7) Middle Road Remediation System Start-Up – 11/08/01	The system is complete, specifically all major components are operational. The Operational Readiness Evaluation has been completed and any items identified as pre-start items in the ORE are completed.	Related To 03 M0550 – Prepare Startup Report Middle Road
8) Construction of Western South Boundary System – 10/1/01	The remedial Action Work Plan has been submitted, notice to proceed has been issued to the contractor, kickoff meeting held, contractor is mobilized	03WS145 – Construction SWB
9) Construction of Sr-90 Pilot System – 5/15/02	Kick-off meeting held, contractor(s) issued Notice to Proceed, contractor on job site	03S9030 – Construct Sr-90 Pilot System
10) Start Loading Stockpiles 6A and 7 - 9/10/02	Work Planning Documents Completed: contracts awarded and loading initiated into railcars for disposal at Envirocare.	O11012 & O10993
11) Underground Cooler Removal – 11/30/01	Readiness review document completed (includes technical work documents, RWPs work permits, JSAs) and closure of any open items identified during the review. Physical work has been initiated.	BGBG0081 – Remove Coils (Remove & Fix cut & Plug)

Critical Outcome 3.0 Laboratory Management and Operations

BNL WILL MANAGE AND ENHANCE OPERATIONS AND MANAGEMENT PROCESSES TO PROVIDE AN EFFECTIVE AND EFFICIENT WORK ENVIRONMENT THAT ENABLES THE EXECUTION OF THE BNL MISSION IN A MANNER RESPONSIVE TO CUSTOMER AND STAKEHOLDER EXPECTATIONS.

The weight of this Outcome is 32% of total.

Objective 3.1 Management and Business Processes

The weight of this Objective is 55% of total.

BSA will develop, implement, evaluate, and improve management tools and processes to attract, hire and retain a highly qualified and diverse workforce and enable the workforce to effectively and efficiently support the Laboratory scientific and cleanup missions.

Measure 3.1.1 Assessment and Improvement

The weight of this Measure is 70%.

3.1.1.1 Overall Evaluation of the Laboratory Self-Assessment Program

The weight of this Measure is 90%.

Purpose and Supporting Information

BSA is committed to rigorous and candid self-assessment in order to monitor performance and promote early identification and resolution of issues that may impact achievement of the Laboratory's organizational performance objectives. In FY02, BSA and the DOE agreed to enhance the role of the Laboratory's self-assessment process in performance-based management.

BSA will coordinate and conduct an overall evaluation of the Laboratory's Assessment Program. The evaluation team will include DOE representatives (BAO and others selected by BAO), BSA Representatives and "peer reviewers" from other Laboratories.

The evaluation will consider the "approach/definition, deployment/implementation, and improvement/ results" of Laboratory assessment processes which include Line management (organizational assessments), management system (programmatic assessments), and independent assessments (which can either look at programmatic or organizational performance). Substantive (as distinguished from self assessment process) performance determined from self-assessment activities defined by SAMs may also be considered in the evaluation of the Laboratory's self-assessment program where this substantive performance provides indication of the quality of the self-assessment program. *Note: Independent assessments are considered to be those assessment activities managed by the BSA Internal Audit and Independent Oversight organizations.*

Note: A process/protocol for conducting the evaluation of the self-assessment program including criteria for determining the performance rating will be developed by BSA and DOE/BAO by 3/31/02. Upon completion, the process will be included in Appendix B either directly or by reference.

Performance Level Metrics

As determined by the evaluation process/protocol.

3.1.1.2 Enhance Evaluation of Management Systems

The weight of this measure is 10%.

Purpose and Supporting Information

Verification of the Quality Assurance Program (QAP) was planned for FY01. One of the strategies used in the development of the evaluation approach was to develop a process that could be used as a tool in the continuous improvement process of other Laboratory management systems. The verification process was designed to initially evaluate the maturity of the eight management systems/processes that support the QAP. The Verification was not completed in FY01. However, the work done to develop an evaluation method for management systems has been fruitful in that this method will be evaluated for incorporation into the Laboratory Assessment Program.

The FY02 measure will focus on performing evaluations on the five remaining management systems and generating a summary report of all eight management system evaluations and the state of the BNL QAP. In addition, the management system evaluation process will be refined based on the experience gained through the QAP Verification. The remaining five management systems include:

- Integrated Assessment Program
- Training & Qualifications Management System
- Records Management System
- Quality Management System
- Human Resources Management System – R2A2 Process

A Management System Evaluation consists of the following:

- Establishment of an evaluation team.
- Development of an Information Package about the performance and operation of the management system

- Conducting an Evaluation Workshop to score the maturity of the MS.
- Generation of a report documenting the evaluation process and results.

A single MS evaluation is complete once the final report of that evaluation is issued.

Performance Level Metrics

Outstanding	All 5 remaining MS evaluations are complete and the Summary Report on the QAP Verification is issued.
Excellent	4 MS evaluations are complete.
Good	3 MS evaluations are complete.
Marginal	2 MS evaluations are complete.
Unsatisfactory	Less than 2 MS evaluations are complete.

Measure 3.1.2 Business Processes

The weight of this measure is 25%.

3.1.2.1 Baseline Study of Laboratory Business Systems

The weight of this measure is 50%.

Purpose and Background

BSA seeks to continuously improve the effectiveness and efficiency of the Laboratory's business processes. Over the past several years, improvements have been made to the business management tools and infrastructure (i.e., Peoplesoft, etc.). A natural progression, following these investments, is the identification of key operational measures and indicators that can be used to monitor and evaluate performance of these systems. This measure is focused on an effort to baseline/benchmark management processes and systems to identify the set of indicators that collectively can be used to evaluate the ongoing effectiveness and efficiency of the Laboratory business related management systems.

Measure

BNL and DOE/BAO will partner to perform a baseline study that identifies those Management Systems that can be effectively compared.

Performance Level Metrics

Outstanding	Study partially implemented.
Excellent	Study completed with specific indicators identified.
Good	Study is scoped.
Marginal	Study is not scoped.
Unsatisfactory	No progress.

3.1.2.2 Work-for-Others (WFO) Business Systems

The weight of this measure is 50%.

Purpose and Background

Approximately 20 percent of Laboratory research funding comes from Work for Others (WFO), with well over half related to non-DOE research interests (NIH, NASA, etc.). Assessment activities have indicated the need to enhance the WFO business and information management processes, primarily associated with the billing system. These measures are focused on improving the billing system and the development of a database that will be shared between the DOE/BAO and the Laboratory in accordance with the Office of Science's 2001 Report and in accordance with BNL's FY 2001 Self-Evaluation of WFO-Federal. This database will aid in ensuring that information used in the billing process essential to both the Laboratory and DOE are accurate and current.

3.1.2.2.1 Improve WFO Billing System

Performance Level Metrics

Outstanding	WFO Billing System owned and operated by BNL.
Excellent	WFO Billing System has improved but short of full BNL ownership.
Good	WFO Billing System reconciles satisfactorily monthly.
Marginal	WFO Billing System continues to experience missing data and incomplete information.
Unsatisfactory	WFO Billing System had material errors.

3.1.2.2.2 Develop WFO Database

Performance Level Metrics

Outstanding	Shared database is completely operational.
Excellent	Shared database plan completed.
Good	Shared database scoped.
Marginal	Shared database is not fully scoped.
Unsatisfactory	No progress in planning of a shared database.

Measure 3.1.3 Workforce/Diversity

The weight of this measure is 2%.

Purpose and Supporting Information

As a Federal Contractor, the Laboratory has the responsibility to take affirmative action to recruit diverse people--women, minorities and people with disabilities. Special efforts should be taken to diversify higher-level positions such as in the Official and Managers and Professional job categories, which have been identified as underutilized.

Annually, Human Resources and the Diversity Office develop a recruitment program targeting underrepresented people. Of particular interest for BSA is to improve the representation in managerial and professional positions. Internally, one-on-one meetings with management, as well as meetings with Laboratory Committees and training classes for managers, are conducted to increase the awareness of the manager's responsibility for affirmative action.

To support these efforts, the Laboratory provides funds to the Diversity Office. The Diversity Initiative, Professional Associates Program, Science and Engineering, and similar programs offer complimentary funding to departments for recruiting and hiring underrepresented people.

This measure serves to ensure these initiatives are effective in ensuring the availability of viable diversity candidates in the pool of individuals applying for managerial and professional positions.

Measure

Percentage improvement from average of 1998 and 1999 position openings in "Officials & Managers" and "Professionals" for which at least one viable diversity candidate was included in the applicant pool

Performance Level Metrics

Outstanding	10% or more improvement.
Excellent	5% - 9.9% improvement.
Good	Maintain current level + or – 4.9%.
Marginal	5% - 9.9% decline.
Unsatisfactory	10% or more decline.

Measure 3.1.4 Corporate Involvement

The weight of this measure is 3%.

Purpose and Supporting Information

Brookhaven Science Associates believes that active corporate involvement is a critical success factor in the management of BNL. To implement this, BSA is committed to the following types of activities at BNL:

- Providing highly skilled candidates for senior management positions at the Laboratory.
- Providing proven management systems and processes for enhancing business operations.
- Facilitating the implementation of these with long-term assignments of key leaders and short-term assignments of subject matter experts.
- Conducting management assessments in various areas of Laboratory operations.
- Providing strategic guidance to the science, technology and cleanup missions of the Laboratory.
- Facilitating the exchange of ideas and practices between other organizations affiliated with BSA corporate partners that bring benefits to DOE and/or BNL.

Metrics

Performance relative to each item will be determined as acceptable or unacceptable. Performance related to the measure, as a whole, will be determined as follows:

Outstanding	All 6 items determined acceptable.
Excellent	5 of the 6 items determined acceptable.
Good	4 of the 6 items determined acceptable.
Marginal	3 of the 6 items determined acceptable.
Unsatisfactory	2 or less of the 6 items determined acceptable.

Laboratory Management and Operations Supporting Assessment Measures (SAMs)

Combined with the specific performance measures discussed above, these activities define the scope of planned institutional level assessments that support BSA's Management and Business Processes Objective. Performance relative to these assessments is considered in the evaluation of the Laboratory's self-assessment program addressed under Measure 3.1.1.1, Assessment and Improvement.

Human Resources: BSA will conduct assessments of the benefits and compensation programs to ensure consistency with appropriate benchmarks and best practices to enable attracting and retaining a world-class research staff and highly competent support staff.

Legal services: BSA will consider the following indicators to evaluate the effectiveness and efficiency of Legal services:

- Innovative improvements to Laboratory's Legal Services.
- Timeliness and quality of work products submitted for DOE approval and use are supported by timely, sound, and thoroughly researched legal advice.
- Thoughtful consideration of alternative dispute resolution (ADR).
- Compliance with DOE approved legal management procedures.

Note: specific measures and expectations associated with the Legal Service SAM will be provided to the Laboratory in writing by the Contracting Officer (CO)

Property Management: BNL will conduct a comprehensive review of the Laboratory's property management processes used for control and accountability of the Government's assets. A Balanced Scorecard (BSC) plan will be used as the primary self-evaluation tool.

Procurement Management: BNL will conduct a comprehensive review of the control and accountability of the Laboratory's procurement business processes. A Balanced Scorecard (BSC) plan will be used as the primary self-evaluation tool.

Requirements Management: A cornerstone of SBMS is the requirements management process, which systematically links external regulatory requirements to internal management processes and procedures. BSA will conduct an assessment to determine the effectiveness of this process.

Technology Transfer BSA will consider the following information to evaluate the effectiveness of Technology Transfer processes:

Agreements: Level of customer satisfaction as derived from annual CRADA and Non-Federal WFO customer satisfaction surveys.

Intellectual Property: (1) Level of patent licensing activity as measured by the amount of licensing related revenue received by the Laboratory and the quality of BSA patent properties as measured by the percentage of patent properties that have been licensed; (2) Utilization of appropriate mechanisms to protect Laboratory-generated data and degree of interaction with DOE Patent Counsel regarding Intellectual Property data rights issues.

Training and Qualifications: BSA will use the following indicators to monitor the status of satisfying training and qualification requirements for Laboratory employees and transient staff. Management action will be taken to address significant deviations from expected performance trends:

- % of individuals linked to job-specific training assessments.
- % of training and qualification requirements completed by staff.

Uncosted Balances: BSA will monitor the percentage of uncosted operating balances of SC and EM funding (approximately 85 percent of DOE funding for BNL) to operating funds received in the financial plan. Management action will be taken to ensure uncosted operating balances are maintained at levels needed to ensure continuity of operations (expected target <10%).

Work-for-Others (WFO), Federal and Non-Federal: BNL will evaluate WFO customer satisfaction and proposal processing cycle time. The March 16, 2001, Office of Science Review will be used as guide for this evaluation. Additionally, BSA will monitor progress towards the preparation of a document that summarizes all of the requirements of the WFO Program including Federal programs.

Objective 3.2 Environment, Safety, and Health

BNL will develop, implement, and continuously improve management systems, processes, and services to effectively and efficiently manage environment, safety, and health risks associated with the legacy vulnerabilities and work associated with support of ongoing Laboratory mission activities.

The weight of this Objective is 15%.

Measure 3.2.1 Legacy ES&H Risk Management
The weight of this measure is 30%.

3.2.1.1 Site Hazard Footprint Management

The weight of this measure is 50%.

Purpose and Supporting Information

Long-term legacy ES&H risk management requires assurance that site hazards are primarily associated with on-going mission or mission support activities. Site hazards that are not associated with on-going work can present significant legacy vulnerabilities. They also present inefficiencies because the resources and attention required to effectively manage the hazards detract from work that is clearly connected to the Laboratory mission.

This measure is intended to begin establishing a "hazard footprint" for conditions that are not directly related to achieving the Laboratory mission and have not been transitioned to EM for disposition/ resolution. In the context of this measure, a "footprint" is defined as records in the form of drawings, databases, and other documents, which collectively define the scope of hazard sufficient to enable effective management (i.e., location, source term, volume, etc.) and definition of areas regarding future decommissioning needs. The focus will be on establishing the footprint for radiological hazards.

Non-mission related radiological hazards will be identified through field walk-throughs; interviews with current and former employees; document review and limited characterization surveys; and identified on-site plans as appropriate. Buildings will be prioritized based on knowledge and experience of the BNL Radiological Controls Division. The following buildings are scheduled to be base-lined in FY02:

- 490 Medical
- 463 Biology
- 801 EENS/Medical
- AGS Lead Yard
- AGS Steel Yard
- AGS Block Yard
- Greenhouses
- Large Animal Facilities
- 830 EENS
- 555 Chemistry
- 462 Hot Shop

Once the footprint is established, management processes can be developed and action can be taken to address specific issues. This initiative is a natural continuation of the facility review project because it develops and implements management processes designed to aid in the prevention of the need for any such site-wide initiative in the future.

Measure

Baseline Radiological Footprint

Performance Level Metrics

Outstanding	footprint established for >= 90 % of priority buildings
Excellent	footprint established for 80-89% of priority buildings
Good	footprint established for 60-79% of priority buildings
Marginal	footprint established for 40-59% of priority buildings
Unsatisfactory	footprint established for < 40% of priority buildings

3.2.1.2Chemical Disposition Upon Employee Termination

The weight of this measure is 50%.

Purpose and Supporting Information

Proper and timely disposition of the chemicals when employees are terminated minimizes the potential for generation of future legacy risks. Laboratory termination processes contain checks to ensure transfer of responsibilities for the management of chemicals when employees are terminated. This measure is focused on evaluating the adequacy and effectiveness of those processes.

The following approach will be used:

- Measure the percentage of terminated staff with 100% disposition of assigned chemical containers within one month of termination date.
- All terminations that occurred within the previous12 months will be evaluated.

Performance Level Metrics

	Score
Outstanding	>90 % of terminated staff with all chemicals dispositioned
Excellent	80 – 90 % of terminated staff with all chemicals dispositioned
Good	70 – 79.9 % of terminated staff with all chemicals dispositioned
Marginal	60 – 69.9 % of terminated staff with all chemicals dispositioned
Unsatisfactory	<60 % of terminated staff with all chemicals dispositioned

Measure 3.2.2 On-going ES&H Risk Management

The weight of this Measure is 70%.

3.2.2.1 Pollution Prevention

The weight of this Measure is 20%.

Purpose and Supporting Information

Investment in pollution prevention can help BSA save money, create a safer workplace, and help protect the environment at the same time. The Laboratory's Pollution Prevention (P2) is focused on incorporating P2 into work planning (facility design, experimental review, process assessment, and work planning).

Proposals for funding pollution prevention opportunities are submitted to the Laboratory Pollution Prevention Council based on several factors, including funding availability, return on investment, and achieving goals associated with specific waste streams. Project plans are developed to an appropriate level based on complexity for funded P2 projects.

This measure focuses on driving site-wide involvement in the Pollution Prevention Program. It will help develop a rich database of pollution prevention opportunities so when funding becomes available we are prepared to take advantage of the opportunity. It enhances the communication of best practices and lessons learned. Additionally, having clear evidence of site-wide management commitment to, and, implementation of, Pollution Prevention initiatives, helps the Laboratory to be recognized as leaders in the DOE community and improves our chances of obtaining additional pollution prevention funds.

Measure

Each organizational unit must demonstrate active involvement in the BNL Pollution Prevention Program. For the listed organizational units (see list below), "Demonstrating involvement" is evidenced by submitting at least two pollution prevention project proposals to the P2 Council and/or two success stories and/or lessons learned stories. Other organizational units not specifically listed shall demonstrate involvement by establishing a pollution prevention objective in their organization's EMS Program.

List of organizations that must submit P2 Proposals and success stories/lessons learned:

Basic Energy Sciences Directorate
EENS Directorate
Environmental Management Directorate
Facilities and Operations Directorate
Finance and Administration Directorate
High Energy & Nuclear Physics Directorate
Life Sciences Directorate

Performance Level Metrics

Outstanding	90% of organizational units demonstrated involvement in the P2 Program.
Excellent	80-89% of organizational units demonstrated involvement in the P2 Program.
Good	70-79% of organizational units demonstrated involvement in the P2 Program.
Marginal	60-69% of organizational units demonstrated involvement in the P2 Program.
Unsatisfactory	50-59% of organizational units demonstrated involvement in the P2 Program.

3.2.2.2 Transportation Safety Implementation

The weight of the Measure is 30%.

Purpose and Supporting Information

In FY00, BAO performed an assessment of the Laboratory's Radioactive Material Transportation Safety Program. The assessment indicated substantial regulatory vulnerabilities associated with transportation safety of radioactive and hazardous materials, particularly with transportation of those materials on site. Additionally, there were several occurrence reports related to transportation issues at BNL.

BSA responded by developing a Transportation Safety Re-engineering Project Plan. The project was focused on defining the Laboratory program. It was completed in FY01 and an implementation plan was developed. To ensure the program is effectively deployed and implemented, focus needs to continue through FY02. The purpose of this measure is to satisfactorily complete key milestones associated with field deployment/implementation which are scheduled for FY02, and prepare the Laboratory for a DOE independent assessment of the Transportation Safety Program required by DOE Order 460.2.

3.2.2.2.1 Complete the Following Milestones

The weight of this measure is 50%

- Develop and implement hazardous material training for Contractor Vendor Orientation, General Employee Training and General Awareness Training by 11/30/01.
- Complete development of a "Hazardous Material Transportation" web site to facilitate communication of hazmat requirements to the staff by 1/30/02.
- Identify personnel who need the general awareness training and train them, and modify their Job Training Assessments (JTA's) as appropriate by 3/30/02.

- Identify, prioritize, and schedule Safety Assessment Methodologies (SAMs) needed throughout the departments/divisions to cover current transportation activities by 3/30/02.

Performance Level Metrics

Outstanding	4 of 4 completed ahead of schedule.
Excellent	3 of 4 completed within 30 days of scheduled due date.
Good	2 of 4 completed within 30 days of scheduled due date.
Marginal	1 of 4 completed within 30 days of scheduled due date.
Unsatisfactory	None completed within 30 days of scheduled due date.

3.2.2.2.2 Develop Safety Assessment Methodologies (SAM's) Schedule for FY02
The weight of this measure is 50%

Performance Level Metrics

Outstanding	100% of SAM's completed ahead of schedule.
Excellent	90-99% of SAM's completed in accordance with the HMTM within 14 days of scheduled due date.
Good	80-89% of SAM's completed in accordance with the HMTMwithin 14 days of scheduled due date.
Marginal	70-79% of SAM's completed in accordance with the HMTMwithin 14 days of scheduled due date.
Unsatisfactory	<70% of SAM's completed in accordance with the HMTMwithin 14 days of scheduled due date.

3.2.2.3 OSHA Reportable Injury Management

The weight of this measure is 30%.

Purpose and Supporting Information

BNL seeks to achieve excellence in worker safety and health protection through its Integrated Safety Management Program. Although a lagging indicator of performance, the frequency and severity of worker injuries provide management information regarding the effectiveness of the Laboratory's Integrated Safety Management System. BNL will seek to improve the following reportable rates:

Total Recordable Case Rate (OSHA Recordables) TRCR
Lost Workday Case Rate (LWCR)
Lost Work Day Rate (LWDR)

Where:

$$\text{TRCR per 100 FTEs} = \frac{\text{Number of OSHA reportable injuries/illnesses} \times 200{,}000}{\text{Total Hours Worked}}$$

$$\text{LWCR per 100 FTEs} = \frac{\text{Number of Lost Workday Cases} \times 200{,}000}{\text{Total Hours Worked}}$$

$$\text{LWDR per 100 FTEs} = \frac{\text{Number of Days Away From Work+Restricted Days} \times 200{,}000}{\text{Total Hours Worked}}$$

The following Table reflects expectations in these areas. The metrics used for this performance measure are derived from the DOE 5-year averages published on *CAIRS Table S3, Injury and Illness Ranking of Research Contractors.* The metric compares the most recent complete BNL calendar year data to the DOE 5-year Research Averages on the same S3 Table (e.g., for 2001, 1996 through 2000).

Table 1

Metric/Weight	Outstanding	Excellent	Good	Marginal	Unsatisfactory
TRCR/0.33 **LWDR/0.33** **LWCR/0.33**	<30%	<15% to 30%	+/-15% of Mean	>15% to 30%	>30%

Table 2

Score	Performance for TRCR, LWCR & LWDR
4	<30% of Mean
3	<15% to 30%
2	+/- 15%
1	>15% to 30%
0	>30%

Composite Score = TRCR score x .33 + LWDR score x.33 + LWCR score x .33

Table 3

Rating Level	Composite Score Based on Table 2
Outstanding	3.5 – 4.0
Excellent	2.5 – 3.49
Good	1.5 – 2.49
Marginal	0.5 – 1.49
Unsatisfactory	<0.5

3.2.2.4 Chemical Safety Performance

The weight of this measure is 20%.

Internal and external assessment activities have indicated the need for the Laboratory to continue focusing on chemical management operational performance. Laboratory requirements, processes and tools are intended to ensure clear accountability and control of chemical inventories. This measure is intended to evaluate the effectiveness of those processes and tools in managing chemical risks.

3.2.2.4.1 Chemical Inventories and Accountabilities

BNL will seek to ensure that chemical containers are properly inventoried. The following approach will be used:

- Survey all containers in seven rooms - (Use lottery to select departments/divisions/rooms). Note: The definition of "container" and "room" are consistent with 29 CFR 1910.1200. No more than one test per organization.

- Survey will be limited to rooms with more than 50 chemical containers. If the room contains more than 400 containers, the room will count as two rooms.

- BNL and BAO will jointly participate in the compilation and evaluation of this data.
- The field verification will be unannounced.

The following Table reflects expectation in this area where the composite score is determined by 70% of the percentage of containers with barcodes plus 30% of the percentage of bar coded containers assigned to the correct owners (current staff or visitors at the time of field verification). The following equation will be used to determine the composite score:

$$[\sum_{i=1}^{n}((0.7)(C_{Bi})+(0.3)(C_{Oi}))]/n$$

C_{Bi}= % of containers with barcodes for the i_{th} room.
C_{Oi}=% of containers for the i_{th} room assigned to correct owners
n= # of rooms

Performance Level Metrics

	Composite Score
Outstanding	>90 %
Excellent	80 – 90 %
Good	70 – 79.9 %
Marginal	60 – 69.9 %
Unsatisfactory	<60 %

3.2.2.4.2 Peroxide Forming Compounds

The potential for peroxide forming compounds in Laboratory chemicals presents particular risks for the Laboratory environment. This measure is intended to ensure that peroxide forming chemicals are being managed in accordance with Laboratory requirements.

BNL will ensure the proper storage and control of peroxide forming chemical containers as per BNL ESH Standard 2.1.1. The following approach will be used:

- Survey all peroxide forming compound containers in five rooms from the pool of rooms that CMS indicates contain a chemical from Table 1 of ESH 2.1.1 (Use lottery to select departments/divisions/rooms).
- No more than 1 test per organization.
- BNL and BAO will jointly participate in the compilation and evaluation of this data.
- The field verification will be unannounced.
- Measure the percentage of containers properly labeled, stored, and tested.

Performance Level Metrics

	Score
Outstanding	>90 %
Excellent	80 – 90 %
Good	70 - 79.9 %
Marginal	60 - 69.9 %
Unsatisfactory	<60 %

Environment, Safety, and Health Supporting Assessment Measures

Combined with the specific performance measures discussed above, these activities define the scope of planned institutional level assessments that support BSA's ES&H performance objective. Performance relative to these assessment activities is considered in the evaluation of the Laboratory's self-assessment program addressed under Measure 3.1.1.1, Assessment and Improvement.

Environmental Compliance: The Laboratory has established a program to evaluate compliance to applicable regulations on a three-year cycle. The focus of the Laboratory's programmatic assessment in this area during FY02 will be in the following areas:

- Air Emissions (radioactive and non-radioactive; i.e., Clean Air Act and NESHAPs)
- PCB Management

Maintain ISO 14001 Registration: BSA has committed to maintaining BNL's ISO 14001 Environmental Management System registration to satisfy requirements in the BSA/DOE contract and the DOE/EPA Memorandum of Agreement (3/98). In order to maintain the registration certificate, the Laboratory will undergo a surveillance audit in Spring 2002. Two independent auditors will conduct a four-day audit covering a subset of the EMS Program requirements.

Note: Internal programmatic assessments of select EMS Program requirements will be conducted as part of the QA Program Verification of key Management Systems (see measure 3.1.1.2 for further description).

Progress Toward Accelerator Authorization Basis Upgrades: BSA has a 5-year schedule for upgrading accelerator authorization basis documents to fully conform to current requirements and expectations. BSA will review progress towards this and take management action, as necessary, to ensure progress is made to complete the upgrade in accordance with the June 23, 2000 Accelerator Facilities Implementation Plan and SBMS requirements.

Radiological Control: BSA is required to conduct a comprehensive assessment of the Radiological Control Program over a three-year period. In FY02, the Laboratory programs and implementation will be assessed in the following areas:

- ALARA Program
- Organization and Administration
- External Dosimetry
- Radiological Dose Reports to individuals
- Emergency Exposure Situations
- Instrumentation and Calibration
- Release Criteria

In addition to those assessment activities, BSA will consider the following indicators for evaluation of the Laboratory's ALARA Program. Management action will be taken to address deviations from expected performance trends.

- Personnel Contamination Events
- Radioactive Exposures

Recycling of Solid Waste: BSA will monitor the solid waste recycling rate based on established and accepted performance measures to continue as an active participant in Brookhaven Town's Solid Waste Recycling Program. Management action will be taken (e.g., improve employee awareness through communication with BNL employees via our custodial workforce, Brookhaven Bulletin, Monday Memo, etc.) as appropriate to improve the percentage of solid waste recycled.

Regulated Waste Management: BSA will monitor and evaluate the following indicators to evaluate regulated waste management activities. Management action will be taken to address significant deviations from expected performance trends:

- Track and trend waste generation rates for routine and non-routine waste streams. Communicate results to Laboratory management and waste generating organizations.
- Assess compliance of BNL waste accumulation activities by assessing compliance at all 90-day accumulation areas and a representative sampling of Satellite Accumulation Area's (SAA's).
- Assess compliance with DOE Order 435.1, Radioactive Waste Management, WMD's 435.1 Implementation Plan, and the BNL Radioactive Waste Management Basis Document.
- Perform all regulatory reporting on time.

Safety and Health: In the area of safety and health, BSA will evaluate elements of the Laboratory programs and implementation for the analysis and controls for the following:

- Design Review Program
- OSHA Regulated Carcinogens
- NFPA 70E Compliance
- Biohazards/Biotoxins
- Construction Safety Inspection
- Industrial Exhaust Ventilation

Worker Involvement in Work Planning and Control: A critical element of Integrated Safety Management is the involvement of workers in work planning and control activities. BSA conducted baseline surveys in FY1999 and FY2000. A reassessment will be conducted as a measure of the worker's perspective of their involvement in work planning and control activities. The results will be evaluated to help direct management response to observed trends.

Objective 3.3 Site Infrastructure, Facilities, and Operations

The weight of this Objective is 10%.

BNL will maintain and improve the efficiency and reliability of the site infrastructure and manage projects to upgrade site facilities to meet the objectives of the Strategic Facility Plan and Master Site Plan. Site operations will be managed to ensure effective protection of personnel, property, the general public, national security interests, proprietary information, classified matter, and sensitive unclassified information.

3.3.1 Pursue Alternative Financing for Infrastructure Projects

The weight of this Measure is 30%.

Purpose and Supporting Information

It is apparent that available infrastructure funding at BNL (capital replacement, capital renewal) is not adequate to meet past, current and future needs. Under funding of infrastructure has persisted throughout the 1990's and has resulted in very large backlogs of infrastructure requirements. Therefore, BSA will continue to evaluate whether "third-party" (non-DOE) project funding is available, feasible and should be used to meet selected infrastructure needs.

Depending on the nature of the project, third-party funding could come from a variety of sources, including energy services performance contractors (ESPC's), utility energy services contracts (e.g., with NYPA, LIPA, KeySpan), private sector developers, BSA financing, New York State financing, or grants from other government (non-DOE) agencies.

We believe that the most attractive method of funding an infrastucture need at BNL is through "direct" federal funding (construction/operating funds) of the project or need. Absent that funding, third-party funding may be an acceptable means of accomplishing needed projects. Our criteria for using third-party funding is:

- No DOE or BNL funding available for the project.
- Project investment could be repaid using the savings resulting from project implementation – preferably from investments with less than a five-year payback (future operating funds would not be "mortgaged.")
- The project could be repaid by available/related revenues paid by willing "customers" deriving direct benefits (e.g., space charges on new or renovated space) and other benefits accrued to the Laboratory (attracting new research, improved user experience, improved image, improved quality of work-life for employees).
- The project is deemed by BSA to be essential to continued Laboratory operations and no reasonable alternative funding exists (e.g., available funding committed to equal or higher priority projects).

BSA has already begun to seek opportunities to use "third-party funding beginning in FY2001. This measure will drive BSA's continued commitment to on-going efforts.

Measures

- Make opportunities known to potentially interested parties through solicitations, advertisements, targeted letter writing, and other interactions - 1 point awarded per solicitation, advertisement, letter campaign, etc.
- Meet with and work with "third-parties" to investigate and develop economically attractive projects - 2 points awarded per formal discussion/negotiation with a third-party.
- Enter into agreement or contract to fund (or partially fund) and/or develop an acceptable/feasible third-party funded project(s) at BNL - 8 points awarded per third-party project.

Performance Level Metrics

Performance on this Third-Party Project (TPP) effort will be evaluated by adding the above point values for efforts in FY2002, as follows:

Outstanding	=>8 points
Excellent	=7-8 points
Good	=5-6 points
Marginal	=3-4 points
Unsatisfactory	=<3 points

3.3.2 Project Management

The weight of this Measure is 70%.

Purpose and Supporting Information

In a regime of very scarce infrastructure resources, BSA will manage its construction and construction-like projects to ensure scope, schedule and cost objectives are readily met. Approved projects are completed on time, within budget, and meet baseline expectations. Uncosted carryovers are minimized.

This performance measure is for all capital-funded construction projects, excluding Strategic Systems (formerly Major Projects and Major Systems Acquisitions) and EM Projects. It is measured as a composite that accounts for the percent of capital funds committed and costed per fiscal year, the percent of projects on schedule, and the number of capital construction projects with scope completed within the Total Estimated Cost (TEC). The formula for calculating the performance is:

PROJECT RATING (PM): $(PM) = 0.2\ (a^1 + a^2) + 0.2\ (b^1 + b^2) + 0.2\ (c)$

Each variable is discussed below as separate measures:

3.3.2.1 Funds Committed: (a^1)

$(a^1) = \frac{\textit{Actual Funds Committed}}{\textit{Total Planned Funds Committed}}$

Description of Proposed Method

Actual Present Year Funds [Line Item + GPP] Committed
Total Planned [Line Item + GPP] Committed

Notes

1. Measure funds commitment performance only for funds received in the fiscal year being measured.
2. Total planned funds committed excludes planned contingency funds (usually about 12 percent).
3. Only planned (requested) project funds will be included.
4. Funds committed (obligated) will continue to be measured when contracts and PO's are "pinned," as reflected in the B&E Report.

3.3.2.2 Funds Costed: (a^2)

$(a^2) = \frac{\textit{Actual Funds Costed}}{\textit{Total Planned Funds Costed}}$

Description of Method

Actual Present Year Funds [Line Item + GPP] Costed
Total Planned [Line Item + GPP] Costed

Notes

1. Measure funds costed performance for funds received in fiscal year being measured.
2. Only planned (requested) project funds will be included.

3.3.2.3 Project Schedule Compliance (GPP and IHEM): (b^1)

$(b^1) = \frac{\textit{No. of GPPs Completed on Schedule}}{\textit{No. of GPPs Scheduled to Complete}}$

Description of Method

1. BNL and DOE agree on actual completion milestone dates and document and track them in the Plant Engineering Monthly Project Report.

2. List all GPP and IHEM projects with TEC >$300K and completion milestone falling in current fiscal year.

3. Determine how many were completed on-time using construction "substantially complete" as complete.

4. "Substantially complete" means project is ready for beneficial occupancy or use, as described in the Project Management Control System.

Notes

1. GPP and IHEM project schedules will be established in cooperation with BHG in continuation of current approval process.

3.3.2.4 Project Schedule Compliance (Line Item): (b^2)

$$(b^2) = \frac{\text{No. of Line Item Milestones}(^1)\text{ Completed on Schedule}}{\text{No. of Line Item Milestones}(^1)}$$

(1) Key controlled Milestones

Description of Method

- BNL and DOE agree on actual baseline completion milestone dates and document and track them in the Plant Engineering Monthly Report.

- List all Line Item projects with key controlled milestones falling in the current fiscal year.

- Determine current year milestones completed on or ahead of schedule.

Notes

1. Key controlled milestones are those described in the approved Project Management Plan:

2. Design Start
   - Design Complete
   - Construction Start
   - Construction Complete

3. Construction complete is defined as "substantially complete."

4. "Substantially complete" means project is ready for beneficial occupancy or use as described in the Project Management Control System.

3.3.2.5 Scope Completed Within Approved Baseline (Line Item, GPP and IHEM [>300K]): (c)

$$(c) = \frac{\textit{Projects completed within Approved Baseline}}{\textit{Total Projects Complete}}$$

Description of Method

1. Review Line Item, GPP and IHEM (>$300K TEC) projects completed through the fiscal year.

2. Upon project completion, determine whether project baseline scope was completed within the approved baseline Total Estimated Cost (TEC).

3. Determine the total number of Line Item, GPP and IHEM (>$300K TEC) projects completed within approved baseline (approved original project and approved baseline change proposals)

4. Determine total number of projects completed.

Calculate:

$$(c) = \frac{\text{Projects Completed within Approved Baseline}}{\text{Projects Completed}}$$

Notes:

1. Justifiable BCPs will be approved by DOE-BHG for legitimate scope changes or reductions (i.e., due to program changes, reasonable unforeseen project conditions, new regulatory requirements, etc.)

2. Plant Engineering is not currently managing any projects classified as "Strategic Systems" under LCAM (formerly Major Projects and Major System Acquisitions). Presently, the RHIC Project is the only such project at BNL.

Performance Level Metrics

Outstanding	=0/90 to 1.00
Excellent	=0.80 to 0.89
Good	=0.70 to 0.79
Marginal	=0.60 to 0.69
Unsatisfactory	=less than 0.60

Site Infrastructure, Facilities, and Operations Supporting Assessment Measures (SAMs)

Combined with the specific performance measures discussed above, these assessment activities define the scope of planned institutional level assessments that support BSA's Site Infrastructure, Facilities, and Operations performance objective. Performance relative to these assessments is considered in the evaluation of the Laboratory's self-assessment program addressed under Measure 3.1.1.1, Assessment and Improvement.

Building Manager Program: BSA will monitor progress towards enhancement of the Laboratory's building manager program. The focus in FY 02 will be on ensuring progress in enhancing Facility Use Agreement documents and processes.

Safeguards and Security: BNL is required to conduct Safeguards and Security operations to ensure effective protection of national security interests, proprietary information, personnel, property, and the general public. To ensure these requirements are met, the BNL Safeguards and Security Division will conduct an annual self-assessment on the following elements:

- Program Planning and Management
- Protection Program Operations
- Information Security
- Material Control and Accountability
- Personnel Security

Counterintelligence: If the DOE Office of Counterintelligence or another DOE entity does not conduct an annual inspection of the CI Program, BSA/BNL will conduct an internal self-assessment on the following elements:

- Personnel Management/Resource Allocation
- Foreign Visits and Assignments
- Investigations/Liaison Activities
- CI Cyber Security
- CI Awareness
- Executive Management/Program Management
- CI Analysis/Threat Assessment

Emergency Planning and Preparedness:

Several aspects of the Laboratory's infrastructure related to emergency preparedness are aging (e.g. site siren system, plectron system, and response support centers). Site facilities and hazards have also changed. Due to the investment required for upgrades, the laboratory needs to thoroughly evaluate the associated costs and benefits. Three such analysis will be conducted in FY02. Each are briefly described below.

Evaluation of the Site Siren System: The site siren system has been in place for over 30 years. Currently it is used to inform Laboratory personnel of an emergency, and to alert emergency response personnel to report to their emergency response locations. A cost-benefit analysis of the site siren system will be conducted to determine if, based upon the current hazard conditions at the Laboratory, it is still a viable system.

Monitoring and Assessment Support Center (MASC): The MASC was developed and was utilized primarily for emergencies initiated by the HFBR or the BMRR. There are other radiological hazards, which still exist at BNL which can be managed out of the MASC. A cost-benefit analysis, taking into account the current hazards at BNL, will be conducted to determine if the MASC is still a viable entity, and make recommendations to either eliminate it completely or modify its functionality.

The Plectron System: One of the primary means of warning BNL personnel of lab-wide events is the Plectron tone-alert warning system. The current system is many years old and components are failing and in need of repair. Federal Communications Commission rules will be changing in the next four years to require a change in the frequencies used at BNL, including the Plectron frequency. An analysis of the usefulness of the current system will be performed. The analysis will include recommendations regarding replacement with a state-of-the art system including the ability and costs associated with incorporating the system into buildings' public address system.

Emergency Plan Consolidation: The BNL Emergency Plan, maintained by the Emergency Services Division, deals primarily with radiological and to a lesser extent chemical hazards. A security plan maintained by the Safeguards and Security Division deals with security-related events and response.

The laboratory is developing a single plan for BNL to cover all hazards including security. That information which will cause this new plan to become classified will only be incorporated by reference. BSA will monitor progress toward emergency plan consolidation and take actions as necessary to ensure timely completion of the consolidation initiative.

Energy Management: BSA will monitor building and energy consumption rates based on established and accepted performance measures to continue BNL's long history of active energy management. Management action will be taken, within the constraints of available resources, towards meeting Federal (Executive Order) and DOE goals.

Management of Maintenance Activities: BSA will continue its initiative to better understand and quantify BNL's maintenance requirements, resource shortfalls, and existing backlogs. This effort will be multi-pronged and will be aligned with DOE's efforts to better understand maintenance issues across the DOE laboratory complex.

- BSA will continue its senior facilities management initiative to perform a bottoms-up measurement of laboratory maintenance and capital renewal performed, annual needs and back-logs. We will strive to use facility management industry standard definitions, and will work with all levels of DOE to improve the consistency of maintenance reporting.

- BSA will conduct a Condition Assessment Survey (CAS) of its remaining (not surveyed in past three years) structures in FY02. This survey will allow the Laboratory to "catch up" on CAS, and will complete the three-year cycle. Buildings will be inspected using qualified, experienced personnel and "high-level, walk-through" techniques. The purpose of this inspection will be to improve BNL's maintenance backlog numbers and building condition data

- BSA will continue to populate requested fields in DOE's FIMS database. FIMS data will be quality checked to assure accuracy using statistical sampling techniques.

- BSA will respond accurately and timely to DOE-HQ maintenance data calls.

Objective 3.4 Information Technology

BNL will provide a cost effective, reliable, and secure computing/communications infrastructure for administrative computing, and support to scientific programs for unique computing problems.

The weight of this Objective is 10% of total.

Performance Level Metrics

Note: All the measures within this objective are date driven milestones. The following metrics apply:

Metric: Each milestone will be awarded points as follows based on accomplishment of that milestone:

Outstanding	Bettering a milestone date by >30 days	4 Points
Excellent	Meeting a milestone date	3 Points
Good	Missing a milestone date by <45 days	2 Points
Marginal	Missing a milestone date by >45 days	1 Point
Unsatisfactory	Missing a milestone date by >90 days	0 Points

The evaluation of the Performance Measure will be the numerical average of the scores of the supporting milestones.

3.4.1 Cyber Security

The weight of this Measure is 55%.

Purpose and Supporting Information

BNL will maintain/improve a Cyber Security program that is designed to protect the unclassified portion of the computing and networking infrastructure from attacks originating from inside or outside the Laboratory, based on: social engineering, physical destruction of network components, or electronic attacks utilizing the network and the Internet. The program must balance the need for openness and the science mission against the security required to reduce the threats to acceptable levels. Two elements of this measure are:

- Completion of the Laboratory's computer security program according to DOE guidelines and directives, and as documented in BNL's Cyber Security Program Plan (CSPP).
- Establishing mechanisms to test, review and evaluate the CSPP to ensure it's value as a "living document;" as such, it will continue to meet the rapidly evolving cyber security risks, with response to external/internal threats balanced appropriately against the needs of the Laboratory science mission.

Performance Measure Milestones

3.4.1.1 Cyber Security Program Plan implementation

The weight of this Measure is 50%.

1. Complete the deployment of Kerberos (token-based, single sign-on, authentication system) and the phase-out of clear-text, reusable passwords by 03/31/02.
2. Based on the results of the Kerberos pilot, evaluate and deploy a Kerberos (token-based, strong authentication system) pilot, using Lightweight Directory Access Protocol (LDAP) as the common Application Program Interface (API) by 9/30/92.
3. To ensure an effective host-based security architecture, complete the deployment of HP Openview, with emphasis on installing agents on the scientific desktops by 12/31/01.
4. Begin implementation of the Cyber Security Application strategy developed in FY01. The strategy will address the security requirements of both mission/enterprise applications and infrastructure applications. 01/31/02

3.4.1.2 CSPP Test, Review, and Evaluation Mechanisms

The weight of this Measure is 50%.

1. Establish a formal review process for the CSPP with Cyber Security Operations, Department Chairs ("Line Management"), the Cyber Security Advisory Council (CSAC), Counterintelligence, and DOE/BAO, focused on the need for continual upgrade of the Program. 12/31/01
2. Establish a plan for utilizing the results produced by the MITTENS (Monitoring Independent Trends to Enhance Network Security) tool and distributing the resultant assessment/advice site-wide. This should include strategy for how BNL (i.e. BNL System Administrators) should respond to MITTENS output as well as a process for incorporating any newly-detected threats into the CSPP review/upgrade process. 04/30/02
3. Establish a process for the review of scientific IT requirements in order to determine those impacts on BNL's Cyber Security program that could force additional IT investments. For example, Network

upgrades, driven by the requirements of scientific programs for increased bandwidth (OC12) will require hardware upgrades to maintain an effective Perimeter Defense Network. 04/30/02

4. Introduce a formal threat analysis program as described in the BNL CSPP, including a description of how results of associated risk assessments will drive changes to the CSPP. 09/30/02
5. Develop a plan for responding to the Cyber Security "paradigm shift", predicted within the next 3-5 years, i.e. a dramatic change in strategy/technology, not to be confused with "continuous improvement". Experts predict increased intensity of attacks using strategies and techniques that will greatly outpace current defense mechanisms. The plan must include mechanisms for raising Laboratory awareness as well as defining the approaches required to keep pace with technology advances -- which will affect both the threats and the defense strategies. As the Cyber Security environment changes, the Critical Assumptions on which the BNL CSPP was established will no longer be true, driving a total re-engineering of the Program. 09/30/02

3.4.2 Scientific Computing Infrastructure

The weight of this Measure is 45%.

Purpose and Supporting Information

BNL will continue to develop and maintain a scientific computing infrastructure that is fully supportive of the Laboratory's scientific mission, focusing on those areas where leveraging existing expertise and local/regional collaborations can produce significant improvement over the current status. This includes:

- Strengthening and upgrading the existing Visualization Program to address the visualization and data analysis requirements for the major BNL scientific initiatives--in particular, for RHIC and ATLAS.
- Strengthening and upgrading the scientific computing resources present in the BNL Computing Facility (BCF), to provide strategic value to the major scientific programs at the Laboratory, as well as to local/regional collaborations.
- Inaugurating a program of New Technology Implementation Assessments (NTIAs). Within this program, a specific new information technology will be investigated for a given Laboratory program/application, by mutual agreement with program/application owner.

Performance Measure Milestones

3.4.2.1 Visualization Program

The weight of this Measure is 33.3%.

1. Implement and support a high-speed visualization system based on parallel processing techniques on a Linux Cluster platform. Milestone date: 02/28/02
2. Develop and deploy remote visualization methods using Linux clusters as visual servers with visual workstations on the scientists' desktops as clients. Milestone date: 06/30/02

3.4.2.2Computing Resources

The weight of this Measure is 33.3%.

1. Upgrade the high-performance computing resources required for support of Laboratory scientific initiatives; particularly the hardware and advanced system administration for the BNL Linux Cluster (BLC). This includes augmentation of the cluster processors by at least 50% and deployment of a Storage Area Network for both the Linux and Sun systems. Milestone date: 09/30/02

2. Commence installation and testing of a prototype configuration for the BNL Riken QCDOC machine by 09/30/02.

3.4.2.3New Technology Implementation Assessments (NTIAs)

The weight of this Measure is 33.3%.

1. Perform a prototype New Technology Implementation Assessment for integrating the Java programming language into the AGS Control system by 7/31/02.
2. Establish a service for Parallel Processing Conversion of legacy computer codes, so that they may take advantage of the speedup and cost effectiveness inherent in distributed memory cluster processors. Milestone date: 02/28/02
3. Initiate a program of investigating, deploying and supporting Computational Grid technology; which is likely to serve as the mechanism for a number of multi-site collaborations, including US Atlas and the DOE SciDac programs. Milestone date: 09/01/02

Information Technology Supporting Assessment Measures (SAMs)

Combined with the specific performance measures discussed above, these assessment activities define the scope of planned institutional level assessments that support BSA's Information Technology objective. Performance relative to these assessments is considered in the evaluation of the Laboratory's self-assessment program addressed under Measure 3.1.1.1, Assessment and Improvement.

Information Services: BNL will continue to enhance the institutional-level information services needed to improve the site-wide computing/communications infrastructure, with emphasis on those services that will both improve efficiency and reduce cost while ensuring that the requirements of BNL's scientific mission are met. FY02 initiatives focus on developing a Network Bridging Plan and developing a resource-efficient NT server environment. BSA will monitor progress towards achieving the goals of these initiatives.

World Wide Web: BNL will continue to establish the World Wide Web support model that will address the Laboratory's requirements. This model is defined by a centralized component or Center of Excellence for technical support and a distributed component, for support of local web functionality. The Center of Excellence will be created for the application of web technologies to support BNL scientific and administrative initiatives, with focus on web application programming, web server, and database technologies. BSA will monitor progress towards these initiatives.

Objective 3.5 Communications and Trust

The Laboratory will enhance the foundation of trust and confidence it has built by: strengthening existing relationships and building new relationships with key stakeholders, elected and appointed officials, civic leaders, and other important constituencies; effectively communicating the Laboratory's scientific initiatives and accomplishments; generating community enthusiasm for Laboratory research programs; and working to fulfill the education mission shared with DOE.

The weight of this Objective is 10%.

Purpose and Supporting Information

The Laboratory's Communications, Community Involvement, and Education Program plans serve as a guide to the many activities and initiatives that will be pursued in FY02 to fulfill this objective and to help meet the expectations and performance measures of science and operational departments and divisions across the Laboratory.

Each element of the plan will include associated self-assessment activities for the appropriate organization (e.g. CIGPA, Departments, and Divisions). Stakeholder feedback will be collected and research and self-assessments will be conducted throughout the year to determine program effectiveness, to evaluate program utility, and to make mid-course corrections as necessary.

Performance towards this objective will be based on accomplishment of the goals set forth in the Communications, Community Involvement and Education plans. BNL and BAO will conduct an independent peer review process or other selected process that both parties agree is necessary and appropriate to evaluate the Laboratory's communications, community involvement, and education programs. The peer review or other process selected will focus primarily on the measures below.

Measures

3.5.1 Building Regional and National Recognition

The weight of this Measure is 50%.

The objective of this measure is to increase regional and national recognition of the Laboratory and the Department of Energy. Strategic issues include enhancing the effectiveness of Laboratory communications with internal and external publics, showcasing the results of Lab research with special emphasis on RHIC and other high profile initiatives that produce exciting and scientifically interesting new information, building relationships with the press, and developing and improving the Laboratory's use of electronic media.

Other science initiatives, e.g. a BNL nanoscience center, are carefully tracked and communications plans are prepared and updated in anticipation of developments during FY02.

The World Wide Web continues to grow in importance as a medium for national recognition of scientific progress. During FY02, the Laboratory will reorganize its educational web site, revamping and updating graphics to complement and conform to the main scientific pages. New content will be introduced, target audiences will be refined and the metatags and other aspects of the educational web site will be upgraded to optimize search ability and enhance ease of use for visitors.

The Laboratory will design and launch a new web-based virtual publication to aid in showcasing science developments, exploring their significance and excitement and recognizing the role funding agencies, particularly the Department of Energy, in making them possible.

The Lab's Office of Educational Programs (OEP) has played an important but limited role in gaining regional and national recognition for the Laboratory and the Department of Energy. The strategic thrust of OEP for FY02 will be the planning of a new strategic direction and the development of a comprehensive plan to enhance current activities, explore new directions, and fulfill the education mission that the Laboratory shares with the DOE. An educational programs plan will be prepared and initiation of the plan will commence by 4th quarter FY02.

3.5.2 Stakeholder Involvement and Understanding

The weight of this Measure is 50%.

The Laboratory is committed to ensuring that internal and external stakeholders have access to information about issues of interest and concern, and to providing two-way channels of communication so that stakeholders feel there is a frank and open dialogue with Laboratory management on issues of importance. Responsibility for stakeholder involvement on specific projects rests primarily with the project line manager with strong support from the Laboratory in terms of issues identification, community involvement training programs, information materials development, communications activities such as meetings and roundtables, collection and evaluation of community input, and feedback to the community. For FY02, the Laboratory will:

- Develop an Issues Anticipation Process, linked to the BNL Article Tracking Database and other internal and external sources. The goal of this process will be to better systematize the identification of potential and nascent issues that may affect the Laboratory and its stakeholders, to analyze these issues at some early stage in their development, and to begin developing appropriate and effective programs, focused on the issues.
- Upgrade the training concentration of Level 1 and 2 managers in the community involvement and decision-making process from the current 40 percent to 75 percent.
- Establish an advisory committee and introduce a new volunteerism initiative, entitled Partnership BNL, that will provide support for employee volunteers who wish to act as project managers for selected non-profit, charitable and other civic initiatives. The committee will analyze requests, arrange for support, review feedback on approved programs, and plan recognition for volunteers.

The Laboratory expects the results of a just-completed employee survey to become available at the outset of FY02. Analysis of the communications elements of that survey will be used to generate a plan to upgrade and enhance employee communications for FY02 and beyond. The plan to guide this upgrade will be developed at the close of 1st quarter FY02; employee and senior management feedback will be gathered and modifications will be incorporated during 2nd quarter; and initial implementation of the plan is expected for 3rd quarter.

In addition, work will be initiated to introduce an HTML/PDF-based searchable archive for the Brookhaven Bulletin

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.3

APPENDIX C

SPECIAL FINANCIAL INSTITUTION ACCOUNT

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

APPENDIX C

SPECIAL FINANCIAL INSTITUTION ACCOUNT

DOE WILL COOPERATE WITH THE

SELECTED CONTRACTOR TO ARRANGE AN

APPROPRIATE AGREEMENT -- SEE

PART III, SECTION J, APPENDIX C

CHECKS-PAID METHOD OF LETTER OF CREDIT FINANCING

This agreement is entered into this First day of January 1998, between the UNITED STATES OF AMERICA, represented by the Department of Energy (hereinafter referred to as DOE); Associated Universities, Inc., corporation/legal entity existing under the laws of the State of New York, or successor contractor, (hereinafter referred to as the Contractor); and Chase Manhattan Bank, a banking institution wholly owned by Chase Manhattan Corporation, existing under the laws of the State of New York, located at 55 Water Street, Room 718, New York City, NY 10041, (hereinafter referred to as the Bank).

RECITALS

(a) On the effective date of August 21, 1995, DOE and the Contractor entered into Modification No. M327 of Contract No. DE-AC02-76CH00016, or successor contract, providing for transfer of funds on a payments-cleared basis.

(b) DOE requires that amounts transferred to the Contractor thereunder be deposited in a Special Demand Deposit Account at a financial institution covered by the U.S. Department of Treasury - approved Government deposit insurance organizations that are identified in I TFM 6-9000.

These special demand deposits must be kept separate from the Contractor's general or other funds; and the parties are agreeable to so depositing said amounts with the Bank.

(c) The special demand deposit account shall be designated Associated Universities, Inc. (or successor Contractor)/Brookhaven National Laboratory General Operating Account.

COVENANTS

In consideration of the foregoing, and for other good and valuable considerations, it is agreed that:

(1) The Government shall have a title to the credit balance in said account to secure the repayment of all funds transferred to the Contractor and said title shall be superior to any lien or claim of the Bank or others with respect to such accounts.

(2) The provisions of said contract(s) between DOE and the Contractor relating to the transfer of funds into and withdrawal of funds from the special demand deposit account, but the Bank shall not be responsible for the application of funds withdrawn from said account. After receipt by the Bank of directions from DOE, the Bank shall act thereon and shall be under no liability to any party hereto for any action taken in accordance with the said written directions. Any written directions received by the Bank from the Government upon DOE stationary and purporting to be signed by, or signed at the written direction of, the Government may, insofar as the rights, duties, and liabilities of the Bank are concerned, be considered as having been properly issued and filed with the Bank by DOE.

(3) DOE, or its authorized representatives, shall have access to financial records maintained by the Bank with respect to such a special demand deposit account at all reasonable times and for all reasonable purposes, including, but without limitation to, the inspection or copying of such financial records and any or all memoranda, payment requests, correspondence, or documents pertaining thereto. Such financial records shall be preserved by the Bank for a period of six (6) years after the final payment under this Agreement.

(4) In the event of the service of any writ of attachment, levy of execution, or commencement of garnishment proceedings with respect to the special demand deposit account, the Bank will promptly notify the Department of Energy at the Chicago Operations Office, 9800 S. Cass Avenue, Argonne, Illinois 60439.

(5) DOE shall authorize funds that shall remain available to the extent that obligations that have been incurred in good faith thereunder by the Contractor [Associated Universities, Inc., or successor Contractor] to the Bank for the benefit of the special demand deposit account. The Bank agrees to honor upon presentation for payment all payments issued by the Contractor and to restrict all withdrawals against the funds authorized to an amount sufficient to maintain the average daily balance in the special demand deposit account in a net positive as close to zero as administratively possible.

If the calculated average daily balance for the month, inclusive of the time deposit account, results in a positive account balance which exceeds the balance needed to cover transaction costs for that month, and the financial institution had no control over the positive balance, the financial institution will compensate DOE for the loss of the availability of funds by multiplying the average daily balance for the month by the Treasury Tax and Loan Funds Rate divided by 12. If the financial institution caused the positive account balance, it shall compensate by multiplying the excess fund balance by the Federal Funds Rate adjusted for the proper period of time. The compensation will be remitted to the cognizant DOE finance office.

The Bank agrees to service the account in this manner based on the requirements and specifications contained in this Agreement, in consideration of the placement by DOE of a noninterest-bearing time deposit in an amount agreed upon. The Bank agrees that per item costs, detailed in the Attachment C "Quotation Pricing Sheet" contained in the Bank's aforesaid bid will remain constant during the term of this Agreement, but may be reviewed for adequacy at the request of either party, with a formal review required semiannually. The contractor will withdraw $565,000 in funds from the special demand deposit account in the Bank. This account will hereinafter be defined as the time deposit account. The funds in the time deposit will remain on deposit and shall not be withdrawn or used for any purposes without the authorization of DOE. The amount of the deposit may be adjusted upward or downward but only with the approval of DOE.

(6) The Bank will post collateral, acceptable under Department of Treasury Circular No. 176, with the Federal Reserve Bank in amount equal to the net balances (including the noninterest-bearing time deposit account) in all of the accounts included in this Agreement.

(7) This Agreement, with all its provisions and covenants, shall be in effect for a term of two years, beginning on the first day of January, 1998, and ending through the thirty-first day of December, 1999.

(a) DOE may extend the term of this Agreement for an additional one year term by written notice to the Contractor and the Bank provided that DOE shall give the Contractor and Bank a preliminary written notice of its interest at least 90 days before this Agreement expires. The preliminary notice does not commit DOE to an extension.

(b) If the DOE exercises this option, the extended agreement shall be considered to include this option provision.

(c) The duration of the Agreement; including the exercise of any options under this Covenant, shall not extend past December 31, 2000.

(8) DOE or the Contractor may terminate this Agreement at any time within the agreement period submitting written notice to the other parties 90 (ninety) days prior to the desired termination date. The specific provisions for operating the account during the 90 (ninety) day period are contained in Covenant (11).

(9) DOE or the Contractor may terminate this Agreement at any time within the agreement period upon 30 days written notice to the bank if DOE or the Contractor, or both parties find that the bank has failed to substantially perform its obligations under this Agreement or that the Bank is performing its obligations in a manner that precludes administering the program in a effective and efficient manner or that precludes the effective utilization of the Government's cash resources.

(10) Notwithstanding the provisions of Covenants 8 and 9, in the event the contract (referenced in Recital (a) between the DOE and the Contractor) is not renewed or is terminated, this Agreement between DOE, the Contractor and the Bank may be terminated automatically by DOE or will be assignable to a successor Contractor upon the delivery of written notice to the Bank.

(11) In the event of termination or expiration the Bank agrees to retain the Contractor's special demand deposit account for an additional 90-day period to clear outstanding payment items. Within seven (7) days of expiration of the agreement an analysis of the special demand deposit account shall be made by the DOE to determine whether an insufficient or excessive balance was maintained in the time deposit account to compensate the Bank for services rendered up to the expiration date.

(a) If the analysis indicates that the Bank has been insufficiently compensated for services rendered up to the expiration of the Agreement, the Contractor shall-

(1) Maintain on deposit, during this 90 day period; sufficient Federal funds to reimburse the Bank for prior cumulative loss of earnings, and

(2) Maintain on deposit in the time deposit account sufficient Federal funds to compensate the bank for services rendered.

(b) If the analysis indicates that the Bank has been overcompensated for services rendered up to the expiration of the Agreement, DOE shall close out the time deposit account and secure from the Bank a payment in an amount equal to the cumulative excess compensation less compensation for estimated services to be rendered during the 90-day period.

(c) If cumulative excess compensation is not sufficient to compensate the Bank for services rendered during the 90-day period, adjustments will be made to the time deposit account to compensate the Bank for the difference between the cost of services rendered during the 90-day period and the cumulative excess compensation.

During the entire 90 day period, it is further understood that:

(a) The Bank shall maintain collateral in an amount sufficient to collateralize the highest balance in the account, less Federal Deposit Insurance Corporation coverage on the accounts.

(b) All service charges shall be consistent with the amounts reflected in this Agreement.

(c) All terms and conditions of the aforesaid bid submitted by the Bank which are not inconsistent with this 90-day additional term shall remain in effect

(d) This agreement shall continue in effect, with exception of the following:

(1) Funds Authorized (Covenant 5)

(2) Term Agreement (Covenant 7).

(3) Termination of Agreement (Covenant 8 and 9).

The Bank has submitted the forms entitled "Offeror Representations and Certifications" and "Quotation Pricing Sheet," the latter of which includes the calculation of required compensating balance. These forms have been accepted by the Contractor and the Government and are incorporated herein with the document entitled "Financial Institution's Information on the Checks-Paid Letter of Credit" as an integral part of this agreement.

Any direction received by the Bank from DOE which alters any portion of the terms and conditions of this agreement, including the amount of the time deposit agreed to herein, shall not be valid unless signed by the Contracting Officer.

IN WITNESS WHEREOF the parties hereto have caused this Agreement which consists of 5 pages including the signature pages, to be executed as of the day and year first above written.

12-5-97
Date Signed

ROBERT P. GORDON
CONTRACTING OFFICER
By _____
(Typed name of Contracting Officer)

_____
(Signature of Contracting Officer)

WITNESS

_____
(Typed Name of Witness)

_____
(Signature of Witness)

Note-In case of corporation, Witness not required. Type Names under all signatures.

Associated Universities, Inc.
(Typed Name of Contractor)

By Jerome Hudis
(Typed Name of Contractor's Representative)

_____
(Signature of Contractor's Representative)

Vice President and Controller
(Title)

1400 16th Street, N.W.
Washington, DC 20036
(Address)

December 3, 1997
(Date of Signature)

_____
(Typed Name of Witness)

_____
Signature of Witness)

The Chase Manhattan Bank
(Typed Name of Bank)

By Joseph M. Bognanno
(Name of Bank Representative)

_____
(Signature of Bank Representative)
*See attached letter.

Note-In case of corporation, Witness not required. Type Names under all signatures.

Vice President
(Title)

One Chase Square - Tower 8
Rochester, NY 14643
(Address)

December 22, 1997
(Date of Signature)

NOTE-The Contractor, if a corporation, should cause the following Certificate to be executed under its corporate seal, provided that the same officer shall not execute both the Agreement and the Certificate.

CERTIFICATE

I, Leland F. Willis, certify that I am the Vice President of Environmental Safety and Health of the corporation named as Contractor herein; that Jerome Hudis, who signed this Agreement on behalf of the Contractor was then Vice President and Controller of said corporation; that said Agreement was duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

Leland F. Willis (Corporate Seal)
(Signature)

NOTE-Bank Repository, if a corporation, should cause the following certificate to be executed under its corporate seal, provided that the same officer shall not execute both the Agreement and the Certificate.

CERTIFICATE

I, _____, certify that I am the _____

Of the corporation named as Bank Depository herein: that _____,

Who signed this Agreement on behalf of the Bank Depository was then _____

Of said corporation, the said Agreement was duly signed for and in behalf of said corporation by Authority of its governing body, and is within the scope of corporate powers.

_____ (Corporate Seal)
(Signature)

AG(C)

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.4

APPENDIX D

BUDGET PROGRAM

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

Appendix D

Budget Program

This Appendix implements the clause of this contract entitled, "Long Range Planning, Program Development and Budgetary Administration." The Parties agree that the following procedures will be used on a Government fiscal year basis to establish the Laboratory's work program and budgets.

1. During January - February of each year (or such other date as may be established by DOE), DOE will supply the Contractor with the dollar amounts for the Laboratory contained in the President's budget as well as a set of program assumptions for the budget and accounting policies and procedures to be used in the current budget preparation.

2. Prior to April 1 of each year (or such other date as may be agreed upon), the Contractor will submit to DOE a detailed work program and budget estimate for the next two succeeding fiscal years based on the level of the current year financial plan and the President's Budget, or other program guidance provided by DOE. The Contractor will provide construction project data sheets to DOE for each construction project proposed for the budget year and revisions of the construction project data sheets for other years as necessary for changes in cost estimate, funding, or scope. Prior to submission of the data sheets, DOE will be given an opportunity to review draft construction project data sheets and present the results of that review to the Contractor for consideration in the final data sheets.

3. As soon as possible after October 1 of each year, DOE shall issue to the Laboratory financial plans for the current fiscal year for operations and plant and capital equipment.

4. DOE approval of the work program and budget estimates will be reflected in approved funding programs, prime contract supplements and program letters/authorization, issued to the Contractor as soon as possible after October 1. The approved funding programs specify the funds available for work under the contract for the fiscal year and, in addition, establish obligations and cost limitations for specified individual portions of the work.

5. *An initial* modification to this contract will be executed *by the Parties* on or before November 1 of each fiscal year to provide all or portion of the funding for the current fiscal year, provided that appropriations have been made to DOE at this time, and if not then as soon as possible thereafter. *Subsequent* modifications will be written throughout the fiscal year to increase or decrease the available funding.

6. In order to provide added assurance of continuity of operations, it is the intent of DOE that the funds obligated under this contract be maintained at all times at an adequate level, which shall be defined as funds at least sufficient to provide for an estimated 20 days operating costs and outstanding commitments for each obligational control level as stated in the DOE Control and Reporting Levels. The Contractor will inform DOE when circumstances or DOE actions or proposed actions threaten to reduce any operational control levels below the level indicated in the previous sentence.

7. During the course of the work, DOE will review the work program and its costs based upon information submitted by the Contractor, and may, after consultation with the Contractor, revise the program letters and financial plans established by DOE under paragraph 4 of this Appendix.

8. It is recognized in the maintenance and operation of the Laboratory facilities, the Contractor is obliged to meet various standards and that DOE will make every effort to assure that adequate funds are provided under the contract to enable the Contractor to meet such requirements.

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.5

APPENDIX E

MAKE OR BUY PLAN

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

Appendix E
Modification No. M090
Supplemental Agreement to
Contract No. DE-AC02-98CH10886

Make-or-Buy Plan

Brookhaven National Laboratory

September 1999

BSA

BROOKHAVEN NATIONAL LABORATORY
BROOKHAVEN SCIENCE ASSOCIATES
UPTON, NEW YORK 11973-5000
UNDER CONTRACT NO. DE-AC02-98CH10886
UNITED STATES DEPARTMENT OF ENERGY

MAKE OR BUY IMPLEMENTATION PLAN

This plan has been prepared pursuant to Clause I.82 DEAR 970.5215-2 (Dec 2000), "Make or Buy Plan," of BSA's prime contract with the U. S. Department of Energy for the operation of the Brookhaven National Laboratory. It has been developed with a primary focus of providing supplies and services on a least-cost basis, giving due regard to such considerations as quality, affected employees and stakeholders. The Brookhaven National Laboratory will implement the formal aspect of this plan for the areas identified in Section III during FY 2000.

SECTION I – BACKGROUND

The DOE Contract Reform Team, established by the Secretary to conduct a comprehensive review of the Department's contracting practices, has recommended that Management and Operating contractors should make more rational decisions concerning whether to "make" or "buy" the products and services required by a project or program. According to the team, such decisions should be driven by the requirement to be more cost-effective and to be consistent with the long-term strategic objectives of DOE's programs.

Brookhaven Science Associates fully supports the philosophy of the Contract Reform Team. Brookhaven National Laboratory has been implementing it in the management of its prior (AUI) and current (BSA) contracts. In many areas, service contractors supplement BNL staff (e.g., engineering design, Central Shops, job shoppers, and trades) while in others, all required services are procured by contract (e.g., cafeteria operations, construction, Child Development Center operations). A listing of many of the contracted services ("Make or BUY") at BNL is reflected in Attachment I.

It is anticipated that the Laboratory will continue to subcontract the services listed in Attachment I in FY 2000, as well as in future years.

Management at various levels has continually reviewed the methods used for work accomplishment and adjusted the mix as appropriate to meet changing mission requirements while carefully balancing cost and quality. Examples of functional areas reviewed are also reflected in Attachment I.

In addition, two noteworthy examples of ongoing make-or-buy decision-making are BNL's approach to the Environmental Restoration (EM) program and the Financial Services Accounting System.

The EM Program is funded at a level of $18-20 million annually and is being implemented by a small BNL staff managing a series of major and minor fixed-price environmental services contractors and consultants.

The Financial Services Division (FSD) is using technology as an enabler to provide more efficient business processes for the Laboratory. One major change is the replacement of BNL's accounting system and all its feeders with a "Commercial off-the-shelf" suite of integrated financial packages. A subcontractor is performing the majority of this work. In addition the Division utilized "3rd Party Integrators" who have the knowledge and experience of other implementations to supplement its staff.

The implementation of new administrative systems began with installation of the PeopleSoft General

Ledger and Project Costing modules in July 1997. Purchasing and Accounts Payable modules were installed prior to FY 1999, and the remaining modules (Inventory, Asset Management Budgeting, Accounts Receivable, HR/Payroll and Benefits modules) will be implemented during FY 2000 and FY 2001. The estimated subcontracting costs are $384,000 - FY 96, $428,000 - FY 97,$327,000 - FY 98, and projected costs of $172,000 and $235,000 in FY 99 and FY 2000 respectively. Use of a subcontractor significantly reduced the need for manpower increases to the Financial Services Division.

SECTION II – STRATEGY

BSA is responsible for managing contract performance, including planning, placing, and administering subcontracts as necessary to ensure the lowest overall cost and technical risk to the Department of Energy, consistent with concerns of quality and availability, applicable labor laws and regulations, and collective bargaining agreements. To discharge this responsibility in a more effective manner, BSA utilizes a "make-or-buy" decision making process. As a part of this process, the objective is to "buy" indirect-cost functions and routine services unless it can "make" at a lower cost or has other overriding reasons leading to a "make" decision.

The Laboratory has identified several functions that are considered potential candidates for "make-or-buy" evaluation during FY2000. These are included in Section III, Candidate Functions for Evaluation. Using the graded approach, each of these functions will be systematically evaluated against a set of criteria, as outlined in Section IV. These criteria will be used as screens to evaluate and identify factors that may prevent the Laboratory from considering the least cost as a determining factor. The depth of analysis for each criterion will be commensurate with its applicability and its contribution towards the final decision. Results will be documented. The evaluation process will also consider the "make-or-buy" viability at the subfunction level when appropriate.

Policy – "Make-or-Buy" in the Quality Context

The following principles will guide the make-or-buy process at BNL. These principles are consistent with DOE's objectives for quality management and cost-effective operations, while maintaining BSA's commitments to its employees and the local community.

- Routine Services – BSA is committed to obtaining routine services from the least-cost source consistent with applicable labor laws and collective bargaining agreements.

- Excellence in Institutional Management and Facilities Operations – BSA is committed to achieving excellence in the management of the Laboratory and in the planning, design, construction, and operation of its programmatic and infrastructure facilities. All BSA make-or-buy decisions will balance cost and quality to ensure excellence in the final product.

- Quality Considerations – The quality process depends heavily on the correct relationship between management and employees; an environment of trust and communication, labor-management partnering, employee involvement and commitment on the part of leaders that people are, indeed, our most important resource.

- Core Institutional Management Competencies – BSA depends on the quality, technical background and "institutional memory" of its BNL managers to maintain the financial, environmental safety and health, and operational integrity of the Laboratory. The resource represented by the Laboratory's management staff is viewed as a significant core competency, critical to the Laboratory's continued success and pursuit of excellence. As a result, BSA will not evaluate a broad replacement of its in-house operations by a single integrated contractor. Make-or-buy reviews will focus on discrete operations.

- BNL Subcontracts – The BSA approach to make-or-buy will be structured such that any resulting new service contractors will be under contract to BNL. To deliver the quality performance expected by DOE, BSA must retain management control over all functional areas on site.

- Regional Economic Impacts – We believe BSA has an obligation as a corporate citizen to structure its make-or-buy process to be supportive of Long Island and New York State contractors and suppliers. This may include regional competition and preferences for Long Island and New York firms.

- Collective Bargaining Agreements – BSA has in place Collective Bargaining Agreements with three recognized bargaining units covering many of the functional areas that are or may become appropriate for review under the make-or-buy process. BSA will inform and involve designated representatives of these bargaining units in the process to the extent they agree to participate.

- Employee Information and Support – One of the typically "hidden" costs of a make-or-buy review is the effect on morale, productivity, and turnover of the staff whose jobs are being considered for outsourcing. BSA will take aggressive action to ensure all affected staff are kept informed as the make-or-buy process progresses. We will provide assistance to employees who may be displaced due to a decision to outsource services. Finally, we will encourage successful contractors to offer employment to incumbent BNL employees. All workforce decisions will integrate the requirements of Section 3161 of the 1993 Defense Authorization Act and DOE's implementation of it.

- Small/Small Disadvantaged Business – As part of the make-or-buy process, BSA will analyze the availability of services provided by regional small/small disadvantaged businesses. The decision on subcontract scope will consider this availability.

- Diversity – BSA will consider the potential impacts on the diversity of the in-house workforce, which may result from outsourcing.

- Past Experience - This principle considers the issue or past experience at the Laboratory regarding decisions for the same, or similar, supplies or services.

SECTION III – CANDIDATE FUNCTIONS FOR EVALUATION

The following list includes the non-programmatic functions, which are considered candidates for "make-or-buy" evaluation for FY 2000. This list is a not necessarily all inclusive and may change as new information becomes available or additional needs are identified.

FY 2000 Functional Areas
LAN Operations
Desktop Operations
Computer Hardware Maintenance (ITD)
Photocopying Services

These functions are reflected in Attachment I. Computer Hardware Maintenance was originally scheduled for FY 1999. This evaluation was deferred due to restructuring of the Information Technology Division and hiring a Chief Information Officer. It is now being included in a larger Make or Buy decision in FY 2000, for LAN/desktop operations. Photocopying Services is a proposed area for evaluation. This scope of this evaluation will be dependent on the recommendations off an ongoing reengineering effort.

BSA will identify additional specific Make or Buy functions to be reviewed for FY 2001 through FY 2003. These functions will be selected at the beginning of the fiscal year and added to Attachment I.

SECTION IV – EVALUATION CRITERIA

Each function in Section III will be evaluated in a manner such that the impacts of various factors on the "make-or-buy" decision are properly considered. The applicability and importance of these factors may vary depending upon the item to be evaluated. Generally, the quality performance at least cost should be the determining factor in reaching a "make-or-buy" decision unless an overriding reason is identified through the consideration of criteria 1 through 11 below. Evaluation of each item will include, but not be limited to, the following criteria.

1. **Availability of Satisfactory Source** – This criterion considers the competence, ability, experience, and capacity available from outside sources to establish that they could be responsive and responsible and be able to perform in a timely manner. The consideration will also include the diversity and quality of the vendor's workforce.

2. **Affirmative Action** – This criterion will consider the impact of the Laboratory's policy on affirmative action and upward mobility potential of protected class employees on "make-or-buy" decisions.

3. **Timeliness of Procurement** – This criterion considers the impact of procurement lead time on continuity of the Laboratory's operations and services.

4. **Control of Technical and Schedule Interface** – This criterion considers the Laboratory's ability to effectively control technical and schedule interfaces with other programs or operations as well as the necessity for close interaction between the Laboratory and the suppliers.

5. **Risk** – This criterion considers and quantifies the potential for unwanted negative consequences that may impact quality, cost, schedule, sensitive information, personal safety, property, or environment.

6. **National Security** – This criterion considers the impact on security when the work is of a classified nature or will involve technologies and/or materials that are classified or restricted.

7. **Maintenance of Core Competency** – This criterion considers the impact of outsourcing on the retention of key or unique in-house capabilities, capacities, or personnel deemed essential to recurring support functions or scientific needs. It will also consider whether in-house performance is considered key to ensuring quality, operational continuity, and environmental, safety, and health compliance as well as whether the function involves highly skilled, experienced personnel with knowledge of major BNL systems or facilities.

8. **Proprietary Processes and Information** – This criterion considers the issue or proprietary processes owned by the Laboratory, which may not be legally transferable to the outside source and the issue of proprietary information provided and handled by the Laboratory under CRADAs and other agreements with the private sector.

9. **Impact on Future Mission** – This criterion considers the issue of the impact of a "Make" or "Buy" decision on known future mission or program activities at the Laboratory.

10. **New Facilities** - This criterion considers the issue where the construction of new or additional facilities is required that the cost of such facilities is in he government's best interest when compared to subcontracting or privatization alternatives

11. **Contractual Agreements** – This criterion considers the impact of applicable constraints contained in collective bargaining agreements and other existing contracts on the "make-or-buy" decision. The Laboratory has collective bargaining agreements with three recognized bargaining units [International Brotherhood of Electrical Workers (IBEW) Local 2230, Long Island Guards Union, and Oil Chemical & Atomic Workers International.]

The IBEW Local 2230 contract prohibits subcontracting for a labor classification covered by the agreement for a period of one year after a layoff by the Laboratory in that classification. Related language establishes an employee (FTE) strength number or "ceiling" above which the Laboratory can layoff without invoking the "subcontracting clause." This language may impede the execution of this Plan by prohibiting the outsourcing of functions currently performed by bargaining unit employees. The IBEW Contract does provide that the Laboratory may be required to subcontract work in responses to a regulation or directive of the Department of Energy. The Union may terminate its contract if subcontracting the work

results in a layoff of its members.

In the event it still appears that a "buy" decision is still the preferred decision, anticipated operational improvements and cost will be evaluated (as indicated below) to determine whether outsourcing or in-house performance is the least cost.

Cost Benefit – This criterion considers operational improvements and the comparative cost of performing a function in-house versus contracting it out. The analysis will include, as applicable, the costs for subcontracting, new equipment and facilities for additional personnel and for maintaining continuity of operations when changing suppliers.

Make-or-Buy Plan FY 2000
Attachment I

Service/Function	Must Make	Must Buy	Can Make or Buy	Rationale for Make Decision
Analytical Services/Laboratory Analysis	X	X		BNL maintains an on-site laboratory as a Core Competence while also outsourcing to subcontractors under blanket orders large volume activity (i.e. Environmental Restoration) based on economic advantage due to infrastructure and turn around time.
Architect/Engineer (A/E) & Consulting Engineering Services	X	X		BNL maintains Core Competence A/E capability as part of Plant Engineering operations while also outsourcing to subcontractors under blanket based economic advantage due to irregular demand and turn around time.
Cafeteria Operations*		X		N/A
Chemical Hazardous & Radioactive Waste Disposal		X		N/A
Child Development Center Operation*		X		N/A
Computer Hardware Maintenance		X		N/A
Copier and Printer Maintenance	X	X		BNL maintains Core Competence on-site services to meet tight schedules while also outsourcing to subcontractors under blanket orders routine maintenance.
Environmental Restoration		X		N/A
Fabrication Support (i.e. machine shops)	X	X		BNL maintains an on-site Core Competence to meet unique requirement and schedules from the scientific staff (i.e. RHIC project) as well outsourcing to subcontractors for routine fabrications.
Job Shoppers*		X		N/A

Make-or-Buy Plan FY 2000
Attachment I

Service/Function	Must Make	Must Buy	Can Make or Buy	Rationale for Make Decision
Laboratory Equipment Maintenance	X	X		BNL maintains a Core Competence on-site service for scientific projects (RHIC, AGS and Light Source) as these experiments run 24 hours and cannot wait for repairs. Also outsourcing to subcontractors for routine and backup support .
Laboratory Services (i.e. employment advertising, information systems)	X	X		BNL maintains a Core Competence on site for public affairs to support interaction with the community. Also BNL outsources advertising for routine activities.
Legal Services	X	X		BNL maintains an on-site Core Competence Legal Staff of two while also outsourcing to subcontractors for special needs such as environmental activities and lawsuits.
R&D Technical Assistance	X	X		BNL is a Research and Development Lab and therefore we must maintains an on-site Core Competence while also outsourcing to subcontractors for additional support such as graduate Students and colleges and university collaborating on R&D projects.
Software Support	X	X		BNL maintains an on-site Core Competence to support the Financial Services Computing (Accounting, Acct payable, Accts receivable, IPAP) and ITD for LAN and workstation for administration and research divisions. Also BNL outsource to subcontractors to augment these two division during peak periods and on special projects (i.e. peoplesoft)

Make-or-Buy Plan FY 2000
Attachment I

Service/Function	Must Make	Must Buy	Can Make or Buy	Rationale for Make Decision
Special Materials and Supplies	X	X		BNL maintains an on-site Core Competence to support warehousing of materials for quick turn around to the lab while also outsourcing to subcontractors under blanket orders and credit cards routine items such office supplies
Telecommunications		X		N/A
Training (i.e. computer software and hardware, quality assurance, reactor operation and maintenance, safeguards and security, personnel development)	X	X		BNL maintains an on-site Core Competence for training in areas such as safety while also outsourcing to subcontractors for unique training such as word processing or peoplesoft.
Management of Environmental Restoration Division		X		N/A
Management of the Waste Management Division		X		N/A
Management of the Reactor Division		X		N/A
Laundry**		X		Make-or-Buy Study
Automobile Fleet Operations**	X			Make-or-Buy Study
Temporary Clerical Support**	X			Make-or-Buy Study
Custodial Services**	X			Make-or-Buy Study
Heavy Equipment Maintenance**	X			Make-or-Buy Study
Packaged Boiler Maintenance**	X			Make-or-Buy Study
Painting**	X			Make-or-Buy Study
Security**	X			Make-or-Buy Study
Travel Office Operations**	X			Make-or-Buy Study
Telecommunications System Management Services**		X		N/A
LAN operations			X	TBD

Make-or-Buy Plan FY 2000
Attachment I

Service/Function	Must Make	Must Buy	Can Make or Buy	Rationale for Make Decision
Desktop operations & Computer Hardware Maintenance***				
Photography Services***			X	TBD

* Represents an activity which is totally subcontracted.
** Represents activities in which a formal report was submitted to DOE-BHG with the rationale for determination
*** Represents function to be evaluated in FY2000

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Brookhaven Science Associates, LLC

ATTACHMENT J.6

APPENDIX F

RESERVED

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.7

APPENDIX G

PURCHASING SYSTEM REQUIREMENTS

Applicable to the Operation of
Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

Appendix G

Purchasing System Requirements

This Appendix and Clause I.114, "Contractor Purchasing System," sets forth DOE requirements applicable to the Purchasing System established under the Contract for the management of Brookhaven National Laboratory.

Subcontracts Not Binding on DOE

As used herein, the term "subcontracts" includes subcontracts, purchase orders, letter agreements, basic ordering agreements, consultant agreements, micro-purchases, EDI and FACNET transactions, and lower tier subcontracts under cost-type subcontracts (in an unbroken cost-type chain) that represent costs properly chargeable to the Prime Contract.

All applicable subcontracts shall be made in the name of Brookhaven Science Associates, LLC shall not bind or purport to bind the Government, shall not relieve the Contractor of any obligation under the Prime Contract (including, among other things, the obligation to properly supervise and coordinate the work of subcontractors), and shall contain such provisions as are required by this Contract or as DOE may prescribe based on Federal statutes and regulations, or DOE Orders and Policies.

DOE Approval

Prior DOE written approval is required for the following actions:

1. Laboratory award of any subcontract having a value of $10,000,000.00 or greater, or any subcontract modification which will cause the value to exceed $10,000,000.00;

2. Except as otherwise expressly provided or directed, in writing, by DOE Patent Counsel with notification to the Contracting Officer, actions which involve any one of, or combination of, the following intellectual property matters:

    a. Acquisition of software by negotiated lease or license;

    b. Purchase of patents or patent license rights, including the payment of royalties and permits, or license fees;

c. Recognition of proprietary rights, including the recognition of technical data as trade secrets; or,

d. Any restriction of DOE's use of data procured under a subcontract.

3. Inter-Contractor Purchases (ICP's) expected to exceed $1,000,000.00.

Laboratory Procurement Policies and Procedures

All additions to, modifications or deletions of, Laboratory Procurement Policies and Procedures shall be submitted to DOE for approval prior to implementation.

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.8

APPENDIX H

FY'03 – SMALL BUSINESS SUBCONTRACTING PLAN

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

SMALL BUSINESS

SUBCONTRACTING PLAN

Identification Data

Contractor: BROOKHAVEN SCIENCE ASSOCIATES, LLC

Address: BROOKHAVEN NATIONAL LABORATORY
Upton, New York 11973-5000

Contract Number: DE-AC02-98CH10886

Item/Service: BASIC RESEARCH

Total Amount of Contract (Including Options): $479,399,000

Period of Contract Performance (DAY, MO. & YR.): FY 2003

1. **Type of Plan (check one)**

__X__ **Individual Contract Plan** - Individual contract Plan, as used in this subpart, means a subcontract plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror's planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purpose may be allocated on a prorated basis to the contract.

____ **Master Plan** - Master Plan, as used in this subpart, means a subcontracting plan that contains all of the required elements of the individual plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approve.

____ **Commercial Products Plan** - Commercial Plan, as used in this subpart, means a subcontracting plan that covers the offeror's fiscal year and that applies to the entire producting of commercial items sold by either the entire company or a portion thereof (e.g., division, plant, or product line). The contractor must provide a copy of the approved plan. **NOTE:** A commercial plan is the preferred the preferred type of subcontracting plan for contractors furnishing commercial items.

2. **Goals**

State separate dollar and percentage goals for small business concerns, small disadvantaged business concerns, women-owned business concerns, veteran-owned small businesses, disabled veteran-owned small businesses, and HUB Zone Small Business Concerns as subcontractors, for the basic and each option year, as specified in FAR 19.704

A. Total estimated dollar value of all planned subcontracting, excluding purchase from government sources, GOCO's, foreign and universities with an approximate value of $40,574,000, is $ 115,300,000.

B. Total estimated dollar value and percent of planned subcontracting with small businesses (includes small disadvantaged businesses, women-owned small businesses, HUB Zone Small businesses veteran-owned small businesses and disabled veteran-owned small businesses): (% of "A")
$ 63,415,000 and 55 %

C. Total estimated dollar value and percent of planned subcontracting with Small Disadvantaged businesses: (% of "A"):

$5,765,000 and 5 %

D. Total estimated dollar value and percent of planned subcontracting with Women-owned small businesses: (% of "A"):

$5,765,000 and 5 %

E. Total estimated dollar value and percent of planned subcontracting with HUB Zone small businesses: (% of "A"):

$3,459,000 and 3 %

F.a. Total estimated dollar value and percent of planned subcontracting with Veteran-owned businesses: (% of "A"):

$1,729,500 and 1.5 %

F.b. Total estimated dollar value and percent of planned subcontracting with Disabled Veteran-owned businesses (% of "A"):

$1,729,500 and 1.5 %

G. Total estimated dollar value and percent of planned subcontracting with LARGE BUSINESS (% of "A"):

$51,885,000 and 45 %.

H. Description of all the products and/or services to be subcontracted under this contract, and the types of businesses supplying them; (i.e., SMALL BUSINESS (SB), SMALL DISADVANTAGED BUSINESS (SDB), WOMEN-OWNED SMALL BUSINESS (WOSB), LARGE BUSINESS (LARGE), HUB ZONE SMALL BUSINESS (HUB ZONE), VETERAN-OWNED SMALL BUSINESSES, DISABLED VETERAN-OWNED SMALL BUSINESSES.

Subcontracted Product/ Service	SB	SDB	WOSB	HUBS	LARGE	VET	DIS/VET
A&E	X	X	X		X	X	X
CONSTRUCTION	X	X	X	X		X	X
R&D	X	X	X		X	X	X
SERVICE	X	X	X	X	X	X	X
MAT'L/SUPPLIES	X	X	X	X	X	X	X
ELECTRICAL	X	X	X	X	X	X	X
ADPE	X	X	X	X	X	X	X
EQUIPMENT (MAJOR)	X	X	X		X	X	X

I. A description of the method used to develop the subcontracting goals for Small business, small disadvantaged business, women-owned small business concerns, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business concerns (i.e., explain the method used and state the quantitative basis (in dollars) used to establish the percentage goals, in addition, how the areas to be subcontracted to small business, small disadvantaged business, women-owned small business concerns, veteran-owned small business concerns, disabled veteran-owned small business and HUB Zone small business concerns were determined, and how the capabilities of small business, small disadvantaged business, women-owned small business, veteran-owned small business/disabled veteran-owned small business, HUB Zone small business concerns were determined – include any source lists used in the determination process).

To develop these goals, small business, SDB, WOSB, HUB Zone and Veterans and Disabled Veterans activity was measured in terms of past annual procurement dollars awarded and the percentage of annual dollars purchased from these small business concerns. The areas selected for award are based on BNL's current vendor base and directories consulted. Directories consulted include: SBA "PRO-NET", "The National Directory of Woman-Owned Business Firms", The Regional Directory of Minority and Woman-Owned Firms and Minority Owned High Tech Businesses, and "The National Minority Business Directory".

J. Indirect costs have been _____ have not been __X__ included in the dollar and percentage subcontracting goals stated above. (check one)

K. If indirect costs have been included, explain the method used to determine the proportionate share of such costs to be allocated as subcontract to small business, small disadvantaged business, women-owned small business concerns, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business concerns.

N/A

3. Program Administrator

Name, title, position within the corporate structure, and duties and responsibilities of the employee who will administer the contractor's subcontracting program.

Name: DENNIS HALL

Title: SMALL & SMALL DISADVANTAGED BUSINESS LIAISON OFFICER

Address: PROCUREMENT & PROPERTY MANAGEMENT DIVISION – BLD. 355
BROOKHAVEN NATIONAL LABORATORY, UPTON, NY 11973-5000

Telephone: 631/344-3173

Duties: has general overall responsibility for the contractor's subcontracting program, i.e., developing, preparing, and executing subcontracting plans and monitoring performance relative to the requirements of this particular plan. These duties include, but are not limited to, the following activities:

A. Developing and promoting company-wide policy initiatives that demonstrate the company's support for awarding contracts and subcontracts to small business, small disadvantaged business, women-owned small business concerns, HUB Zone small business concerns, veteran-owned small business concerns, and disabled veteran-owned small business concerns.

B. Assuring the integrity of supplier information in the Peoplesoft system through a series of controls that include a review of Certifications and Representations, and multi-level approval prior to the addition of a new supplier. Developing electronic controls to ensure certain supplier data such as NAIC code and socio-economic classification, are included when new suppliers are added to the PeopleSoft database.

C. Periodically monitoring the procurement staff and routinely provides new SDB Sources. Though the S/SDBLO is not required to monitor credit card purchases because they are below the micro-purchase threshold of $2,500, the S/SDBLO has developed a SDB Credit Card source list for all credit card holders and periodically adds new sources to this list;

D. Sampling procurements to permit the maximum possible participation of small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business concerns; within purchasing laws and regulations;

E. Randomly reviewing PPM procurements to ensure that they are structured to permit Small and Small Disadvantaged Business concerns to participate to the maximum extent possible. Where applicable, reviewing solicitations to remove statements, clauses, etc, which could restrict or prohibit Small Disadvantaged Business concerns participation;

F. Based on the Buyer/Contract Specialist request, selectively reviewing Proposal Review Board documentation when proposals/bids from any socioeconomic business concerns are not selected for award;

G. Utilizing various sources for the identification of Small Business, Small Disadvantaged Business, Woman-Owned Small Business, HUB Zone Small Businesses, Veteran-owned and Disabled Veteran-owned concerns.

H. Overseeing the establishment and maintenance of contract and subcontract award records;

I. Monitoring the compliance of large business subcontractors subcontracting plans.

J. Preparing, and submitting timely, required subcontract reports;

K. Attending or arranging for the attendance of company counselors at Small Business Opportunity Workshops; Minority and Women Business Enterprise Seminars, Trade Fairs, Procurement Conferences, etc.;

L. Ensuring that small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business concerns are made aware of subcontracting opportunities and how to prepare responsive bids to the Laboratory.

M. Conducting or arranging for training of purchasing personnel regarding the intent and impact of Public Law 95-507 on purchasing procedures.

N. Ensuring that small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veterans-owned small business concerns, and HUB Zone small business concerns are made aware of the BNL Credit Card Program and how to participate in it;

O. Conducting or arranging for training of credit card holders regarding the intent and impact of Public Law 95-507 and the placing of credit card orders with small socio-economically disadvantaged contractors.

P. Coordinating the Laboratory's activities during the conduct of compliance reviews by Federal agencies;

Q. As an adjunct to this plan, the Human Resources Division does conduct recruitment and apprenticeship initiatives with Historically Black Colleges, Universities, and minority institutions.

4. Equitable Opportunity

The contractor agrees to ensure that small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business concerns will have an equitable opportunity to compete for subcontracts. The various efforts include, but are not limited to, the following activities:

A. Outreach efforts to obtain sources:

(i) Contacting small, small disadvantaged, women-owned small business, HUB Zone small business, veteran and disabled veteran-owned small business concerns trade associations.

Buyers are encouraged to use directories provided by the SBA "PRO-NET, The National Directory of Woman-Owned Business Firms, The Government and Industry Advocates for Small Business, The Regional Directory of Minority and Woman-Owned Firms and Minority Owned High Tech Businesses.

(ii) Contacting small business development organizations (identifying small business development organizations).

The Small Business Administration, The Government and Industry Advocates for Small Business, The L.I. Development Corp., The National Minority Purchasing Council, the NYS Small Business Development Center, The Office of Minority Business Administration.

(iii) Attending small, small disadvantaged (minority), women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business procurement conference and trade fairs (to the extent known, identifying specific procurement conferences and trade fairs and dates).

- Suffolk County Women's Initiative Trade Fair & Conference,
- DOE S/SDB Semi-annual Conference
- BNL Credit Card/Small Business Matchmaker Event
- The Government and Industry Advocates for Small Business Trade Fair
- The LI Hispanic Chamber of Commerce Roundtable Procurement Conference

(iv) Potential sources will be requested from SBA's PRO-NET System.

(v) Utilizing the Internet to attract new sources.

B. Internal efforts to guide and encourage purchasing personnel;

(i) Presenting workshops, seminars, and training programs including training on the use of PRO-NET;

(ii) Establishing, maintaining, and using small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business source lists, guides, and other data for soliciting subcontracts; and

(iii) Monitoring activities to evaluate compliance with the subcontracting plan.

(iv) Trip reports will be issued to management after attendance at each function. Also, if attendance results in the discovery of potential new sources, the

SDBLO will issue a memo to the cognizant buyer/contracts specialist(s) stating the firm, the commodity and a directive to utilize the firm and if not, the reason(s) why not. Responses will be required within 90 days. The SDBLO will monitor responses.

C. Outreach Events

(i) The Second Annual Small Disadvantaged Business Vendor Products Demonstration Exhibit for Credit Cardholders will be held in January 2003. This event is intended as a matchmaking function between cardholders and socially disadvantaged businesses. The S/SDBLO will coordinate this event, assisted by the Credit Card Administrator for the Laboratory. Presentations and information networking will be performed by the selected small disadvantaged businesses. BNL's cardholders will interact and receive valuable product information with these selected sources.

(ii) April 2003 – The S/SDBLO will host Brookhaven's 9th Biennial Small Disadvantaged Business Conference Fair. Over 100 small suppliers are expected to attend. The objective of the Fair is to promote and maintain a supportive relationship with the small business entrepreneurs and give them every opportunity to meet the Laboratory's diverse requirements for supplies and services. In addition to representatives from the Laboratory's departments and divisions, other government and local agencies also participate in this event. Traditionally, the congressional representative of BNL's district has presented BNL's Small Business Awards.

(iii) S/SDBLO will continue to co-chair the "Government & Industry Advocates for Small Business". This is a group of L.I. based agencies along with the SBA that was formed by the S/SDBLO in July 2000, who have joined efforts in promoting small business opportunities.

This group of corporate small business advocators has assembled as one to construct and formulate new methods and creative ideas in the advancement of all socioeconomic business concerns. This committee initially began with six (6) members and has now grown to a membership of thirty (30) diverse agencies.

D. Additional efforts:_____

- Credit Card User training regarding SDBs as part of standard Credit Card Training.
- Education courses – Buyers, Specialists, SDBLO.
- A Home Page section devoted to Small Business affairs.
- Internal Procurement Planning for Depts. (set-asides).
- "Partnering" arrangements between Large and SDB firms.
- Establishment of Individual and Section Goals: Each Buyer/Contract Specialist is expected to individually meet the Laboratory's S/SDB/WOSB/Hub/ Veteran/Disabled Veteran goal for the year. Also, each section of PPM, is expected to meet this goal on a cumulative basis. This will be made part of each Buyer/Contracts Specialist's appraisal.

- Incentive Awards: A "Minority Buyer of the Year" program has been established to recognize those Buyers/Contract Specialists who best meet the objectives of BNL's SDB Program.

E. Utilization of the New York State Small Business Development Center (SBDC):

(i) The S/SDBLO and SBDC representative will meet on a monthly basis to discuss new small businesses who may have the potential to satisfy some of BNL's procurement requirements.

(ii) The S/SDBLO and SBDC representative will be active in the development of new and creative ideas and methods exploring the utilization of the socioeconomic groups to their fullest extent.

(iii) The SBDC representative will team with BNL's S/SDBLO on future Long Island based outreach small business fairs, conferences, seminars, etc. This will allow the SDBC representative to familiarize himself with the various small businesses and to introduce his expertise to the small business community.

5. Flow-Down Clause

The contractor agrees to include the provisions under FAR 52.219-8, "Utilization of Small Business Concerns," in all sub-contracts that offer further subcontracting opportunities. All subcontractors, except small business concerns, that receive subcontracts in excess of $500,000 ($1,000,000 for construction) must adopt and comply with a plan similar to the plan required by FAR 52.219-9 "Small Business Subcontracting Plan." (FAR 19.704 (a) (4)).

Such plans will be reviewed by comparing them with the provisions of Public Law 95-507, and assuring that all minimum requirements of an acceptable subcontracting plan have been satisfied. The acceptability of percentage goals shall be determined on a case-by-case basis depending on the supplies/services involved, the availability of potential small, small disadvantaged, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business subcontractors, and prior experience. Once approved and implemented, plans will be monitored through the submission of periodic reports, and/or, as time and availability of funds permit, periodic visits to subcontractors facilities to review applicable records and subcontracting program progress.

6. Reporting and Cooperation

The contractor gives assurance of (1) cooperation in any studies or surveys that may be required by the contracting agency or the Small Business Administration; (2) submission of periodic reports such as utilization reports, which show compliance with the subcontracting plan; (3) submission of Standard Form (SF) 294, "Subcontracting Report for Individual Contracts," and SF 295, "Summary Subcontract Report," in accordance with the instructions on the forms; and (4) ensuring that large business subcontractors with subcontracting plans agree to submit Standard Forms 294 and 295.

Reporting Period	Report Due	Due Date
Oct 1 – March 31	SF-294	04/30
Apr 1 – Sept 30	SF-294	10/31
Oct 1 – Sept 30	SF-295	10/31
Oct 1 – Sept 30	Forecast Opportunities	10/31

7. Record keeping

The following is a recitation of the types of records the contractor will maintain to demonstrate the procedures adopted to comply with the requirements and goals in the subcontracting plan. These records will include, but not be limited to, the following:

A. If the prime contractor is not using PRO-NET as its source for small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns and HUB Zone small business concerns, list the names of guides and other data identifying such vendors;

B. Organizations contacted in an attempt to locate small business, small disadvantaged business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns, HUB Zone small business sources;

C. Records to support other outreach efforts, e.g., contacts with minority, small business, women-owned small business, veteran-owned small business concerns, disabled veteran-owned small business concerns, HUB Zone small business trade associations, attendance at small business, minority, women-owned small business procurement conferences and trade fairs;

D. Records to support internal guidance and encouragement, provided to buyers through
(1) workshops, seminars, training programs, incentive awards;
(2) monitoring of activities to evaluate compliance;

E. On a contract-by-contract basis, records to support subcontract award data including the name, address and business size of each subcontractor. (This item is not required for company or division-wide commercial products plans.)

F. The S/SDBLO will maintain electronically, through the PeopleSoft system, a list of SBA "PRO-NET" certified SDBs and HUBZone firms. The company name must appear on this list and gain approval from the S/SDBLO before being placed in the PeopleSoft database as a socioeconomically disadvantaged firm.

G. All new vendors regardless of their classification will require "Representations and Certifications". This also will be electronically driven and maintained through PeopleSoft.

This subcontracting plan was submitted by:

Signature: Brian P. Sack

Typed Name: Brian P. Sack

Title: Assistant Laboratory Director
Finance & Administration

Date Prepared: 9/24/02

Phone No.: 631-344-3317

Approval:

Signature: Robert P. Gordon

Typed Name: ROBERT P. GORDON
CONTRACTING OFFICER

Title:

Date Prepared: 12/2/02

Phone No.: (631) 344-3346

#G:\Staff\Hall\#F-Simpson\WP61Misc\SDBSUBFY2002\8/02

ATTACHMENT 1

A. The estimated total dollars available in the Laboratory's FY 2003 budget (based on current BNL budget projections) are as follows:

Operating Funds.....$435,270,000
Equipment Funds.....$ 25,916,000
General Plant Projects.....$ 6,120,000
Major Construction Projects.....$ 12,093,000

TOTAL.....$ 479,399,000

B. The estimated total dollars available for procurement are as follows:

Operating Funds.....$129,908,000
Equipment Funds.....$ 16,100,000
General Plant Projects.....$ 3,256,000
Major Construction Projects.....$ 6,610,000

TOTAL.....$155,874,000 (less $40,574,000 from government, GOCO's, foreign and universities for a subcontracting base of $115,300,000)

C. Present indications are that the dollars available for Procurement next year may be broken down further into the following categories:

1. Operating Funds
   a. Materials & Supplies.....$64,358,000
   b. Purchased Labor.....$48,953,000
   c. Stockroom.....$16,597,000

OPERATING SUBTOTAL.....$129,908,000

2. Equipment Funds.....$16,100,000
3. General Plant Projects.....$ 3,256,000
4. Major Construction Projects.....$ 6,610,000

TOTAL.....$155,874,000 (less $40,574,000 from government, GOCO's, foreign and universities for a subcontracting base of $115,300,000)

D. After reduction of purchases from government sources, GOCO's, foreign and universities with an approximate value of $40,574,000, the Laboratory plans to place approximately 55% of its remaining procurement dollars ($63,415,000) with small businesses, roughly as follows:

a. Socio-economically Disadvantaged Business.....5%
($5,765,000)
b. Small Business Set-Aside.....39%
($44,967,000)
c. Women Owned Small Business.....5%
($5,765,000)
d. Hub-Zone Small Business.....3%
($3,459,000)
e. Veteran Owned Small Business.....1.5%
($1,729,500)
f. Disabled Veteran-Owed Small Business.....1.5%
($1,729,500)

TOTAL.....55%
($63,415,000)

g. Records to support other outreach efforts: Contact with Disadvantaged (Minority) and Small Business Trade Associates, etc. Attendance at small and minority business procurement conferences and trade fairs.

h. Records to support internal activities to guide and encourage buyers: Workshops, Seminars, Training programs, etc. Monitoring activities to Evaluate compliance.

i. On a contract-by-contract basis, records to support subcontract award data to include name and address of subcontracts.

	Prior Year Goals Through Sept. 30, 2002	**Prior Year Achievements Through Sept. 30, 2002***
Total Subcontract dollars	$ 144,214,000	T B D
Small Business dollars	79,317,700	T B D
Small Business percent	55%	T B D
Small Disadvantaged dollars	7,210,700	T B D
Small Disadvantaged percent	5%	T B D
Small Woman Owned dollars	7,210,700	T B D
Small Woman Owned percent	5%	T B D
Hub Zone dollars	2,884,280	T B D
Hub Zone percent	2%	T B D
Small Veteran-Owned dollars	2,163,210	T B D
Small Veteran-Owned percent	1.5%	T B D
Small Disabled Veteran-Owned dollars	2,163,210	T B D
Small Disabled Veteran-Owned percent	1.5%	T B D

*Excludes purchases from government sources, GOCO's, Foreign and Universities which amounted to $ T B D

Appendix I
Modification No. M090
Supplemental Agreement to
Contract No. DE-AC02-98CH10886

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.9

APPENDIX I

DOE DIRECTIVES/LIST B

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

APPENDIX I

DOE DIRECTIVES

There is no List A to this Appendix.

List B to this Appendix contains two parts as follows:

Part I: "Directives List"

This section contains a list of Directives that are considered by DOE as applicable to the BNL contract.

Part II: "Partial Deletions of Directives"

This section contains a list of Directives that were accepted and implemented by the previous contractor but have subsequently been revised by DOE to remove certain sections.

Appendix I - Part I

CRD=Contract Requirements Document

DIRECTIVES LIST		
DATE	**DOE DIRECTIVE NUMBER**	**SUBJECT TITLE**
7/14/99	N 142.1	UNCLASSIFIED FOREIGN VISITS AND ASSIGNMENTS (Extended until 8/15/02 by DOE N 251.43 dated 2/15/02)
2/26/01	N 153.1	CONNECTIVITY TO ATMOSPHERIC RELEASE ADVISORY CAPABILITY
10/02/00	N 203.1	CRD - SOFTWARE QUALITY ASSURANCE (Extended until 12/31/01 by DOE N 251.40 dated 5/3/01)
7/26/99	N 205.1	CRD - UNCLASSIFIED CYBER SECURITY PROGRAM (Extended until 12/31/02 by DOE N 251.44 dated 5/6/02)
11/1/99	N 205.2	CRD - FOREIGN NATIONAL ACCESS TO DOE CYBER SYSTEMS (Extended until 12/31/02 by DOE N 251.44 dated 5/6/02)
11/23/99	N 205.3	CRD - PASSWORD GENERATION, PROTECTION, AND USE (Extended until 12/31/02 by DOE N 251.44 dated 5/6/02)
3/18/02	N 205.4	CRD - HANDLING CYBER SECURITY ALERTS AND ADVISORIES AND REPORTING CYBER SECURITY INCIDENTS
1/12/01	N 350.6	CRD - ACCEPTANCE OF VALID WORKERS' COMPENSATION CLAIMS
7/15/97	N 440.1	CRD - INTERIM CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM
9/30/95	N 441.1	RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES (using ORNL/TM-11497 in lieu of Attachment 1)(Extended until 6/30/00 by DOE N 441.4 dated 11/20/98)
2/5/01	N 450.4	CRD - ASSIGNMENT OF RESPONSIBILITIES FOR EXECUTIVE ORDER 13148, GREENING THE GOVERNMENT THROUGH LEADERSHIP IN ENVIRONMENTAL MANAGEMENT (Extended until 9/1/02 by DOE N 450.5, dated 8/24/01)
10/17/01	N 450.7	CRD - THE SAFE HANDLING, TRANSFER, AND RECEIPT OF BIOLOGICAL ETIOLOGIC AGENTS AT DOE FACILITIES (Extended until 12/30/02 by DOE N 450.8 dated 6/11/02)
12/15/00	N 470.2	CRD - REPORTING UNOFFICIAL FOREIGN TRAVEL (Extended until 12/31/01 by DOE N 251.40 dated 5/3/01)
4/13/01	N 471.3	CRD - REPORTING INCIDENTS OF SECURITY CONCERN (Extended until 12/31/02 by DOE N 251.44 dated 5/6/02)
5/26/00	N 473.4	CRD - DEPARTMENT OF ENERGY BADGES (Extended until 12/31/01 by DOE N 251.40 dated 5/3/01)
6/5/00	N 473.5	CRD - SECURITY AREA VOUCHING AND PIGGYBACKING (Extended until 12/31/01 by DOE N 251.40 dated 5/3/01)
9/18/00	N 473.6	CRD - SECURITY CONDITIONS (Extended until 12/31/02 by DOE N 251.44 dated 5/6/02)
10/26/00	N 473.7	CRD - EXPLOSIVE DETECTION PROGRAM (Extended until 12/31/01 by DOE N 251.40 dated 5/3/01)
11/3/99	O 110.3	CRD - CONFERENCE MANAGEMENT
9/29/95	O 130.1	CRD - BUDGET FORMULATION PROCESS (Extended until 5/1/03 by DOE N 251.45 dated 5/29/02)
9/30/95	O 135.1	BUDGET EXECUTION-FUNDS DISTRIBUTION AND CONTROL (Extended until 5/1/03 by DOE N 251.45 dated 5/29/02)
11/01/00	O 151.1A	CRD - COMPREHENSIVE EMERGENCY MANAGEMENT SYSTEM

*See Part II, Partial Deletions

DIRECTIVES LIST		
DATE	**DOE DIRECTIVE NUMBER**	**SUBJECT TITLE**
9/30/96	O 200.1	CRD - INFORMATION MANAGEMENT PROGRAM
9/27/95 10/26/95 5/1/95	O 210.1 Change 1 Change 2	CRD - PERFORMANCE INDICATORS AND ANALYSIS OF OPERATIONS INFORMATION
3/22/01	O 221.1	CRD - REPORTING FRAUD, WASTE, AND ABUSE TO THE OFFICE OF INSPECTOR GENERAL
3/22/01	O 221.2	CRD - COOPERATION WITH THE OFFICE OF INSPECTOR GENERAL
12/8/97	O 224.1	CRD - CONTRACTOR PERFORMANCE-BASED BUSINESS MANAGEMENT PROCESS
11/26/97	O 225.1A	CRD - TYPE A AND B ACCIDENT INVESTIGATIONS
9/30/95 10/26/95 11/7/96	O 231.1 Change 1 Change 2	CRD - ENVIRONMENT, SAFETY & HEALTH REPORTING CANCELLATION - ES&H Reporting, dated 11/7/96, Paragraph 5b(2).
9/30/95 11/7/96 Change 1 01/28/00 Change 2	M 231.1-1	ENVIRONMENT, SAFETY, AND HEALTH REPORTING MANUAL CANCELLATION - ES&H Reporting Manual, dated 11/7/96, Chapter IV. (Paragraphs 2a, 2a(1), 2a(2), 2b(1) 2b(2), 2i(3)(a) through 2i(3)(d) of Chapter II and Appendix A Cancelled by DOE N 231.1 dated 1/15/02)
8/1/97	O 232.1A	CRD - OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION (As modified by letter Grahn/Gordon, dated 4/10/98, effective 5/5/98)
7/21/97	M 232.1-1A	OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION (As modified by letter Grahn/Gordon, dated 4/10/98, effective 5/5/98)
4/9/01	O 241.1A	CRD - SCIENTIFIC AND TECHNICAL INFORMATION MANAGEMENT
1/30/98	O 251.1A	CRD - DIRECTIVES SYSTEM
11/19/99	O 252.1	CRD - TECHNICAL STANDARDS PROGRAM
12/30/96	O 311.1A	CRD - EQUAL EMPLOYMENT OPPORTUNITY AND DIVERSITY PROGRAM (Extended until 12/30/02 by DOE N 311.2 DATED 5/29/02)
9/30/96 5/8/98	O 350.1 Change 1	CRD - CONTRACTOR HUMAN RESOURCE MANAGEMENT PROGRAMS CRD - EMPLOYEE BENEFITS
7/12/01	O 350.2	CRD - USE OF FACILITY CONTRACTOR EMPLOYEES FOR SERVICES TO DOE IN THE WASHINGTON, D.C., AREA
4/18/02	O 413.1A	CRD - MANAGEMENT CONTROL PROGRAM
1/08/01	O 413.2A	CRD - LABORATORY DIRECTED RESEARCH AND DEVELOPMENT
10/13/00	O 413.3	CRD - PROGRAM AND PROJECT MANAGEMENT FOR THE ACQUISITION OF CAPITAL ASSETS
11/24/98	O 414.1	CRD - QUALITY ASSURANCE
5/20/02	O 420.1A	CRD - FACILITY SAFETY
1/08/01	O 420.2A	CRD - SAFETY OF ACCELERATOR FACILITIES
12/21/00	O 425.1B	CRD - STARTUP AND RESTART OF NUCLEAR FACILITIES

DIRECTIVES LIST		
DATE	**DOE DIRECTIVE NUMBER**	**SUBJECT TITLE**
10/14/98	O 430.1A	CRD - LIFE CYCLE ASSET MANAGEMENT (DOE O 430.2A, dated 4/15/02, cancels Paragraphs 6d(2), 6h, 7b(1), 7b(2), and 7e(16).)
4/15/02	O 430.2A	CRD - DEPARTMENTAL ENERGY AND UTILITIES MANAGEMENT
6/01/01	O 433.1	CRD - MAINTENANCE MANAGEMENT PROGRAM FOR DOE NUCLEAR FACILITIES
7/9/99 8/28/01	O 435.1 Change 1	CRD - RADIOACTIVE WASTE MANAGEMENT
7/9/99 6/19/01	M 435.1-1 Change 1	RADIOACTIVE WASTE MANAGEMENT MANUAL
3/27/98	O 440.1A	CRD - WORKER PROTECTION MANAGEMENT FOR DOE CONTRACTOR EMPLOYEES
3/8/02	O 440.2A	CRD - AVIATION MANAGEMENT AND SAFETY
6/6/01	O 442.1A	CRD - DEPARTMENT OF ENERGY EMPLOYEE CONCERNS PRG.
5/15/00	O 443.1	PROTECTION OF HUMAN SUBJECTS
10/26/00 9/28/01	O 451.1B Change 1	NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE PROGRAM
10/2/96	O 460.1A	CRD - PACKAGING AND TRANSPORTATION SAFETY
9/27/95 10/26/95	O 460.2 Change 1	CRD - DEPARTMENTAL MATERIALS TRANSPORTATION AND PACKAGING MANAGEMENT
9/28/95 6/21/95	O 470.1 Change 1	CRD - CONTRACTOR SAFEGUARDS AND SECURITY PROGRAM REQUIREMENTS (Extended until 8/15/02 by DOE N 251.43 dated 2/15/02)
03/01/00	O 470.2A	CRD - SECURITY AND EMERGENCY MANAGEMENT INDEPENDENT OVERSIGHT AND PERFORMANCE ASSURANCE PROGRAM
6/30/00	O 471.1A	CRD - IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION
6/30/00 10/23/01	M 471.1-1 Change 1	IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION MANUAL
3/27/97	O 471.2A	CRD - INFORMATION SECURITY PROGRAM (Extended until 8/15/02 by DOE N 251.43, dated 2/15/02)
1/6/99	M 471.2-1B	CRD - CLASSIFIED MATTER PROTECTION AND CONTROL MANUAL
8/3/99	M 471.2-2	CRD - CLASSIFIED INFORMATION SYSTEMS SECURITY MANUAL (DOE N 205.3, dated 11/23/99 cancel Paragraphs 4j(2) and 4j(6) of Chapter VI, and Paragraph 12a(2)(a) of Chapter VII.) (Notice 205.4 dated 3/18/02 cancels Chapter III Section 8)
3/24/97	O 472.1B	CRD - PERSONNEL SECURITY ACTIVITIES (Extended until 8/15/02 by DOE N 251.43 dated 2/15/02)
7/12/01	M 472.1-1B	PERSONNEL SECURITY PROGRAM MANUAL
6/30/00	O 473.2	CRD - PROTECTIVE FORCE PROGRAM
1/17/02	M 473.2-1A	FIREARMS QUALIFICATION COURSES MANUAL
6/30/00 12/20/01	M 473.2-2 Change 1	PROTECTIVE FORCE PROGRAM MANUAL
11/20/00	O 474.1A	CRD - CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS

DIRECTIVES LIST		
DATE	**DOE DIRECTIVE NUMBER**	**SUBJECT TITLE**
11/22/00	M 474.1-1A	CRD - MANUAL FOR CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS
5/8/98	M 475.1-1	CRD - IDENTIFYING CLASSIFIED INFORMATION
9/28/01	O 481.1B	CRD - WORK FOR OTHERS (NON DOE FUNDED WORK)
1/03/01 9/28/01	M 481.1-1A Change 1	REIMBURSABLE WORK FOR NON-FEDERAL SPONSORED PROCESS MANUAL
1/12/01	O 482.1	CRD - DOE FACILITIES TECHNOLOGY PARTNERING PROGRAMS
1/12/01	O 483.1	CRD - DOE COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS
1/12/01	M 483.1-1	DOE COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS
7/05/01	O 534.1A	CRD - ACCOUNTING
8/25/00	O 551.1A	CRD - OFFICIAL FOREIGN TRAVEL
7/12/00	M 573.1-1	MAIL SERVICES USER'S MANUAL
5/2/01	P 141.1	DEPARTMENT OF ENERGY MANAGEMENT OF CULTURAL RESOURCES
6/10/00	P 413.1	PROGRAM AND PROJECT MANAGEMENT POLICY FOR THE PLANNING, PROGRAMMING, BUDGETING, AND ACQUISITION OF CAPITAL ASSETS
5/08/01	P 470.1	INTEGRATED SAFEGUARDS AND SECURITY MANAGEMENT POLICY
5/20/02	P 580.1	MANAGEMENT POLICY FOR PLANNING, PROGRAMMING, BUDGETING, OPERATION, MAINTENANCE AND DISPOSAL OF REAL PROPERTY
6/23/92	1270.2B	SAFEGUARDS AGREEMENT WITH THE INTERNATIONAL ATOMIMC ENERGY AGENCY
1/17/93	2100.8A	COST ACCOUNTING, COST RECOVERY INTERAGENCY SHARING OF INFORMATION FACILITIES
7/14/88 10/5/88 5/18/92	2110.1A Change 1 Change 2	PRICING OF DEPARTMENTAL MATERIALS AND SERVICES
6/8/92	2300.1B	AUDIT RESOLUTION AND FOLLOWUP
2/10/94	4330.4B	MAINTENANCE MANAGEMENT PROGRAM (Nuclear Facilities Portion Only) (O 433.1 Cancels 4330.4b, Chapter II)
11/9/88 6/29/90	5400.1* Change 1	GENERAL ENVIRONMENTAL PROTECTION PROGRAM
2/8/90 6/5/90 1/7/93	5400.5* Change 1 Change 2	RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT
5/15/84 5/16/88 5/16/89 9/20/91	5480.4* Change 1 Change 2 Change 3	ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION STANDARDS
7/9/90	5480.19	CONDUCT OF OPERATIONS REQUIREMENTS FOR DOE

DIRECTIVES LIST		
DATE	**DOE DIRECTIVE NUMBER**	**SUBJECT TITLE**
5/18/92 10/23/01	Change 1 Change 2	FACILITIES
11/15/94	5480.20A	PERSONNEL SELECTION, QUALIFICATION AND TRAINING REQUIREMENTS FOR DOE NUCLEAR FACILITIES
1/19/93	5480.30	NUCLEAR REACTOR SAFETY DESIGN CRITERIA
9/20/91	5530.1A	ACCIDENT RESPONSE GROUP
1/14/92 4/10/92	5530.3 Change 1	RADIOLOGICAL ASSISTANCE PROGRAM
5/8/85	5560.1A	PRIORITIES AND ALLOCATIONS PROGRAM
8/1/80	5610.2	CONTROL OF WEAPON DATA
7/15/94	5632.1C*	PROTECTION AND CONTROL OF SAFEGUARDS AND SECURITY INTERESTS
5/26/94	5660.1B	MANAGEMENT OF NUCLEAR MATERIALS
9/4/92	5670.3	COUNTERINTELLIGENCE PROGRAM
5/18/92	5700.7C	WORK AUTHORIZATION SYSTEM

ACCOUNTING PRACTICES AND PROCEDURES HANDBOOK		
5/2/83	Chapter V	INVENTORIES
6/30/80	Chapter X	PRODUCT COST ACCOUNTING

Appendix I - Part II

PARTIAL DELETIONS OF DIRECTIVES				
DATE	**DOE DIRECTIVE NUMBER**	**SUBJECT TITLE**	**DELETION DIRECTIVE DATE**	**SECTIONS DELETED**
11/9/88 6/29/90	5400.1 Change 1	GENERAL ENVIRONMENTAL PROTECTION PROGRAM	O 231.1 9/30/95 Change 1 10/26/95 Change 2 11/7/96	Paras. 2d, 2b, 4b & 4c of Chap II; Paras 2d & 3b of Chap III; Para 10(c) of Chap IV
2/8/90 6/5/90 1/7/93	5400.5 Change 1 Change 2	RADIATION PROTECTION OF THE PUBLIC AND THE ENVIRONMENT	O 231.1 9/30/95 Change 1 10/26/95	Chapter II: Para 1a(3) (a)
5/15/84 5/16/88 5/16/89 9/20/91	5480.4 Change 1 Change 2 Change 3	ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION STANDARDS	O 440.1 9/30/95 Change 1 10/26/95	Attachment 2: Paras 2c, 2d(2) - (3), 2e(1) - (8); and Attach. 3: Paras 2c,; 2d(2) - (3), 2e(1) - (7)
7/15/94	M5632.1C-1	MANUAL FOR PROTECTION AND CONTROL OF SAFEGUARDS AND SECURITY INTERESTS	O 470.1 9/28/95 O 471.2A 3/27/97	Chapter XI Chapter III, Paras 1, 2, 4-9

*See Part II, Partial Deletions

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.10

APPENDIX J

TREATIES AND INTERNATIONAL AGREEMENTS/WAIVED INVENTIONS

Applicable to the Operation of The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

UNITED STATES DEPARTMENT OF ENERGY
AGREEMENT LISTING

Expiration Date	DOE Office	Title
1-6-97; exec 1-6-92	PO	Agreement relating to scientific and technical cooperation between the Government of the United States of America and the Government of the Republic of Korea.
7-6-99; exec 7-6-94	IA and Department of State	Agreement between the Government of the United States of America and the Government of Estonia on science and technology cooperation.
7-6-99; exec 7-6-94	IA and Department of State	Agreement between the Government of the United States of America and the Government of Latvia on science and technology cooperation.
7-6-99; exec 7-6-94	IA and Department of State	Agreement between the Government of the United States of America and the Government of the Republic of Lithuania on science and technology cooperation.
		Arrangement for the Exchange of Technical Information and for Cooperation in the Field of Peaceful uses of nuclear energy between the Atomic Energy Office for Peace and the U.S. National Laboratory.
Exec 1-15-92		Agreement between the Government of the Republic of Indonesia and the Government of the United States of America for cooperation in scientific research and technology development.
Exec 6-14-96		Memorandum of Understanding between the Department of Energy of the United States of America and the Ministry of Science and Technology of the Republic of Korea for a cooperative laboratory relationship.
Exec 12-11-96		Agreement between the Department of Energy and the Nuclear Power Engineering Corporation of Japan for cooperation in the field of research and development of light water reactor-associated technologies.

DEPARTMENT OF ENERGY RESEARCH AND DEVELOPMENT BILATERIAL AGREEMENTS
ALL ACTIVE AGREEMENTS

Index	Start/End Dates	Country	Type	Principal Subjects
18	12/20/74 6/31/91 Extending	Germany	Umbrella	Radioactive Waste Management
	6/3/75 6/1/92 Renegotiating	Italy		Geothermal Research and Development
31	9/29/77 None	Germany	Letter	Nuclear Materials Safeguards/Physical Security
38	1/31/79 None	China	Project	High Energy Physics
39	1/31/79 7/31/00	Japan (PNC)	Umbrella	Fast Breeder Reactors
41	2/16/79 None	Mexico	Intergovern-Mental	Science and Technology
42	5/2/79 2/1/00	Japan	Intergovern-mental	Energy and Related Fields
46	6/4/79 12/4/94 Renegotiating	Canada	Umbrella	Tar Sands and Heavy Oil
47	6/4/79 12/4/94 Renegotiating	Canada	Project I Under #46	Resource Characterization of Tar Sands
48	8/24/79 2/1/95	Japan	Project Under #42	Fusion Energy/Coordinating Committee
50	8/28/79 8/28/96	Japan (JAERI)	Project Under #42/48	Fusion Energy/Doublet III
58	11/11/79 2/1/95	Japan	Project Under #42	High Energy Physics
64	3/6/80 9/8/98	Venezuela	Umbrella	Energy R&D
73	7/10/80 9/8/98	Venezuela	Project I Under #64	Heavy Crude Characterization
74	7/10/80	Venezuela	Project II Under	Enhanced Oil Recovery

Index	Start/End Dates	Country	Type	Principal Subjects
	9/8/98		#64	Supporting Research
75	7/10/80 9/8/98	Venezuela	Project III Under #64	Enhanced Oil Recovery Evaluation
76	7/23/80 None	Nigeria	Statement of Intent	Energy R&D
81	9/9/80 9/9/95 Renegotiating	Sweden	Umbrella	Radioactive Waste Management
82	9/29/80 9/8/98	Venezuela	Project IV Under #64	Enhanced Oil Recovery Thermal Processes
86	11/6/80 10/23/95	Finland	Umbrella	Energy R&D
87	1/19/81 1/19/94 Renegotiating	Belgium	Umbrella	Radioactive Waste Management
90	9/30/81 2/1/95	Japan	Project Under #42	Photosynthesis
94	11/6/81 10/25/99	South Korea	Umbrella (A)	Conservation
95	11/6/81 10/25/99	South Korea	Umbrella (B)	Solar Energy
96	11/6/81 6/13/99	South Korea	Umbrella (C)	Coal R&D
97	1/28/82 1/6/00 Renegotiating as to IPRs	European Union	Umbrella	Nuclear Materials Safeguards
100	2/5/82 9/8/98	Venezuela	Project VIII Under #64	Coal Preparation and Combustion
107	8/25/82 8/25/96 Renegotiating	Canada	Umbrella	Radioactive Waste Management
108	9/13/82	Canada	Project II Under	Steam Flooding with Additive in

Index	Start/End Dates	Country	Type	Principal Subjects
	12/4/94 Renegotiating		#46	Tar Sands
109	9/13/82 12/4/94 Renegotiating	Canada	Project III Under #46	Information Dissemination in Tar Sands
110	10/6/82 10/6/92 Renegotiating	European Union	Umbrella	Radioative Waste Management
113	12/17/82 None	European Union	Letter	Renewables
114	1/24/83 2/1/95	Japan	Intergovernment al Under #42	Fusion Energy
115	1/25/83 2/1/95	Japan (Monbusho)	Letter Under #114	Fusion Energy
116	1/25/83 2/1/95	Japan (MITI)	Letter Under #114	Fusion Energy
117	1/25/83 2/1/95	Japan (STA)	Letter Under #114	Fusion Energy
122	4/22/83 4/22/89 Renegotiating	France	Umbrella	Physical Protection of Nuclear Materials
123	5/11/83 4/30/96	China	Project	Nuclear Physics and Magnetic Fusion
132	10/27/83 None	France	Statement of Intent	Radioactive Waste Management - West Valley
134	11/8/83 2/1/95	Japan (JAERI)	Project Under #114	Fusion Energy
137	3/14/84 9/8/98	Venezuela	Project X Under #64	Training of Petroleum Engineers
140	4/26/84 6/20/98	Japan	Project Under #249	Electric Field Effects
141	5/26/84	Brazil	Umbrella	Coal Technology

DEPARTMENT OF ENERGY RESEARCH AND DEVELOPMENT BILATERIAL AGREEMENTS
ALL ACTIVE AGREEMENTS

Index	Start/End Dates	Country	Type	Principal Subjects
	None			
157	4/16/85 5/22/96	China	Project	Fossil Energy R&D
158	4/19/85 9/23/96	Switzerland	Umbrella	Radioactive Waste Management
159	5/14/85 6/11/00	United Kingdom	Project Under #278	Energy-Related Information
160	5/31/85 2/28/91 Renegotiating	France	Umbrella	National Nuclear Material Accounting/Control
168	11/15/85 3/31/97	Japan (PNC)	Project Under #39	LMR Fuels and Materials
171	12/12/85 None	Spain	Umbrella	Science and Technology
175	2/28/86 12/4/94 Renegotiating	Canada	Project IV Under #46	Monitoring Frontal Movements in Thermal Recovery
176	3/13/86 4/30/96	China	Project Under #123	IPR/Nuclear Physics and Magnetic Fusion
180	4/7/86 4/7/94 Renegotiating	Mexico	Umbrella	Geothermal
182	5/19/86 2/1/95	Japan	Project Under #42	Coal R&D
185	6/20/86 None	France	Statement of Intent	Low-Level Radioactive Waste
186	6/20/86 5/31/92 Renegotiating	France	Umbrella	Nuclear Criticality Safety Information
192	11/10/86 2/1/95	Japan	Project Under #114	Fuel Cleanup System at TSTA
195	12/3/86	Japan	Umbrella	Radioactive Waste Management

DEPARTMENT OF ENERGY RESEARCH AND DEVELOPMENT BILATERIAL AGREEMENTS
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Index	Start/End Dates	Country	Type	Principal Subjects
	12/3/96			
196	12/4/86 12/4/96	Canada	Umbrella	Energy R&D
197	12/15/86 12/15/96	European Union	Umbrella	Magnetic Fusion
198	12/24/86 12/24/96	Canada	Project I Under #196	IPR/Information/Personnel Exchange
199	2/4/87 2/13/95	Saudi Arabia	Umbrella	Renewable Energy R&D
203	5/5/87 12/31/91 Renegotiating	European Union	Project Under #197	JET Pellet Fueling
204	5/6/87 5/7/97	European Union	Project Under #197	Tore Supra (CEA)
210	6/11/87 6/11/94	Japan (JAERI)	Project Under #134	Fusion - Fuel Processing
214	7/20/87 7/19/95	Japan (Monbusho)	Project Under #115	Irradiation Effects Utilizing Fission Reactor
216	8/14/87 9/8/98	Venezuela	Project XII Under #64	Geochemistry
217	8/19/87 4/30/96	China	Project Under #157	Atmospheric Trace Gasses
221	9/21/87 12/31/95	Japan (PNC)	Project Under #39	Testing of Oxide Fuel in EBR-II
222	9/24/87 9/24/97	Nordic Countries	Project	Exchange of Informatin·
224	9/28/87 9/28/97	Poland	Umbrella	Science and Technology
226	10/13/87 4/30/96	China	Project IV Under #157	Coal Preparation and Waste Stream Utilization
227	10/13/87	China	Project V Under	Atmospheric Fluidized Bed

DEPARTMENT OF ENERGY RESEARCH AND DEVELOPMENT BILATERIAL AGREEMENTS
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Index	Start/End Dates	Country	Type	Principal Subjects
	4/30/96		#157	Combustion Information Exchange
228	10/16/87 2/1/95	Japan	Project Under #42	Coal R&D
231	11/19/87 11/19/92 Renegotiating	Canada	Umbrella	Magnetic Fusion
235	2/11/88 None	Sweden	Umbrella	Subject and Umbrella Contents are Classified
236	2/16/88 2/16/98	Canada	Project II Under #196	Natural Gas Hydrates
239	2/29/88 9/8/98	Venezuela	Project XIII Under #64	Microbial EOR
242	4/11/88 4/11/98	Australia	Umbrella	Energy R&D
243	4/14/88 12/31/91 Renegotiating	European Union	Project Under #197	Collaborative Particle Control Program
244	5/1/88 5/1/93	Yugoslavia	Umbrella	Science & Technology
247	6/10/88 4/11/98	Australia	Project Under #242	Alternative Fuels
249	6/20/88 6/20/98	Japan	Intergovern-mental	Research and Development in Science and Technology
253	8/26/88 8/26/98	United Kingdom	Project	Gas Cooled Reactor Graphite Technology
257	12/19/88 9/19/04	France	Umbrella	High Energy Laser Matter Physics R&D
258	12/21/88 12/21/98	Japan (Monbusho)	Project Under #115	Data Link and Data Link Projects for Fusion
260	1/13/89 4/11/98	Australia	Project Under #242	Research-in-Progress

DEPARTMENT OF ENERGY RESEARCH AND DEVELOPMENT BILATERIAL AGREEMENTS
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Index	Start/End Dates	Country	Type	Principal Subjects
261	1/31/89 12/15/96	European Union	Project Under #197	Fusion - Fuel Processing
263	2/14/89 12/31/96	Canada	Project IV Under #196	Coal/Heavy Oil Coprocessing
264	2/16/89 9/8/98	Venezuela	Project XIV Under #64	Exchange of Energy Related Personnel
265	5/11/86 4/11/98	Australia	Project Under #242	Oil Shale Research
266	6/1/89 None	Costa Rica	Project	Clean Coal Technologies
269	12/1/89 12/1/94	France	Umbrella	Subject/Contents Classified
270	1/11/90 1/11/95	Japan (JAERI)	Project IX Under #134	Fusion R&D Collaborative Program on the Data Link
271	1/17/90 1/17/95	France	Project Under #127	Waste Immobilization Technology
272	3/15/90 3/15/95	Poland	Project	Clean Coal Technology at Powerplant in Cracow
273	3/30/90 9/15/98	Japan (PNC)	Project (SMA-1) Under #249	NDA for Feed Pu Storage in Auto Production of MOX
274	3/30/90 9/15/98	Japan (PNC)	Project (SMA-2) Under #249	Authentication and Identification of MOX Fuel
275	3/31/90 9/15/98	Japan (PNC)	Project (SMA) Under #240	Pu Isotopic and Concentration for Chemical Process
277	6/1/90 6/1/95	Russia	Umbrella	S&T Cooperation Peaceful Uses of Atomic Energy
278	6/11/90 6/11/00	United Kingdom	Umbrella	Energy R&D
279	6/25/90 / /	Chile	Protocol of Intent	Deveployment of Clean Coal Technologies

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280	7/2/90 7/2/95	Japan (JAERI)	Project	Nuclear Materials Control Accountancy . . . Protection
281	7/23/90 9/15/98	Japan (PNC)	Project (SMA) Under #249	NDA Tech Process Holdup Pu Conversion Development
285	9/7/90 12/4/94 Renegotiating	Canada	Project V Under #46	In-Situ Combustion with Steam and Oxygen
286	9/18/90 9/18/95	Russia	Project Under #277	Environmental Restoration and Waste Management
287	12/8/90 12/8/95	Venezuela	Umbrella	Science and Technology
288	1/25/91 9/15/98	Japan (PNC)	Project (SMA) Under #249	Safeguards Techniques for Monitors -- JOYO Reactor
289	1/31/91 9/15/98	Japan (PNC)	Project (SMA) Under #249	Safeguards Techniques for Monitors -- MONJU Reactor
291	2/28/91 6/30/95	Germany	Project Under #31	NDA for siemens Mixed U-Pu Oxide Fuel (MOX-II)
292	3/01/91 12/15/96	European Union	Project Under #197	Fast Ions and Alpha Particles
293	3/26/91 9/15/98	Japan (PNC)	Project (SMA) Under #249	Pu Storage by Passive Gamma Spectroscopy
294	7/5/91 7/5/96	Russia	Project Under #277	Magnetic Confinement Fusion
295	7/5/91 7/5/96	Russia	Project Under #277	Fundamental Properties of Matter
296	9/23/91 9/23/96	Switzerland	Project III Under #158	Site Characterization, Repository Performance, Validation
297	9/30/91 8/25/95	Canada	Project #2 Under #107	Subsidiary Agreement #2 Technical Coop Program
298	10/1/91 10/1/96	United Kingdom,	Umbrella	Liquid Metal Reactor/Fast Ractor R&D

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		France, Germany		
299	10/16/91 10/16/96	Poland	Umbrella	Krakow Clean Fossil Fuels and Energy Efficiency
300	10/22/91 10/22/96	Czech & Slovak	Intergovern-mental	Science and Technology
301	1/6/92 1/ 6/97	South Korea	Intergovern-mental	Science and Technology
302	3/18/92 None	Russia	Statement of Intent	Electric Power Technologies
303	4/16/92 4/16/97	Japan (JAERI)	Project (XI) Under #134	Test Negative Ion Sources Accelerators . . . Injectors
	5/7/92 5/7/97	Ukraine	Self-Renewing Every Five Years	Environmental Protection
304	6/2/92 / /	Hungary	Terms of Reference	Technical and Administrative Assistance
305	6/17/92 6/17/97	Russia	Umbrella	Fuels and Energy
306	6/29/92 / /	Brazil (Ceara)	Protocol of Intent	Solar Energy Based Rural Electrification Program
307	6/29/92 / /	Brazil (Pernambuco)	Protocol of Intent	Solar Energy Based Rural Electrificaiton Program
308	7/21/92 7/21/98	European Union (Japan, Russia)	Umbrella	ITER
309	7/29/92 7/29/94	Germany	Project (Annex) Under #291	NDA for Siemens Mixed U-Pu Oxide Fuel (MOX-II)
310	10/1/92 10/1/97	Australia	Umbrella	Nuclear Material Control Safeguards Application
312	12/16/92 12/16/97	Spain	Umbrella	Radioactive Waste Management

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313	12/16/92 12/16/97	Sweden	Project Under #81	Site Characterization and Repository Performance
315	2/18/93 / /	Russia	Umbrella	Disposition HEU Extracted from Nuclear Weapons
316	3/26/96 3/26/97	Japan (PNC)	Project Under #195	Characterization and Predictive Technologies
317	7/21/93 7/21/97	Saudi Arabia	Annex II Under #199	Annex II: Assessment of Solar Radiation Resources
318	8/4/93 8/4/95	Japan (PNC)	Project (SMA-13) Under #249	SMA 13: Fuel Pin . . . MOX Fuel Fabrication Facility
319	9/2/93 9/2/95	Japan (PNC)	Project (SMA-14) Under #249	Video Motion Detection . . . PFPF Product Storage
321	9/15/93 9/15/98	Japan (PNC)	Umbrella	R&D Nuclear Materials Control and Accounting for Safeguards
322	10/1/93 10/1/98	Russia	Umbrella	Energy Efficiency and Renewable Energy
323	10/4/93 10/4/98	Italy	Interngovern-mental	Science and Technology
324	1/14/94 1/14/99	Russia	Umbrella	Radioactive Contamination Health and Environment
325	1/27/94 12/31/97	Japan (PNC)	Project Under #249	Waste Measurement System Glove Box Accounting Systems
326	1/27/94 None	Japan (PNC)	Project Under #249	Upgraded Glove Box Accounting Systems
327	2/9/94 2/9/96	Saudi Arabia	Annex III Under #199	Assessment of Geothermal Energy Resources
328	3/16/94 / /	Russia	Project Under #322	Replacement of Russian Pu Production Reactors
329	3/21/94 7/21/98	European Unin	Project Under #308	ITER Engineering Design Activities
330	4/8/94 / /	Ukraine	Statement of Intent	Shutdown Chernobyl Nuclear Power Plant

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331	4/18/94 4/18/99	Argentina	Umbrella	International Safeguards Applications
332	4/18/94 4/18/99	Brazil	Umbrella	International Safeguards Applications
333	4/26/94 9/7/98	Venezuela	Project XV Under #64	Oil Recovery Information and Technology Transfer
334	5/12/94 4/11/98	Australia	Project Under #242	Bio-Electromagnetic Research
335	6/13/94 6/13/99	South Korea	Project Under #96	Fossil Energy Technology
336	6/27/94 6/27/99	China	Project Under #157	Coal-Fired Magnetohydro-Dynamic Power Generation
337	9/18/94 / /	Austria	Umbrella	Energy Efficiency/Conservation and Climate Change
338	9/24/94 / /	Pakistan	Statement of Intent 1	Fossil Fuel and New and Renewable Energy
339	9/24/94 / /	Pakistan	Statement of Intent 2	Climate Change
340	9/24/94 / /	Pakistan	Statement of Intent 3	Fossil Fuel and New and Renewable Energy
341	11/18/94	Canada	Statment of Intent Under #196	Biennial Biomass Conference of the Americas
342	11/19/94 None	France	Project #1 Under #257	Megajoule-Class Solid State Lasers
343	11/19/94 8/9/04	France	Project #2 Under #257	Megajoule-class Solid State Laser Technology
344	12/13/94 / /	Chile	Statement of Intent	Renewable and Energy Efficiency Technologies
345	2/23/95 / /	China	Umbrella	Bilateral Energy Consultations

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346	2/23/95 / /	China	Statement of Intent A	Energy Information Exchange
347	2/23/95 / /	China	Statement of Intent B	Research Reactor Fuel
348	2/23/95 2/23/00	China	Project XII Under #157	Regional Climate Research
349	2/23/95 2/23/00	China	Project XI Under #157	Coal Bed Methane Recovery and Utilization
350	2/23/95 / /	China	Letter of Intent	Renewable Energy
351	2/23/95 2/23/00	China	Umbrella	Energy Efficiency Technology Development and Utilization
352	3/7/95 / /	Chile	Statement of Intent	Control Emissions of Greenhouse Gases
353	3/13/95 3/13/00	Estonia	Umbrella	Technical Cooperatin in Clean-up Paldiski Site
354	4/10/95 / /	Mexico	Statement of Intent	Energy Cooperation
355	4/11/96 1/31/00	Japan (PNC)	Project	Nuclear Technologies
356	4/11/95 / /	Japan	Statement of Intent	Nuclear Reactor Technologies R&D
357	4/26/95 4/26/05	France	Umbrella	Accelerator Driven Technology
358	5/26/95 5/26/00	Italy	Umbrella	Energy R&D
359	6/15/05 / /	Russia	Project	Weapons Expertise for the Globus-M Project
360	6/16/95 / /	Russia	Project	Nonproliferation of Weapons/Weapons Expertise

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361	7/6/95 / /	Argentina	Statement of Intent	Renewable Energy and Energy Efficiency Technologies
362	7/17/95 7/17/05	Japan (JAERI)	Project	Nuclear Research and Development
363	7/21/95 / /	Canada	Statement of Intent Under #196	Building Energy Simulation Tools
364	7/25/95 / /	United Kingdom	Statement of Intent	Nuclear Clean-Up
365	7/31/95 1/31/97	Japan (PNC)	Project (19) Under #321	Measuring Vitrified High Level Waste Canisters
366	7/31/95 1/31/97	Japan (PNC)	Project (18) Under #321	Install Fuel Assembly System . . . Fugen Reactor
367	8/21/95 8/21/00	Poland	Project	Environmental Restoration Hazardous Waste Management
368	8/25/95 8/25/20	South Africa	Umbrella	Peaceful Uses of Atomic Energy
369	8/29/95 / /	South Africa	Terms of Reference	Sustainable Energy Development Committee
370	8/25/95 / /	South Africa	Statement of Intent 2	Energy Policy, Science and Technology, and Development
371	8/25/95 / /	South Africa	Umbrella	Sustainable Development Resource Center
372	8/25/95 / /	South Africa	Umbrella (2)	Renewable and Energy Efficiency Technologies
373	8/25/95 / /	South Africa	Statement of Intent 1	Renewable Energy (Guguletu Township)
374	8/25/95 / /	South Africa	Umbrella (3)	Electrification of Rural Clinics (Cape Town)
375	8/25/95 / /	South Africa	Statement of Intent 3	Renewable Energy (The Csir, South Africa)

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376	9/19/95 9/19/00	Brazil	Umbrella	International Safeguards Applications
377	9/20/95 9/20/00	France	Umbrella	Radioactive Waste Management
378	9/29/95 / /	Ghana	Statement of Intent	Energy Efficiency and Renewable Energy
379	10/8/95 10/8/00	France	Umbrella	Radioactive Waste Management
380	10/30/95 / /	Ghana	Statement of Intent	Peaceful Uses of Nuclear Energy

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Listing of Agreements Under the Aegis of: IAEA

Exp Date	DOE Office	Agreement #	Title
7/20/98	ER	000233	Agreement among the European Atomic Energy Community, Japan, Russia and the United States on Cooperation in the Engineering Design Activities of the International Thermonuclear Experimental Reactor (ITER)

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Exp Date	DOE Office	Agreement #	Title
1/2050	EE	000011	International Energy Agency Implementing Agreement on Solar Heating and Cooling Program
9/30/94	EE	000012	International Energy Agency Implementing Agreement on Solar Heating and Cooling Program - Annex 12: Building Energy Analysis and Design Tools for Solar Applications
8/31/94	EE	000013	International Energy Agency Solar Heating and Cooling Program - Annex 13: Advanced Low Energy Buildings
1/2050	EE	000018	International Energy Agency Hydrogen Agreement: Implementing Agreement for a Program of Research and Development on the Production and Utilization of Hydrogen
12/31/94	EE	000024	International Energy Agency Implementing Agreement on Solar Heating and Cooling Program
1/1/2050	EE	000025	International Energy Agency Annex 1: Improvement of Thermohydraulic Design and Performance in Heat Transfer Equipment
1/1/2050	EE	000026	International Energy Agency Implementing Agreement on Improved Structural Design and Reliability of Heat Transfer Equipment
1/1/2050	EE	000030	International Energy Agency Implementing Agreement for Cooperation in R&D of Wind Turbine Systems
1/1/2050	EE	000033	International Energy Agency Implementing Agreement - Annex 1: Combustion System Modeling and Diagnostics
1/1/2050	EE	000034	International Energy Agency Implementing Agreement - Annex 2: Optimal Design of Heat Exchanger Networks
1/1/94	EE	000039	International Energy Agency Implementing Agreement for a Program of R&D on Advanced Heat Pump Systems
1/1/2050	EE	000045	International Energy Agency Implementing Agreement on High Temperature Materials for Automotive Engines
1/1/2050	EE	000049	International Energy Agency Implementing Agreement for a Program of Research and Development on Energy Conservation in Buildings and Community Systems

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Exp Date	DOE Office	Agreement #	Title
1/1/2050	EE	000053	International Energy Agency Implementing Agreement for Pulp and Paper Industry
1/1/2050	EE	000055	International Energy Agency Alcohol and Alcohol Blends as Motor Fuel (Umbrella Agreement) including Annex 1: A Common Study
1/1/2050	EE	000058	International Energy Agency Implementing Agreement for Program on Bioenergy Research and Development
1/1/2050	ER	000107	International Energy Agency Implementing Agreement for a Program of Research and Development on Superconducting Magnets for Fusion Power
7/31/95	ER	000108	International Energy Agency Implementing Agreement on a Cooperative Fusion Program for the Investigation of Toroidal Physics in, and Plasma Technologies of, Tokomaks with Poloidal Divertors
7/31/95	ER	000109	International Energy Agency Implementing Agreement - Annex I: Joint Fusion Work on the Investigation of Toroidal Physics and Plasma Technologies in Asdex-Upgrade
12/31/97	ER	000110	International Energy Agency Implementing Agreement for Fusion Program of R&D on Plasma Wall Interaction in Textor
10/21/94	ER	000115	International Energy Agency Implementing Agreement for Program of R&D on Radiation Damage in Fusion Materials
10/21/95	ER	000116	International Energy Agency Implementing Agreement for Program of R&D on Radiation Damage on Fusion Materials - Annex 2: Experimentation on Radiation Damage in Fusion Materials
1/14/96	ER	000118	International Energy Agency Implementing Agreement on Fusion Cooperation Among the Three Large Tokomak Facilities (JET, JT-60, and TFTR)
4/2/2000	ER	000119	International Energy Agency Implementing Agreement - Annex 2: Joint Fusion Work on the Investigation of Plasma Confinement Physics and Technology in Reversed Field

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			Pinches (RFP)
4/2/2000	ER	000123	International Energy Agency Implementing Agreement for a Fusion Program of R&D on Reversed Field Pinches (RFP)
4/2/2000	ER	000124	International Energy Agency Annex 1: Coordination of Fusion R&D Work on Research Field Pinches (RFP)
7/6/97	ER	000266	International Energy Agency Implementing Agreement on a Cooperative Program on Environmental Safety and Economic Aspects of Fusion Power
1/1/2050	FE	000154	International Energy Agency Coal Research Service Center Project
1/1/2050	FE	000159	International Energy Agency Implementing Agreement for Performance of Research, Development and Demonstration on Enhanced Recovery of Oil
1/1/2049	FE	000181	International Energy Agency Implementing Agreement for Program of Research on Coal Liquid Mixtures
6/21/90 6/20/95			International Energy Agency Implementing Agreement for Cooperative Programme for Assessing the Impacts of High-Temperature Superconductivity on the Electric Power Sector

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Term of Agreement	Countries	Type of Agreement	Agreement Subject Area	DOE Record #
3/20/74 9/16/96	Australia, Austria, Belgium, Canada, Denmark, Commission of the Euratom, Finland, France, Germany (unified), Greece, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom	Umbrella	Nuclear data and computer programs	90
11/18/74 Indefinite	Australia, Austria, Belgium, Canada, Denmark, Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Spain, Sweden, Switzerland, Turkey, United Kingdom	Umbrella/annex	Establishment of International Energy Program through implementation of an International Energy Agency	
1/1/75 Indefinite	Australia, Austria, Belgium, Canada, Denmark, Commission of the Euratom, Finland, Germany (unified), Italy, Japan, Netherlands, Spain, Sweden, United Kingdom	Implementing/ project	Coal research	154
7/28/75 Indefinite	Australia, Belgium, Canada, Denmark, Finland, Germany (unified), Greece, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, Switzerland, Turkey, United Kingdom	Implementing/ project	Energy conservation in buildings and community systems	49
11/20/75 Indefinite	Austria, Belgium, Germany, Italy, Netherlands, Spain, Sweden, Turkey, United Kingdom	Implementing/ project, annex	Establishment of the Coal Technical Information Service	154
12/31/75 Indefinite	Australia, Austria, Belgium, Canada, Denmark, Finland, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Spain, Sweden, United Kingdom (DOI/USGS, DOE and BLM)	Establishment of Coal Research Service	This Agreement incorporates four previous implementing agreements on: Mining Technology Clearinghouse (DOI BLM), Coal Economic Assessment Services (DOE), Coal Technical Information Services (DOE, DOI/ USGS), and World Coal Resources and Reserves Data Bank (DOI/USGS)	154
12/20/76 Indefinite	Australia, Austria, Belgium, Canada, Commission of the Euratom, Denmark, Germany (unified), Greece, Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdom	Implementing/ project, annexes	Solar heating and cooling systems	11
3/16/77 Indefinite	Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, United	Implementing/ project, annex	Energy conservation/ emissions reduction	

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	Kingdom		in combustion	
3/16/77 Indefinite	Austria, Germany, Sweden, Switzerland	Implementing/ project, annex	Energy conservation through energy cascading	
3/16/77 Indefinite	Canada, Germany (unified), Italy, Japan, Norway, Sweden, Switzerland, United Kingdom	Annex	Combustion system modeling and diagnostics	33
6/28/77 4/00/97	Germany, Netherlands, Norway, Sweden, Switzerland, United Kingdom	Implementing/ project, annex	Energy conservation in heat transfer and heat exchangers	26
10/6/77 12/31/96	Germany, Israel, Spain, Switzerland	Implementing/ project, annexes	Solar power and chemical energy systems	
10/6/77 12/31/97	Canada, Commission of the Euratom, Japan, Switzerland, Turkey	Implementing/ project, annex	Fusion energy, plasma wall interaction in Textor	110
10/6/77 Indefinite	Germany, Japan, Sweden, Switzerland, United Kingdom	Implementing/ project, annex	Man-made geothermal energy systems	
10/6/77 Indefinite	Austria, Canada, Denmark, Germany (unified), Italy, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, United Kingdom	Implementing/ project, annexes	Wind turbine systems	30
10/6/77 Indefinite	Germany (unified), Japan, Switzerland	Implementing/ project, annex	Superconducting magnets for fusion power	107
10/6/77 Indefinite	Belgium, Canada, EEC, Germany, Italy, Japan, Netherlands, Sweden, Switzerland	Implementing/ project, annexes	Production of hydrogen from water	18
4/00/78 Indefinite	Belgium, Canada, Ireland, Sweden	Implementing/ project, annex	Forestry energy	
4/13/78 Indefinite	Canada, Ireland, Japan, United Kingdom	Implementing/ project, annex	Wave power R&D	
5/24/78 Indefinite	Belgium, Ireland, Sweden, United Kingdom	Implementing/ project,	Biomass conversion technical information service	58
7/27/78 Indefinite	Germany, New Zealand, Sweden, United Kingdom	Implementing/ project, annex	Energy conservation in cement manufacture	
7/27/78	Austria, Belgium, Canada, Denmark, Germany (unified), Italy, Japan, Netherlands, Spain, Sweden, Switzerland,	Implementing/	Advanced heat pump systems	39

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Indefinite	United Kingdom	project, annex	systems	
9/22/78 Indefinite	Belgium, EEC, Denmark, Germany, Netherlands, Sweden, Switzerland	Implementing/ project, annexes	Energy conservation through energy storage	60
1/1/79 Indefinite	Canada, Venezuela	Other	Heavy crude and tar sands	160
5/22/79 6/30/97	Germany, Japan, Sweden	Implementing/ project, annexes	High temperature materials for automotive engines	
5/22/79 Indefinite	Australia, Austria, Canada, Denmark, Egypt, France, Germany, Japan, Norway, United Kingdom	Implementing/ project, annex	Enhanced recovery of oil	159
5/22/79 Indefinite	Italy, Mexico, New Zealand	Implementing/ project, annex	Geothermal equip-ment	
10/21/80 10/21/94	Canada, EEC, Japan, Switzerland	Ongoing Agreement	Radiation Damage in Fusion Materials	115
11/13/80 Indefinite	Australia, Belgium, Denmark, EEC, Germany, Italy, Norway, Sweden, Switzerland	Implementing/ project, annexes	Energy technology systems analysis	268
2/18/81 Indefinite	Belgium, Canada, Japan, Netherlands, Norway, Spain, Sweden, United Kingdom	Implementing/ project, annexes	Energy conservation in the pulp and paper industry	53
1/1/81 1/1/2049	Canada, Japan, Netherlands, Spain, Sweden, United Kingdom	Implementing/ project, annex	Coal/oil liquid mixtures	181
12/17/82 Indefinite	Commission of the Euratom	Letters of Cooperation: Information Exchange	Renewable energy sources	277
12/31/84 Indefinite	Belgium, Canada, Finland, France, Italy, Japan, Netherlands, New Zealand, Norway, Sweden, United Kingdom	Implementing/ project, annexes	Alternative motor fuels	55
3/27/85 Indefinite	Australia, Canada, Denmark, Finland, Germany, Italy, Netherlands, Sweden, United Kingdom		Coal Combustion Sciences	136
12/15/86 12/15/96	Commission of the Euratom		Magnetic fusion power system	103
1/26/87 Indefinite	Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom		Energy technology data exchange	3
3/15/87 3/15/93	Canada, Norway, United Kingdom	Ongoing Agreement	Fossil Fuel Multiphase Flow Sciences	174

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3/18/88 3/18/98	Australia, Belgium, Canada, Denmark, Finland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom	Implementing/ project, annexes	Information Center for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET)	44
1/1/89 Indefinite	Austria, Belgium, Canada, Denmark, Finland, Ireland, Italy, Japan, New Zealand, Norway, Sweden, United Kingdom	Implementing/ project, annex	Bioenergy research and development	58
4/3/90 4/2/00	Commission of the Euratom, Japan	Implementing/ project	Fusion Energy/ Reversed Field Pinches (RFP)	123
4/3/90 4/2/00	Commission of the Euratom, Japan	Annex 1	Fusion Energy/ Reversed Field Pinches (RFP)	124
4/3/90 4/2/00	Commission of the Euratom, Japan	Annex 2	Fusion Energy/ Reversed Field Pinches (RFP)	119
7/5/91 7/4/96	Russia, Former Soviet Union	MOU/MOC	Magnetic confinement fusion	91
10/1/91 10/1/96	France, Germany (unified), United Kingdom	Umbrella	Liquid metal cooled fast breeder reactors	200
10/22/91 10/22/96	Czech Republic, Slovak Republic	Science and Technology Agreement	Fusion energy	259
11/20/91 11/19/01	Canada, Denmark, Commission of the Euratom, Finland, Italy, Japan, Netherlands, Norway, Spain, Sweden, United Kingdom	Implementing/ project, annex	Greenhouse gases derived from fossil fuel use	231
7/6/92 7/6/97	Canada, Commission of the Euratom, Japan	Implementing/ project, annexes	Environmental safety and economic aspects of fusion power	232
7/6/92 7/6/97	Canada, Commission of the Euratom, Japan	Umbrella	Environmentally economic aspects of fusion power	266
7/21/92 7/20/98	EEC, Germany, Japan, the former Soviet Union		Controlled thermonuclear fusion	233
11/24/92 11/11/98	Austria, Canada, Denmark, EEC, Finland, France, Germany, Israel, Italy, Japan, Korea, Netherlands, Portugal, Sweden, Switzerland, Turkey, United Kingdom	Implementing/ project, annexes	Photovoltaic power systems	
6/13/94	Canada, Japan	Implementing/	Nuclear technology	

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Term of Agreement	Countries	Type of Agreement	Agreement Subject Area	DOE Record #
6/13/99		project, annex	of fusion reactors	
7/12/94 7/12/99	Austria, Canada, France, Italy, Japan, Netherlands, Sweden, Switzerland, United Kingdom	Implementing/ project, annexes	Electric vehicle (EV) technologies	

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Exp Date	DOE Office	Agreement #	Title
9/19/95	EM	000083	Memorandum of Cooperation in the Fields of Environmental Restoration and Waste Management between the United States of America and the Union of Soviet Socialist Republics
7/4/96	ER	000091	Memorandum of Cooperation in the Field of Magnetic Confinement Fusion Between U.S. Department of Energy and the Former Soviet Union Ministry of Atomic Power and Industry
7/4/96	ER	000126	Memorandum of Cooperation in the Field of Research on Fundamental Properties of Matter between the U.S. Department of Energy and the Ministry of Atomic Power and Industry of the Former Soviet Union
1/1/2050	FE	000160	U.S. Department of Energy, Canada and Venezuela Agreement for Unitar/UNDP Information Center for Heavy Crude and Tar Sands
10/1/96	NE	000200	U.S. Department of Energy, German Ministry of Research and Technology, Commission of Atomic Energy of France, and United Kingdom Atomic Energy Agency on Exchange of Information and Cooperation in Field of R&D of Liquid Metal Cooled Fast Breeder Reactors
	NE	000250	Proposed New Agreement - United States, Russian Federation and Ukraine Lisbon Initiative on the Review and Assessment of Russian Nuclear Reactor Design and Safety
10/22/96	PO	000259	U.S., Czech Republic and Slovak Republic Science and Technology Agreement

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.11

APPENDIX K

SPALLATION NEUTRON SOURCE

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

Spallation Neutron Source (SNS)

The Contractor will support the Spallation Neutron Source Project in Oak Ridge, Tennessee, as outlined in the Memorandum of Agreement (MOA) dated January 16, 1998 and signed by the Directors of the five Laboratories supporting the Spallation Neutron Source Project. Said MOA is hereby incorporated into the contract as an attachment to this appendix. Any subsequent revisions to the MOA, which are executed by the five Laboratories, will supercede the MOA attached to this appendix upon written notification to the Contractor that said revision has been accepted by the cognizant Contracting Officer for this contract. Should there be any conflict between any provision in the MOA, or revisions thereto, and other provision(s) of this contract, said conflict shall be governed by the clause of this contract entitled, "Order of Precedence."

APPENDIX L

FY2002 FEE COMPUTATION

FEE BASIS

APPENDIX L

FY2002 FEE COMPUTATION

FEE BASIS

For FY2002, the performance measure model has one class of performance measures in Appendix B of the Prime Contract that is directly associated with fee (fee bearing). This reflects the approved FY2002 Critical Outcomes of Science & Technology, Environmental Restoration Laboratory Management and Operations. The FY2002 fee structure is in consonance with the following guidelines:

1. The maximum fee is to be in consonance with fees paid for the operation of similar FFRDC laboratories and will have a single tier structure;

2. The fees for integrated subcontractor(s) are included in the total fee;

3. The fee structure is to be based on individual critical outcomes and their associated weights as determined separately;

4. The critical outcome of Science and Technology will act as a "gate," in that a score of Excellent or above is required; there will be no fee if any critical outcome is scored as Marginal or below.

Maximum Fee

The maximum fee that BSA can earn under this matrix for FY 2002 is provisionally established at $7,000,000, if all performance measures areas were rated as "outstanding."

Fee Matrix and Fee Percentage Curve (Figure 1)

Figure (1) below is the fee-determining matrix for the case where Science and Technology (S&T) achieves a score of Excellent or above. The right two columns of the Figure (1) matrix contain a fee percentage that determines the fee earned within each of the score ranges of Outstanding, Excellent, Good and Marginal. In the event that a Critical Outcome score is between two matrix scores, the fee percentage will be determined by interpolation.

If S&T achieves a score below Excellent, the fee matrix is inapplicable. If S&T is scored in the Good range, a single partial-cost-recovery fee of $2.1M (the annual BSA operating budget) is applicable. If any critical Outcome (including S&T) is Marginal there will be no fee.

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.12

APPENDIX L

COMPUTATION OF FEE

Applicable to the Operation of
The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

Attachment 1

Brookhaven Science Associates
Fiscal Year 2002

APPENDIX L

Figure (1): Fee Determination Matrix (000)

Critical Outcome (CO)			Excellence in Science & Technology		Environmental Restoration		Laboratory Management and Operations		Max Fee: $ 7,000	
CO Weight			60%		8%		32%		% of Max Fee	
CO Max Fee			$ 4,200.0		$ 560.0		$ 2,240.0		Science	Non-Science
		Score								
		4.00	4,200.0		560.0		2,240.0		100.0%	100.0%
Outstanding		3.75	4,128.6		550.5		2,201.9		98.3%	98.3%
	>	3.50	4,061.4		541.5		2,166.1		96.7%	96.7%
		3.50	3,990.0		532.0		2,128.0		95.0%	95.0%
Excellent		3.00	3,780.0		504.0		2,016.0		90.0%	90.0%
		2.75	3,570.0		476.0		1,904.0		85.0%	85.0%
	>	2.50	3,360.0		448.0		1,792.0		80.0%	80.0%
		2.50	Flat 2,100.0		406.0	*	1,624.0	*	30.0% **	72.5% *
Good		2.00	Flat 2,100.0		364.0	*	1,456.0	*	30.0% **	65.0% *
		1.75	Flat 2,100.0		322.0	*	1,288.0	*	30.0% **	57.5% *
	>	1.50	Flat 2,100.0		280.0	*	1,120.0	*	30.0% **	50.0% *
		1.50							0.0%	0.0%
Marginal/ Unsatisfactory		↕	**No Fee**							
		0.00							0.0%	0.0%

* No Fee for this category if Science's rating is in the "Good" range.

** This reflects a percentage of total fee.

Note: If any of the Critical Outcomes are rated less than "Good" then the Contractor earns no fee for FY 2002.

Fee for Integrated Subcontractors

The Laboratory's "integrated subcontractors" are defined as those subcontractors that are part of the BSA management structure and have responsibilities for the direct supervision of BSA employees. In FY2002, BSA's maximum fee pool is the only fee pool available for the integrated.

Payments and Advances

For purposes of installments of fee, the historical fee of $6,600,000, based on an excellent performance rating will be used for determining the 90% fee payment authorized for FY 2002 which is $5,940,000. If, after DOE's evaluation of BSA's performance for FY2002, a higher amount of fee is authorized then BSA may draw the difference between the higher fee and the amount received through the periodic installments for FY 2002. If however, after DOE's evaluation of BSA's performance for FY2002, a lower amount of fee is authorized, BSA will reimburse DOE all amounts received through periodic installments above the authorized fee amount within 30 days after receiving notice from DOE of the fee authorized for FY2002.

Appendix M
Modification No. M090
Supplemental Agreement to
Contract No. DE-AC02-98CH10886

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.13

APPENDIX M

CONTRACT GUIDANCE FOR PREPARATION OF DIVERSITY PLAN

Applicable to the Operation of The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M088

Appendix M

Contract Guidance for Preparation of Diversity Plan

This Guidance is to assist the Contractor in understanding the information being sought by the Department for each of the Diversity elements and where these issues may already be addressed in the contract. To the extent these issues are already addressed in a contract, the Contractor need only cross reference the location.

Work Force

This contract includes clauses on Equal Opportunity and Affirmative Action. The Contractor should discuss its policies and plans for implementation of these clauses in its operations. If the Contractor already has procedures in place, these should be discussed and copies provided.

Educational Outreach

The Contractor should outline or discuss any programs already provided, or which it intends to provide, which will provide employees an opportunity to improve their employment skills and opportunities. These programs may already be discussed in the proposal submitted for this contract or in the contract itself and could include: educational assistance allowances, provision for outside training programs either during or outside regular work hours, and executive training programs for non-executive employees. The Contractor should also discuss any plans to participate in any programs supporting Historically Black Colleges and Universities, Hispanic Serving Institutions and Native American Institutions.

Community Involvement and Outreach

An offeror's proposal or this contract may include a section dealing with community involvement and outreach activities. In that event, those sections may be cross referenced and do not need to be repeated. Contractor community relations activities could include support for the following activities: support for science, mathematics and engineering education; support for community service organizations; assistance to governmental and community service organizations and for equal opportunity activities; and community assistance in connection with work force reduction plans. The Contractor may provide support to these activities through direct sponsorship or making individual employees available to work with the specific community activity. The Contractor's Diversity Plan should discuss the Contractor's existing and planned activities promoting community involvement of its employees as well as the corporation.

Subcontracting

The contract contains FAR 52.219-9, "Small Business Subcontracting Plan" and other small business related clauses. The Contractor should briefly summarize its subcontracting plan. If the Contractor is participating, or plans to participate, in the Department's Mentor-Protégé Program, this involvement, or planned involvement, should be summarized. Information concerning its subcontracting plans already submitted and approved do not need to be redeveloped or renegotiated.

Economic Development (Including Technology Transfer)

Many of the Department's contracts include clauses dealing with technology transfer. Planning or activities developed under such clauses may apply to this element of the Contractor's Diversity Plan. Additionally, some of the subcontracting activities planned by the Contractor with small business, veteran-owned small business, service –disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged businesses, or woman-owned small businesses may be entered into for the purpose of assisting the economic development of or transferring technology to such a business. The Contractor's Diversity Plan should outline and discuss its planned activities promoting economic diversification of the local community.

U.S. Department of Energy

and

Brookhaven Science Associates, LLC

ATTACHMENT J.14

APPENDIX N

CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM (CBDPP)

Applicable to the Operation of The Brookhaven National Laboratory

Contract No. DE-AC02-98CH10886
Modification No. M090

CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM (CBDPP)

The Contractor shall support the Chronic Beryllium Disease Prevention Program, as specified in the Federal Register; Part III, Department of Energy, 10 CFR Part 850, Chronic Beryllium Disease Prevention Program; Final Rule, dated December 8, 1999. The above referenced DOE regulation is hereby incorporated into the contract as an attachment to this Appendix.

Federal Register

Wednesday
December 8, 1999

Part III

Department of Energy

10 CFR Part 850
Chronic Beryllium Disease Prevention Program; Final Rule

DEPARTMENT OF ENERGY

10 CFR Part 850

[Docket No. EH–RM–98–BRYLM]

RIN 1901–AA75

Chronic Beryllium Disease Prevention Program

AGENCY: Office of Environment, Safety and Health, Department of Energy.

ACTION: Final rule.

SUMMARY: The Department of Energy (DOE) is today publishing a final rule to establish a chronic beryllium disease prevention program (CBDPP) to reduce the number of workers currently exposed to beryllium in the course of their work at DOE facilities managed by DOE or its contractors, minimize the levels of, and potential for, exposure to beryllium, and establish medical surveillance requirements to ensure early detection of the disease. This program improves and codifies provisions of a temporary CBDPP established by DOE directive in 1997.

EFFECTIVE DATE: This rule is effective January 7, 2000.

FOR FURTHER INFORMATION CONTACT: Jacqueline D. Rogers, U.S. Department of Energy, Office of Environment, Safety and Health, EH–51, 1000 Independence Avenue SW, Washington, DC 20585, 301–903–5684.

SUPPLEMENTARY INFORMATION:

I. Introduction
- A. Background
- B. Chemical Identification and Use
- C. Health Effects
- 1. Chronic Beryllium Disease
- 2. Beryllium Exposures at DOE Operations
- 3. Epidemiology
- 4. Value of Early Detection

II. Legal Authority and Relationship to Other Programs
III. Overview of the Final Rule
IV. Section-by-Section Discussion of Comments and Rule Provisions
- A. Subpart A—General Provisions
- B. Subpart B—Administrative Requirements
- C. Subpart C—Specific Program Requirements

List of Commenters
V. Procedural Requirements
- A. Review Under Executive Order 12866
- B. Review Under the Regulatory Flexibility Act
- C. Review Under the Paperwork Reduction Act
- D. Review Under the National Environmental Policy Act
- E. Review Under Executive Order 13132
- F. Review Under Executive Order 12988
- G. Review Under the Unfunded Mandates Reform Act of 1995
- H. Review Under Small Business Regulatory Enforcement Fairness Act of 1996

Appendix A to the Preamble—References
Appendix B to the Preamble—Questions and Answers Concerning the Beryllium Induced Lymphocyte Proliferation Test (Be–LPT), Medical Records, and the Department of Energy (DOE) Beryllium Registry

I. Introduction

This final rule implements a chronic beryllium disease prevention program (CBDPP) for the Department of Energy (DOE or the Department). This program will reduce the number of workers currently exposed to beryllium at DOE facilities managed by DOE or its contractors, minimize the levels of, and potential for, exposure to beryllium, establish medical surveillance requirements to ensure early detection of disease, and improve the state of information regarding chronic beryllium disease and beryllium sensitization.

On December 3, 1998, DOE published a Notice of Proposed Rulemaking (NOPR) for public comment in the **Federal Register** (63 FR 66940) proposing regulations for a chronic beryllium disease prevention program. The public comment period for the NOPR ended on March 9, 1999. DOE received 36 comment letters. In addition, public hearings were held on February 3, 1999, in Oak Ridge, Tennessee; February 9, 1999, in Golden, Colorado; and February 11, 1999, in Washington, DC. Comment letters were received from private individuals, DOE contractors, other federal agencies, trade associations, academia, public health and medical professionals, and attorneys.

On June 3, 1999, DOE published a notice of limited reopening of the comment period (64 FR 29811) to solicit public comments on options that DOE was considering for the criteria to be used for the release or transfer of equipment and other items previously used in DOE beryllium operations, either to other DOE facilities or to the public. In response to this reopening of the comment period, DOE received 15 additional comments.

DOE has carefully considered the comments and data from interested parties, as well as reference works, journal articles, and other information relevant to the subject of the rulemaking.

A. Background

DOE has a long history of beryllium use because of the element's broad application to many nuclear operations and processes. Beryllium metal and ceramics are used in nuclear weapons, as nuclear reactor moderators or reflectors, and as nuclear reactor fuel element cladding. At DOE, beryllium operations have historically included melting, casting, grinding, and machine tooling of parts.

Inhalation of beryllium dust or particles can cause chronic beryllium disease (CBD) or beryllium sensitization. CBD is a chronic, often debilitating, and sometimes fatal lung condition. Beryllium sensitization is a condition in which a person's immune system becomes highly responsive (allergic) to the presence of beryllium in the body. There has long been scientific consensus that exposure to airborne beryllium is the only cause of CBD.

As of September 1999, among the 11,266 current and former DOE federal and contractor workers who were screened for the disease, 130 workers had been diagnosed with CBD, and another 277 workers had become sensitized to beryllium. DOE anticipates an increase in the number of workers who may be exposed to beryllium as DOE moves forward with deactivating and decommissioning former nuclear weapons production facilities.

The current worker protection permissible exposure limit (PEL) of 2 $\mu g/m^3$, measured as an 8-hour, time-weighted average (TWA), was adopted by the Occupational Safety and Health Administration (OSHA) in 1971 and codified in 29 CFR 1910.1000, Tables Z–1, Z–2 and Z–3 by reference to existing national consensus standards. DOE's predecessor agency, the Atomic Energy Commission (AEC), had previously established the same limit of 2 $\mu g/m^3$ for application at its facilities in 1949, and that limit has remained in effect at DOE's facilities up to the present. In 1977, the National Institute for Occupational Safety and Health (NIOSH), a federal agency, recommended to OSHA an exposure limit of 0.5 $\mu g/m^3$ for beryllium. NIOSH, at the same time, classified beryllium as a potential occupational carcinogen.

Between the 1970s and 1984, there appeared to be a significant reduction in the incidence rate of CBD. This, coupled with the long latency period for the disease, led to the assumption that CBD was occurring only among workers who had been exposed to high levels of beryllium decades earlier (e.g., in the 1940s). However, the number of confirmed cases of CBD, more recent data suggesting the occurrence of CBD among workers with low-level exposures, and the expected future increase in the number of workers potentially exposed to beryllium (during decontamination and decommissioning activities) all indicate a need for more

aggressive workplace controls to minimize worker exposure to beryllium in the DOE complex.

In December 1998, the American Conference of Governmental Industrial Hygienists (ACGIH) published a Notice of Intended Change for its beryllium exposure limit. ACGIH is a professional organization that develops and publishes consensus occupational health standards. In the Notice, ACGIH proposed an 8-hour TWA of 0.2 $\mu g/m^3$ to help minimize the occurrence of CBD and sensitization. DOE's NOPR did not address ACGIH's proposed change because publication of the NOPR preceded ACGIH's announcement.

DOE has reviewed current technical information and is of the opinion that it is difficult to determine the exposure level that is necessary to eliminate the risk of contracting CBD. Until OSHA completes its rulemaking, DOE has decided to implement an aggressive, two-pronged exposure reduction and minimization program that is expected to further protect DOE federal and contractor workers from the hazards associated with exposure to beryllium. While DOE acknowledges that this rule may not eliminate the risk of contracting CBD, DOE believes that this rule will significantly decrease the number of workers exposed and the level of exposure to beryllium, and therefore, is expected to decrease disease. First, DOE is establishing an 8-hour TWA action level of 0.2 $\mu g/m^3$ that triggers certain workplace precautions and control measures. Second, DOE is requiring its contractors and any covered DOE employers to establish in their CBDPPs exposure reduction and minimization measures designed to reduce potential exposure to levels below the action level. This program will enhance and supplement existing worker protection programs established under DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees.

This rulemaking initiative was preceded by several years of information gathering and data analysis. In 1996, DOE surveyed its contractors to characterize the extent of beryllium usage, the types of tasks involving beryllium usage, the controls in place for each task, the estimated number of workers exposed during each task, and the estimated exposure levels associated with each task. This survey found that between 1994 and 1996, 10 of the 15 DOE sites surveyed performed 64 different operations or processes that could expose workers to beryllium. The surveyed DOE sites estimated that between 518 and 530 workers in 58 different job categories were potentially exposed to beryllium in the performance of these 64 operations or processes. These estimates were updated in 1999 through a cost survey conducted by the Office of Environment, Safety and Health (1999 Environment, Safety and Health Cost Survey). In this survey, 14 DOE sites indicated that they would be affected by the proposed rule. These sites reported that 1,634 workers in more than 100 different job categories would be potentially exposed to beryllium and 1,236 of these workers (75.6 percent) would be potentially exposed at the proposed action level or PEL.

The 1996 survey also provided information on exposure levels experienced by workers at the surveyed sites. Although the exposure data were not comprehensive, the reported 8-hour TWA exposure data (personal breathing zone monitoring results) for these workers ranged from nondetectable to 25 $\mu g/m^3$. Most of these exposure levels were reported to be below the 2 $\mu g/m^3$ 8-hour TWA PEL. To control worker exposures in the affected processes or operations, the surveyed sites reported the use of various engineering and administrative controls, including ventilation hoods, glove boxes, wet machining methods, high-efficiency particulate air (HEPA) vacuums, regulated areas, action levels and administrative warning levels, and personal protective equipment. The survey showed that beryllium exposure controls varied considerably among the DOE facilities.

To supplement the data obtained from the 1996 survey, the Department published a **Federal Register** notice on December 30, 1996, requesting scientific data, information, and views relevant to a new DOE beryllium health standard (61 FR 68725). This was followed by two Beryllium Public Forums, one held in Albuquerque, New Mexico, and one held in Oak Ridge, Tennessee, in January 1997.

Acting on the information compiled from these various sources, and in view of the time needed to promulgate a rule, then-Secretary of Energy Pena directed the Office of Environment, Safety and Health to publish a new DOE policy to protect the workforce while the Department moved forward with its rulemaking process. DOE Notice 440.1, Interim Chronic Beryllium Disease Prevention Program, was signed by Secretary Pena and issued on July 15, 1997. This interim Notice established a CBDPP that enhanced and supplemented worker protection programs under DOE Order 440.1A.

Because of the complexity and significance of issues regarding the development of a DOE beryllium worker protection rule, Secretary Pena also established the Beryllium Rule Advisory Committee (BRAC) in June 1997 to advise DOE on issues pertinent to the proposed rulemaking. The BRAC, which consisted of a diverse set of stakeholders and recognized experts from DOE, other federal agencies, industry, labor, medicine, and academia, explored issues and generated recommendations for consideration in the development of a CBDPP rule.[1]

B. Chemical Identification and Use

Beryllium (atomic number 4) is a silver-gray, metallic element with a density of 1.85 g/cm^3 and a high stiffness. The second lightest of the metals, beryllium also has a high melting point (1285° C) and heat absorption capacity; a pound of beryllium will absorb as much heat as 5 pounds of copper.

Beryllium occurs naturally in the earth's surface in about 30 minerals found in rocks, coal and oil, soil, and volcanic dust. Beryllium used in industry begins as a silicate ($BeSiO_3$) in beryl and bertrandite ores. In very pure crystalline form, beryl takes the form of gems, such as blue-green aquamarine and green emeralds. Bertrandite is mined in Utah. The United States is the world's leading producer, processor, and consumer of beryllium products.

Beryllium, discovered in 1798, was not widely used in industry until the 1940s and 1950s. Beryllium can be used as a pure metal, mixed with other metals to form alloys, processed to salts that dissolve in water, and processed to form oxides and ceramic materials.

Beryllium metal has been produced for various industrial uses, especially in the aerospace and defense industries. Both structural and instrument grade materials are manufactured, including windshield frames and other structures in high-speed aircraft and space vehicles, aircraft and space shuttle brakes, satellite mirrors and space telescopes, inertial guidance systems and gyroscopes, neutron moderators or reflectors in nuclear reactors, X-ray windows, and nuclear weapons components.

In alloys, beryllium confers on metal specific properties of resistance to corrosion, wear, and fatigue; high electrical and thermal conductivity;

[1] Individual members and groups of members made BRAC recommendations. The recommendations were generated by the facilitated process used during the meetings and were not adopted by the committee as consensus opinions. For convenience of reference these recommendations are referred to as the "BRAC recommendations."

strength; and hardness. Beryllium-copper (BeCu) alloys usually contain about 2 percent beryllium, but vary greatly in composition to meet different industrial and consumer needs. Beryllium is also added to aluminum, nickel, zinc, and zirconium for some applications. Beryllium alloys are used for springs, switches, relays, and connectors in automobiles, computers, radar and telecommunications equipment, and other instruments; high-strength non-sparking tools; molds or casts to make metal, glass, and plastic items; sports equipment such as golf clubs and bicycle frames; and dental bridges and related applications.

Other beryllium materials include soluble salts and oxides. Beryllium soluble salts, such as beryllium fluoride, chloride, and sulfate, are used in nuclear reactors, in glass manufacture, and as catalysts for certain chemical reactions. Beryllium Oxide (BeO) is used to make ceramics for electronics, and other electrical equipment. Beneficial properties of BeO include hardness, strength, excellent heat conductivity, and good electrical insulation.

C. Health Effects

DOE received a number of comments (Exs. 2, 5, 14, 19, 20, 22, 23, 24, 26, 29, 30)[2] regarding the "Health Effects" section of the NOPR. DOE has carefully considered these comments and has revised the following health effects discussion as appropriate.

1. Chronic Beryllium Disease

Chronic beryllium disease (CBD) is a granulomatous lung disease that is caused by the body's immune system response (similar to an allergic reaction) to inhaled dust or fumes containing beryllium metal, alloys, beryllium compounds or mixtures, or insoluble beryllium salts. The body's immune system response to beryllium is often called beryllium sensitization. Beryllium sensitization precedes the development of CBD. Sensitization can occur quickly or many years after exposure to beryllium, progressing into disease at a rate of approximately 10 percent a year (ref. 1)[3].

It is hypothesized that beryllium is a hapten (a substance that provokes an immune response only when combined with another substance, generally a protein) that binds to peptides on mucosal surfaces. In susceptible individuals the beryllium-peptide complex initiates an immune response, which may progress ultimately to granuloma formation in the pulmonary interstitium. Data have suggested that CBD can occur at relatively low exposure levels and, in some cases, after relatively brief durations of exposure. The International Agency for Research on Cancer (IARC) and ACGIH classify beryllium as a human carcinogen.

Frequently reported symptoms include one or more of the following: dyspnea (shortness of breath) on exertion, cough, fever, night sweats, and chest pain and, less frequently, arthralgias (neuralgic pain in joints), fatigue, weight loss, or appetite loss. On physical examination, a doctor may find signs of CBD results, such as rales (changes in lung sounds), cyanosis (lack of oxygen), digital clubbing, or lymphadenopathy (enlarged lymph nodes). A radiograph (X-ray) of the lungs may show many small scars. Patients may also have an abnormal breathing test, pulmonary function test, and a blood test, the peripheral blood beryllium-induced lymphocyte proliferation test (Be–LPT). Examination of the lung tissue under the microscope may show granulomas, which are signs of damage due to the body's reaction to beryllium. CBD may be confused with other lung diseases, especially sarcoidosis. In advanced cases, there may be manifestations of right-sided heart failure, including cor pulmonale (enlarged right ventricle of the heart caused by blockage in the lungs).

The Be-LPT is highly specific for beryllium sensitivity and has a high predictive value for beryllium disease. It is the most definitive means of ruling out beryllium disease as the cause of non-specific lung and other symptoms. Therefore, this measurement of sensitization to beryllium identifies at-risk individuals, as well as individuals whose lung problems are not beryllium related (ref. 1). For individuals whose Be-LPT screening results exceed a certain threshold, an additional Be-LPT is conducted on cells washed from a segment of the lung. The presence of granulomata in the lung of an individual with a positive lung Be-LPT confirms the presence of CBD. In the absence of granulomata or other clinical evidence of CBD, individuals with a positive Be-LPT are classified as sensitized to beryllium.

The clinical course of CBD is highly variable. Some individuals deteriorate rapidly; most experience long, gradual deterioration. Treatment consists of oral corticosteroid therapy. Individuals with impaired respiratory gas exchange may require continuous oxygen administration.

Individuals sensitized to beryllium are asymptomatic and not physically impaired. Once sensitization has occurred, it is medically prudent to prevent additional exposure to beryllium. Individuals with CBD have a clinical illness varying from mild to severe. In severe cases, the affected individuals may be permanently and totally disabled. Mortality of the sensitized individuals directly attributable to CBD and its complications is estimated to be 30 percent (ref. 2). This estimate is based upon historical data reflecting both the higher levels of exposure that occurred in the workplace prior to regulation of workplace exposure in the late 1940s and a tracking of the medical history of subjects of CBD over several decades. DOE's more recent experience with improved diagnoses and treatments may result in a lower mortality rate for CBD cases.

2. Beryllium Exposures at DOE Operations

DOE's medical surveillance programs are discovering cases of CBD among workers who were first exposed after 1970, when DOE facilities were expected to maintain workers exposure to beryllium below the OSHA PEL. As of June 1999, 119 workers (88 at the Rocky Flats facility in Golden Colorado, 29 at the Y–12 Plant in Oak Ridge, Tennessee, and two at the Hanford facility in Richland, Washington) have been diagnosed with CBD, and another 258 workers (197 at the Rocky Flats facility, 59 at the Y–12 Plant, one at the Hanford facility, and one at the Mound facility in Miamisburg, Ohio) have been diagnosed as sensitized to beryllium from among approximately 10,000 current and former DOE federal and contractor workers who were screened for the disease.

A worker's exposure is measured by personal monitoring, which is accomplished by sampling the air within the breathing zone of the worker. Personal monitoring of occupational exposures to beryllium was not widely adopted at DOE sites until the 1980s. Prior to the 1980s, many sites relied on area monitoring to assess occupational exposures to beryllium. However, results from area monitoring have been shown to significantly underestimate actual exposure levels. Since 1984, personal sampling data have provided more precise information on occupational exposure to beryllium at DOE sites.

Available personal sampling data provides a clear indication of the low

[2] A list of commenters is included as an appendix to the Section-by-Section Discussion of Comments and Rule Provisions in this Supplementary Information section.

[3] A listing of references is included as an appendix to this Supplementary Information section.

levels of beryllium exposure that can be achieved in both fabrication and machining operations, and decommissioning and decontamination projects, when effective control strategies are implemented. Most beryllium fabrication and machining operations at DOE have occurred to date at the Rocky Flats facility, and at the Y-12 Plant. Over time, engineering improvements and advanced control strategies have significantly reduced occupational beryllium exposure levels in these operations.

Since 1980, and continuing through 1996, about 1600 personal samples were collected at the Oak Ridge Y-12 Plant (Table 1). These samples were taken at several different Y-12 operations associated with CBD, with a bias toward sampling those jobs where exposure potential was greatest or where previous monitoring results were high. Despite this bias, over two-thirds of sample results were below the limit of detection of 0.1 $\mu g/m^3$ for the sampling and analytical method used at Y-12.

TABLE 1.—OAK RIDGE Y-12 PLANT PERSONAL SAMPLING FOR BERYLLIUM EXPOSURE

	1980 to 1989	1990 to 1996
Number of Samples	148	1448
Estimated Arithmetic Mean Level of Exposure [1]	0.9 $\mu g/m^3$	0.3 $\mu g/m^3$
Percent of Samples Less Than 2 $\mu g/m^3$ [2]	94%	98%

[1] The arithmetic mean was estimated from the samples using linear regression.
[2] Samples were analyzed using flame spectroscopy with a detection limit of about 0.1 $\mu g/m^3$.

These Y-12 data are from beryllium operations where cases of CBD have been found. The facilities where these operations take place have not been remodeled since the 1970s. Thus the differences between sampling results measured before and after 1990 are attributed to changing work practices. For example, increased monitoring in the 1990s identified a greater number of exposures over the existing exposure limit. The investigations of these exposures resulted in changes to work practices that had contributed to the high exposures. This focus on operations with elevated exposure levels also led to a significant reduction in average exposure levels.

Personal sampling data from the Rocky Flats Building 444 Beryllium Machine Shop (Table 2) collected in 1984–85 and then again in 1986 after extensive remodeling to the ventilation system illustrates the impact and effectiveness of engineering modifications to control exposure.

TABLE 2.—ROCKY FLATS BUILDING 444 BERYLLIUM MACHINE SHOP PERSONAL SAMPLING DATA (BERYLLIUM EXPOSURE)

	1984 to 1985	1986
Number of Samples	99	279
Estimated Arithmetic Mean Level of Exposure [1]	1.19 $\mu g/m^3$ [1]	0.035 $\mu g/m^3$
Percent of Samples Less Than 2 $\mu g/m^3$ [2]	84%	99.6%

[1] The arithmetic mean was estimated from the samples using linear regression.
[2] Samples were analyzed using graphite furnace atomic absorption (AA) or Inductively Coupled Plasma (ICP) spectroscopy with a detection limit of about 0.01 $\mu g/m^3$.

The samples collected in 1984 and 1985 were the first personal samples collected in this shop following the discovery of a case of CBD in 1984. Controls in that machine shop had previously been judged to be adequate based on area monitoring. In addition to the extensive remodeling of the ventilation system in the shop to minimize leakage from ventilation hoods, operations performed outside of hoods were eliminated to the extent possible. The improved engineering controls in this shop reduced average exposure levels by a factor greater than 30, to levels approaching 1% of the existing PEL.

A final example, taken from personal sampling data collected during the decontamination of Rocky Flats Buildings 865 and 867 in 1995–1996, further demonstrates the low levels of beryllium exposure which can be achieved through the implementation of effective controls (Table 3). Each worker was sampled during each work shift during this time period.

TABLE 3.—DECONTAMINATION OF ROCKY FLATS BUILDINGS 865 AND 867 PERSONAL SAMPLING—1995 TO 1996

Number of Samples	7,673
Arithmetic Mean Level of Exposure.	0.03 $\mu g/m^3$
Percent of Samples Less Than 2 $\mu g/m^3$.	99.8%

As can be seen from the foregoing examples, machining and D&D operations at Y-12 and Rocky Flats achieved an exceptional level of exposure control.

While the application of controls eliminates predictable sources of exposure, there still can be large day-to-day variations in exposure. The exposures that remain are likely to reflect accidents, equipment failures, or poor work planning. Meeting exposure minimization goals will require planning to limit the potential for such occurrences, and monitoring to detect those that do occur, so they can be investigated and future occurrences can be prevented.

3. Epidemiology

Epidemiology is the field of public health that examines relationships between disease in people, and exposures or events that are related to that disease. Occupational epidemiology is the study of the effects of workplace exposures on the frequency and distribution of diseases and injuries.

Hardy and Tabershaw (ref. 3) reported the first evidence of the existence of CBD in a 1946 paper. The paper described "delayed chemical pneumonitis" among fluorescent lamp workers exposed to beryllium compounds. The differential diagnosis included sarcoidosis (an immune disease of unknown etiology) and tuberculosis.

There also are reports of CBD in individuals without known occupational exposure to beryllium. Under the direction of Dr. Thomas Mancuso, 16 cases of CBD were

diagnosed by X-ray examination among 20,000 residents living near a beryllium production facility in Lorain, Ohio (ref. 4). Likewise, a 1949 report described 11 patients with CBD who lived near a beryllium extraction plant (ref. 5). Ten of these 11 lived within ¾ of a mile of the plant, and exposure from plant discharges into the air was the suggested cause of their CBD. Measurements of air concentrations of beryllium at various distances from the plant provided the basis for the Environmental Protection Agency's (EPA's) community permissible exposure limit (24-hour ambient air limit of 0.01 microgram of beryllium per cubic meter of air [μg/m^3]).

In addition, CBD has been reported among family members of beryllium workers who were presumably exposed to contaminated work clothing during the 1940s and 1950s (refs. 6, 7). The virtual disappearance of CBD caused by air pollution or household exposures has been attributed to more stringent control of air emissions and improved work practices, such as mandatory work clothing exchange. However, as recently as 1989, a woman previously diagnosed with sarcoidosis was diagnosed with CBD. She had no occupational exposure, but her husband was a beryllium production worker. This is the first new case of non-occupational CBD reported in 30 years (ref. 8).

Sterner and Eisenbud suggested that CBD was a highly selective immunologic response. Their conclusion was based on epidemiologic evidence that (1) severe cases have occurred at low exposure; (2) the level of beryllium contained in tissue did not correlate with the extent of the disease; (3) there was a correlation between disease and low atmospheric concentration, but not high concentrations; (4) the onset of symptoms could occur years after the termination of exposure; and (5) pulmonary lesions were not easily reproduced in animals (ref. 7).

A registry of production plant CBD cases was started at Columbia University in 1947. A second registry of phosphor-lamp CBD cases was started around the same time. In 1952, a Beryllium Case Registry was established at the Massachusetts Institute of Technology (MIT), where files from the other beryllium registries were consolidated. The consolidated Beryllium Case Registry was moved to Massachusetts General Hospital in the 1960s, and ultimately was relocated to the National Institute for Occupational Safety and Health (NIOSH) in 1978. At that time, the Beryllium Case Registry contained 622 cases of CBD, 224 cases of acute beryllium disease, and 44 acute cases that developed into CBD. Twenty-three cases were attributed to household exposures and 42 to air pollution (ref. 6). The Beryllium Case Registry, which is now inactive, was criticized as deficient in acquiring data on cases, identifying populations at risk (denominator data), maintaining follow-up of questionable cases, and obtaining exposure data (ref. 9).

According to criteria utilized by the Beryllium Case Registry, the diagnosis of CBD included at least four of the following six criteria, with one of the first two conditions required: (1) the establishment of beryllium exposure based on occupational history or results of air samples, (2) the presence of beryllium in lung tissue or thoracic lymph tissue or in the urine, (3) evidence of lower respiratory tract disease and a clinical course consistent with beryllium disease, (4) pathological changes consistent with beryllium disease upon examination of lung tissue or thoracic lymph nodes, (5) radiologic evidence of interstitial lung disease, and (6) decreased pulmonary function tests (ref. 10).

The beryllium-induced lymphocyte proliferation test (Be-LPT) in blood and bronchoalveolar lavage (BAL) fluid have allowed earlier identification of the disease. The BAL Be-LPT now is one of the criteria required for diagnosis (refs. 11–13). Beryllium has been found to act as a specific antigen, causing proliferation and accumulation of beryllium-specific helper T lymphocytes ($CD4^+$) in the lung (ref. 14). Current data suggest that the peripheral blood Be-LPT is a specific and sensitive method for testing beryllium sensitivity (ref. 11). The presence of granulomatous tissue in the lung along with a positive BAL Be-LPT is considered definitive evidence for diagnosis of CBD (ref. 12). When a worker has clear signs and symptoms of interstitial lung disease and a positive Be-LPT, CBD may be presumed only if performing a bronchoscopy on the worker is deemed to be too risky given the health status of that of that worker.

An article published by Cullen et al. in 1987 reported on an epidemiology study of CBD among precious-metal refinery workers (ref. 15). In 1993, researchers at the National Jewish Medical and Research Center (NJMRC) published two reports on epidemiology studies that were designed to determine the incidence of CBD among beryllium workers and the value of the Be-LPT in detecting CBD (refs. 16, 17). One of these two studies was conducted at DOE's Rocky Flats Environmental Technology Site (Rocky Flats). These three epidemiology studies showed that CBD incidence among exposed workers was the same as had been reported among workers exposed in the 1940s, when the disease was first recognized. This exposure limit was originally derived by analogy to other toxic metals (ref. 18). A decline in the number of reports of CBD in the 1970s and up to 1984 led to the assumption that the 2 μg/m^3 limit had been effective in preventing CBD (ref. 6). DOE recognizes that the 1980s–1990s studies used more effective screening and diagnostic methods than the earlier studies. Nevertheless, these 1980s–1990s studies provide strong evidence that adherence to the OSHA standard has not prevented new cases of disease.

In 1991, responding to NJMRC findings, DOE's Office of Environment, Safety and Health initiated a beryllium worker health surveillance program at Rocky Flats to provide medical screening to current and former beryllium workers who had not participated in the NJMRC studies. In addition, the Office of Environment, Safety and Health initiated a study at the Oak Ridge Y–12 Plant (Y–12) in 1991 to learn if the NJMRC findings on CBD incidence and the effectiveness of the Be-LPT could be replicated. Results to date confirm NJMRC findings that CBD incidence rates are high and that the Be-LPT is an effective screening test for CBD as shown in Table 4.

TABLE 4.—RESULTS OF MEDICAL SCREENING OF BERYLLIUM-EXPOSED WORKERS AT THREE DOE SITES THROUGH DECEMBER 1997

	Rocky Flats	Y–12	Mound
Individuals Examined	6,257	1,949	632
Abnormal Be-LPT Number (percent)	221 (3.5%)	77 (4%)	1 [1]
Completed Diagnostic Exams	186	33	0

TABLE 4.—RESULTS OF MEDICAL SCREENING OF BERYLLIUM-EXPOSED WORKERS AT THREE DOE SITES THROUGH DECEMBER 1997—Continued

	Rocky Flats	Y–12	Mound
CBD Number (percent) [2]	79 (1.3%) [3]	25 (1.3%) [4]	0

[1] The one Mound employee who was found to be consistently positive declined diagnostic testing. Four others had one positive blood test result and were awaiting retesting.

[2] Includes 44 cases confirmed through biopsy and testing of lavage cells and 35 presumptive cases in which the pulmonologist diagnosed CBD but biopsy and/or lavage could not be completed.

[3] Includes 56 cases found through the surveillance program since 1991, 17 cases through the 1987–1991 NJMRC study, and 6 cases between 1984 and 1987 for a total of 79 CBD cases. Six of the 79 cases had consistently normal Be-LPT results and were identified through lung disease symptoms or abnormal chest X-rays.

[4] Includes 17 cases found in the surveillance program since 1993, 2 cases found in 1991 among beryllium workers who had been diagnosed with other lung diseases, and 6 cases found by the site clinic in 1993 among 146 currently exposed beryllium workers who were provided the Be-LPT.

In 1996, three studies reported on exposure to beryllium associated with CBD and immunologic sensitization to beryllium (refs. 19–21). Two of the studies reported on cases of CBD at Rocky Flats (refs. 19, 20). The third reported on an epidemiology study of a private sector beryllium ceramics fabrication plant that began operating in 1981 (ref. 21). Both Rocky Flats and the ceramics plant were extensively monitored for compliance with the current OSHA 8-hour TWA exposure standard of 2 $\mu g/m^3$. The authors concluded that exposures among the highest exposed groups in the plants were, on average, below the 2 $\mu g/m^3$ limit. At both plants, cases of CBD and sensitization to beryllium were found not only among the highest exposed workers, but also among the lowest exposed workers, including administrative and other personnel who did not work directly with beryllium.

Stange and colleagues reported on the findings of a health surveillance program at Rocky Flats that used the Be-LPT to screen for CBD (ref. 19). Of 97 individuals who tested positive on the Be-LPT, 28 were found to have CBD. The article included an analysis of the work histories of these 97 current and former workers. A qualitative exposure estimate based on the work histories of individuals who developed CBD concluded that exposures varied by more than one order of magnitude. Extensive air monitoring data were available for machinists, which were one of the highest exposed groups.

Barnard and colleagues completed an extensive analysis of the monitoring data associated with machining operations at Rocky Flats (ref. 20). Prior to 1984, air monitoring was accomplished with fixed area monitors located near the machine tools that were thought to be the primary sources of emissions into the work-rooms. In 1984, personal sampling was initiated, which was more representative of individual exposure. The article reported a high degree of uncertainty in exposure assessments prior to 1984 due to the lack of correlation between area monitoring and personal monitoring. The authors concluded that machinists, as a group, shared similar exposure potential, that average exposures were less than but near the 2 $\mu g/m^3$ limit, and that excursions above the limit were common.

Kreiss and colleagues studied CBD occurring in a beryllium oxide ceramic manufacturing plant (ref. 21). They found that machinists had the highest incidence rate of beryllium sensitization and the highest exposure potential. The area monitoring conducted in this plant was aimed at estimating exposures associated with job titles and was found to correlate with personal sampling. The authors concluded, "the existing data suggests that the machining exposures resulting in the 14.3 odds ratio for beryllium sensitization were largely within those permitted by current regulations." This article confirmed the findings of a study of CBD in the neighborhood of a beryllium extraction plant, which showed a correlation between ambient beryllium levels and incidence of CBD (ref. 5). Further analyses of CBD incidence at Rocky Flats, as yet unpublished, showed a similar higher risk for machinists compared to that for other workers (See Table 5).

TABLE 5.—INCIDENCE RATES OF CBD AT ROCKY FLATS

Job category	Number tested	CBD cases	Incidence rate (percent)
Beryllium Machinist	223	21	9.4
Administrative	1,903	23	1.2
Professional	1,396	15	1.1
All Employees Tested	6,254	64	1.0

Cases of CBD have occurred in machinists who worked in the Y–12 beryllium ceramic machine shop, where levels have been quite low. Only a small percentage of samples there have detected beryllium. Continuous area air monitors have operated in the shop throughout its existence. One area sample indicated levels above 2 $\mu g/m^3$ when a machine tool was operated with an exhaust duct that was disconnected. No other area measurements above 2 $\mu g/m^3$ were recorded, and the median measurement was at the level of detection.

Kreiss (ref. 22) describes the relative hazards in sectors of the beryllium industry, and risk factors for CBD and sensitization related to work processes in a beryllium manufacturing plant that produced pure metal, oxide, alloys, and ceramics. Employees in the pebble plant (producing beryllium metal) had the highest prevalence of CBD (6.4%) compared with other workers (1.3%). The pebble plant was not associated with the highest gravimetric industrial hygiene measurements, indicating that total beryllium was probably not a good indicator for hazard surveillance. The

report indicates that particle size or other characteristics may be more important contributors to risk than the total mass of breathing zone particles, that daily-weighted averages are poor estimates of personal exposure, and that methods of exposure assessment may poorly reflect actual exposures from accidents.

Several authors have highlighted the uncertainty that exists in the exposure assessments (refs. 20, 21, 23). The chemical composition of the beryllium materials used and the particle size distribution of the aerosol created by the work operation affect the bioavailability of beryllium, and neither is accounted for by current personal sampling and analytical methods. It is not known what percentage of measurable airborne beryllium is capable of reaching the regions of the lung where health effects occur. In addition, area monitoring used in the past does not correlate with the personal monitoring that is thought to be more representative of exposure (refs. 20, 23).

Epidemiologic investigations to date have failed to show whether the time course of exposure (dose rate) is biologically significant. High day-to-day variation in exposure level and excursions above the 2 $\mu g/m^3$ limit have occurred in all groups studied for which exposure data is available. Excursions make up a significant contribution to individuals' total doses, confounding attempts to understand if dose rate is an important risk factor. Beryllium oxide and metal in the lung dissolve slowly over a period of months and years (ref. 24), producing the beryllium ion that elicits an immune response (ref. 25). The persistent presence of the beryllium ion in the lung makes CBD a chronic disease (ref. 26). Both intermittent high and continual low exposures to insoluble forms of beryllium can create and maintain a lung burden that will not clear for many years, if at all (ref. 27).

Certain individuals are more susceptible to CBD than others. It has long been suspected that genetic predisposition plays an important role in determining who will develop CBD. Recent advances in genetics and immunology have made it possible for researchers to investigate the basis for CBD and to identify a genetic component (ref. 28).

Differences in individual susceptibility have made it difficult to understand the relationship between exposure and CBD. Early epidemiology studies detected similar disease rates among high- and low-exposure occupational groups (Table 6). The NJMRC researchers detected differences in disease rates among the workers they studied (Table 7). The DOE surveillance findings supported this conclusion (See Table 5). NJMRC researchers have found cases of CBD among those who had been exposed for periods as short as one month and those who had unrecognized or seemingly trivial exposure. However, the NJMRC also found evidence that disease incidence increased with increasing exposure and concluded that exposure to beryllium should be minimized.

TABLE 6.—CHRONIC BERYLLIUM DISEASE RATES

Exposed during the 1940s	Estimated exposed	Cases	Estimated incidence per 100 exposed	Estimated level of exposure $\mu g/m^3$
Residents Living Within 0.25 Mile of a Beryllium Extraction Plant [1]	500	5	1.0	1
Fluorescent Lamp Manufacturing: [1]				
Massachusetts	15,000	175	1.16	100
Ohio	8,000	32	0.4	100
Machine Shop [1]	225	11	4.9	500
Beryllium-Copper Foundry [1]	1,000	13	1.3	500
Beryllium Extraction: [1]				
Lorain, Ohio	1,700	22	1.3	1,000
Painesville, Ohio	200	0	0.0	1,000
Reading, Pennsylvania	4,000	51	1.3	1,000
Exposed from the 1970s to the 1980s	**Study participants**	**Cases**	**Incidence per 100 exposed**	**Estimated level of exposure $\mu g/m^3$**
Beryllia Ceramics Plant [2]	505	9	1.8	NA
The DOE Rocky Flats Plant [3]	895	15	1.7	1
Second Beryllia Ceramics Plant [4]	709	8	1.1	0.5

[1] Eisenbud and Lisson, "Epidemiologic Aspects of Beryllium-Induced Non Malignant Lung Disease: A 30-Year Update," JOM, Vol. 25, pp 196–202, 1983.
[2] Kathleen Kreiss et al., "Beryllium Disease Screening in the Ceramics Industry," JOM, Vol. 35, pp 267–274, 1993.
[3] Kathleen Kreiss et al., "Epidemiology of Beryllium Sensitization and Disease in Nuclear Workers," Am. Rev. Res. Dis., Vol. 148, pp 985–991, 1993.
[4] Kathleen Kreiss et al., "Machining Risk of Beryllium Disease and Sensitization with Median Exposures Below 2 $\mu g/m^3$," Am. J. Ind. Med., Vol. 30, pp 16–25, 1996.

TABLE 7.—BERYLLIUM SENSITIZATION AND DISEASE RATES AT ROCKY FLATS [1]

Beryllium process title	Workers sensitized	Workers doing process	Sensitization rate (percent)
Cleaning Tools, Machines	7	255	2.7
Machining	6	189	3.2
Inspection	2	138	1.4
Metallurgical Sample Preparation	3	115	2.6
Sawing	5	6	4.7
Trepanning	3	77	3.9
Band Sawing	4	67	6.0

TABLE 7.—BERYLLIUM SENSITIZATION AND DISEASE RATES AT ROCKY FLATS [1]—Continued

Beryllium process title	Workers sensitized	Workers doing process	Sensitization rate (percent)
Decanning, Shearing	2	65	3.1
Precision Grinding	2	31	6.5
All participants	**Number**	**Participants**	**Rate (percent)**
Sensitized	18	895	2.0
Confirmed CBD Cases	15	895	1.7

[1] Kathleen Kreiss et al. "Epidemiology of Beryllium Sensitization and Disease in Nuclear Workers," Am. Rev. Res. Dis., Vol. 148, pp 985–991, 1993.

A recent publication by Eisenbud in January 1998 (ref. 29) consolidated the previous epidemiology studies that have questioned the relevance of the current PEL after evaluating the effect of the level of exposure on disease. In this article, Eisenbud concludes that it "appears" the current 2 $\mu g/m^3$ standard is not protective enough. Rather than recommend an alternative exposure limit, however, Eisenbud points to the need for the development of an animal model to aid in better understanding the etiology of CBD and suggests that innovative measures may be needed to control the disease.

In summary, evidence suggests higher incidence of CBD among workers with higher exposures (e.g., machinists), but, at lower exposure levels, other factors may operate to confound a clear dose-response relationship. These factors include: (1) the effect of peak exposures (such that most of the exposure results from short-term episodes; (2) the inadequacy of area monitoring in reflecting actual exposure; (3) the effect of chemical composition, size, and shape on the bioavailability of the inhaled particles; (4) inadequate monitoring of the chemical beryllium composition, size, and shape of inhaled particles; and (5) the effect of genetic predisposition on developing beryllium sensitization and CBD. As a result, the existing literature does not point to a specific tolerance level for exposure to beryllium.

4. Value of Early Detection

Early detection of a disease is of value if it leads to earlier treatment and a better prognosis for the individual being tested. Screening for CBD with the Be-LPT can provide earlier detection than is possible with other tests. In some cases this has led to treatment of CBD to reduce lung damage that would not have been possible if the CBD remained undiagnosed by other tests, such as chest X-ray. Researchers at the NJMRC compared the lung functions of patients with CBD who had been identified through abnormal chest X-rays or clinical symptoms to those of patients whose CBD had been identified through positive Be-LPTs (ref. 30). Twelve out of 21 Be-LPT-identified patients had lung abnormalities, including reduced exercise tolerance. Fourteen of 15 patients identified through chest X-rays or clinical symptoms had abnormal lung function, and their abnormalities were more severe. The authors concluded that the Be-LPT was useful because it permitted detection of affected individuals earlier in the disease process.

DOE's experience is consistent with this conclusion. The 79 cases of CBD diagnosed among Rocky Flats workers showed a range of severity. Thirty-nine individuals had symptoms that required treatment ranging from inhaled bronchodilators to corticosteroids to oxygen. Two individuals died of CBD. Seventy-three of the 79 cases were identified among individuals who had abnormal Be-LPT results but normal chest X-rays or pulmonary function screening test results. Clinical evaluations using computer aided tomography (CAT) scan, bronchoalveolar lavage-BeLPT (BAL Be-LPT), transbronchial biopsy, and gas diffusion studies of workers confirmed the presence of CBD in these workers.

There is no direct evidence that removal from exposure improves the prognosis of patients with CBD, because follow-up studies have not been done. However, beryllium does clear from the lung over time, and a reduced level of antigen in the lung should reduce the severity of the inflammation and the amount of lung damage (ref. 27). Additionally, members of the work force who are consistently positive on the Be-LPT are those most likely to eventually develop CBD. Treating physicians generally recommend that these individuals receive more frequent and more extensive pulmonary function testing so that the lung damage associated with CBD can be minimized through early detection and treatment. Sensitized and early CBD patients can be removed from jobs with beryllium exposure.

Finally, beryllium sensitization found through screening with the Be-LPT is the earliest indication that working conditions and work practices are affecting the health of exposed workers. This allows for an earlier opportunity to initiate corrective actions and possibly to prevent cases of CBD. Early detection enhances the contribution of medical surveillance to the management of the CBDPP.

II. Legal Authority and Relationship to Other Programs

Today's rule, which establishes minimum requirements for the protection of beryllium-associated workers, is promulgated pursuant to DOE's authority under section 161 of the Atomic Energy Act of 1954 (AEA) to prescribe such regulations as it deems necessary to govern any activity authorized by the AEA, specifically including standards for the protection of health and minimization of danger to life or property (42 U.S.C. 2201(i)(3) and (p)). Additional authority for the rule, insofar as it applies to DOE Federal employees, is found in section 19 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 668) and Executive Order 12196, "Occupational Safety and Health Programs for Federal Employees," (5 U.S.C. 7902 note), which require Federal agencies to establish comprehensive occupational safety and health programs for their employees.

DOE intends this final rule to be integrated with the existing worker protection management program for DOE Federal and contractor employees established by DOE Order 440.1A. The requirements in this final rule will supersede any conflicting provisions of DOE Order 440.1A on the effective date of the rule. On that date the rule also

will supersede DOE Notice 440.1, "Interim Chronic Beryllium Disease Prevention Program," established by then-Secretary Pena on July 15, 1997.

Some comments on the NOPR raised questions about the effect of the rule on collective bargaining and grievance-arbitration processes established by collective bargaining agreements. One union urged (Ex. 22) DOE to clarify whether the terms of this rule are subject to negotiation between a union and a contractor.

DOE has concluded that there is a compelling need for the CBDPP requirements in this final rule in order for DOE to meet its obligation under the AEA to protect the health of its employees and other workers at DOE facilities. The regulatory requirements of this rule will by operation of law apply to DOE contracts. Therefore, the application and enforcement of this rule are not subject to the Work Smart Standards Program or other related processes. DOE believes that this mandatory application of the CBDPP requirements to all DOE beryllium activities is appropriate given the hazardous nature of beryllium-related work.

While the minimum requirements in the rule are non-negotiable and may not be waived, the rule does not preclude all collective bargaining on matters related to beryllium exposure protections. Some rule provisions, such as the requirement for a beryllium exposure reduction and minimization provision in an employer's CBDPP, are performance-based and allow for negotiation between the employer and employee representatives. Other rule requirements, however, are stated in specific terms that do not permit any change. For example, section 850.24(e) of the rule specifies the accuracy that must be achieved by exposure monitoring of workers: not less than plus or minus 25 percent, with a confidence level of 95 percent, for airborne concentrations of beryllium at the action level. DOE's objectives of controlling worker exposure to airborne beryllium and obtaining better exposure data would be defeated if accuracy of monitoring were a subject of collective bargaining. Although today's rule may incidentally affect collective bargaining, it is neutral with respect to the balance of bargaining power of organized labor and management. The rule applies to all DOE contractors whether or not they are involved in collective bargaining.

This final rule is not being promulgated as a nuclear safety requirement under 10 CFR Part 820, Procedural Rules for Nuclear Activities, because beryllium generally is not a nuclear material. Any radiological implications of the two radioisotopic forms of beryllium would be addressed under the provisions of 10 CFR part 835, Occupational Radiation Protection.

III. Overview of the Final Rule

The final rule strengthens the worker protection program established under DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees (or DOE Orders 5483.1B, 5480.4, 5480.8A, and 5480.10 for operations not covered by DOE Order 440.1A), by supplementing the general worker protection program requirements with provisions that are specifically designed to manage and control beryllium exposure hazards in the DOE workplace. These hazard-specific provisions are derived largely from DOE Notice 440.1, "Interim Chronic Beryllium Disease Prevention Program," but a number of provisions have been modified as a result of DOE's consideration of comments received in the rulemaking.

Consistent with DOE Notice 440.1, this final rule establishes a CBDPP that is designed to reduce the occurrence of CBD among DOE federal and contractor workers and any other individuals who perform work at DOE facilities. The CBDPP will accomplish this disease-reduction mission through provisions that: (1) Reduce the number of current workers who are exposed to beryllium by clearly identifying and limiting worker access to areas and operations that contain or utilize beryllium; (2) minimize the potential for, and levels of, worker exposure to beryllium by implementing engineering and work practice controls that prevent the release of beryllium into the workplace atmosphere and/or capture and contain airborne beryllium particles before worker inhalation; (3) establish medical surveillance to monitor the health of exposed workers and ensure early detection that makes possible early treatment of disease; and (4) establish continual monitoring of the effectiveness of the program in preventing CBD and implementing program enhancements as appropriate. Another key purpose of the rule is the collection of consistent data, which will improve the information available to better understand the cause of CBD.

DOE has made numerous changes in the final rule after considering the public comments on the proposed rule. The principal changes are as follows:

- The final rule requires responsible employers to assign a qualified individual, such as a Certified Industrial Hygienist, to manage and supervise beryllium inventories, hazard assessments, and exposure monitoring.

- The final rule establishes the airborne beryllium concentration action level, which in this rule triggers key worker protection measures, at 0.2 $\mu g/m^3$, instead of 0.5 $\mu g/m^3$ as proposed. The STEL has been deleted, because the proposed STEL would not provide any added protection for workers given that the new action level of 0.2 $\mu g/m^3$ would be exceeded in less than 15 minutes where exposure levels are at 10$\mu g/m^3$.

- The final rule provides that responsible employers must require workers to use respirators in areas where the beryllium exposure level is at or above the action level, rather than at or above the PEL as proposed in the NOPR, and must provide a respirator to any worker exposed to beryllium who requests one, regardless of the concentration of airborne beryllium.

- The final rule includes criteria and requirements to govern the release of beryllium-contaminated equipment and other items at DOE sites for use by other DOE facilities or the public.

- The final rule requires responsible employers to offer medical surveillance to any "beryllium-associated worker," defined to include any current worker who is exposed through beryllium work or who had past exposure or potential exposure to beryllium at a DOE facility.

- The final rule contains medical removal protection and multiple physician review provisions that are modeled on provisions of three of OSHA's expanded health standards.

The provisions of the rule are presented in three subparts. Subpart A describes the purpose and applicability of the rule, defines terms that are critical to the rule's application and implementation, and establishes DOE and contractor responsibilities for executing the rule. Subpart B establishes administrative provisions requiring responsible employers to develop and maintain a CBDPP and to perform all beryllium-related activities according to the CBDPP. Subpart C establishes requirements for the content and implementation of the CBDPP. Some of the provisions of Subpart C apply only when it is determined that the airborne concentration of beryllium in a specific workplace or operation rises above a specified limit. Table 8 summarizes these provisions and indicates the levels of beryllium at which the provisions apply.

TABLE 8.—LEVELS AT WHICH THE PROVISIONS OF THE CBDPP APPLY

Provision	Worker exposure or potential exposure levels (8–Hour TWA)		
	Be operations/locations [1]	≥Action level (0.2 μg/m³)	≥PEL (8-hr TWA) (2.0 μg/m³)
Baseline Inventory (850.20)	X		
Hazard Assessment (850.21)	X		
Initial Exposure Monitoring (850.24)	X		
Periodic Exposure Monitoring (850.24)		X	
Exposure Reduction and Minimization (850.25)	X[2]	X[3]	X[4]
Regulated Areas (850.26)		X	
Hygiene Facilities and Practices (850.27)		X	
Respiratory Protection (850.28)	X[5]	X	
Protective Clothing and Equipment (850.29)	X[6]	X	
Housekeeping (850.30)	X[7]		
Release Criteria (850.31)	X[8,9]		
Medical Surveillance (850.34)	X[10]		
Training and Counseling (850.37)	X[11]		
Warning Signs (850.38)		X	

[1] Applies to beryllium operations and other locations where there is a potential for beryllium contamination.
[2] Responsible employers must implement actions for reducing and minimizing exposures, if practicable.
[3] Responsible employers must establish a formal exposure reduction and minimization program, if practicable.
[4] Responsible employers must reduce exposures to or below the PEL.
[5] Responsible employers must provide respirators when requested by the worker.
[6] Responsible employers must provide protective clothing and equipment where surface contamination levels are above 3 μg/100 cm².
[7] Housekeeping efforts must maintain removable surface contamination at or below 3 μg/100 cm² during non-operational hours.
[8] Removable contamination on equipment surfaces must not exceed 0.2 μg/100 cm² when released to the public or for non-beryllium use.
[9] Removable contamination on equipment surfaces must not exceed 3 μg/100 cm² when released to other beryllium handling facilities.
[10] Responsible employers must provide medical surveillance for all beryllium-associated workers.
[11] Training is required for all workers who could be potentially exposed. Counseling is required for beryllium-associated workers diagnosed with CBD or beryllium sensitization.

IV. Section-by-Section Discussion of Comments and Rule Provisions

This section of the Supplementary Information responds to significant comments on specific proposed rule provisions. It also contains explanatory material for some final rule provisions in order to provide interpretive guidance to DOE offices and DOE contractors that must comply with this rule. All substantive changes from the notice of proposed rulemaking (NOPR) are explained in this section. However, some non-substantive changes, such as the renumbering of paragraphs and changes to clarify the meaning of rule provisions, are not discussed.

DOE has determined that the requirements set forth in this final rule are those which, based on currently available data, are necessary to provide protection to workers who may be exposed to beryllium.

A. Subpart A—General Provisions

Section 850.1—Scope

The CBDPP required by this rule will enhance, supplement, and be integrated into existing worker protection program requirements for DOE Federal and contractor employees. DOE has structured the rule this way for two main reasons: (1) to take advantage of existing and effective comprehensive worker protection programs that have been implemented at DOE facilities; and (2) to minimize the burden on DOE contractors by clarifying that contractors need not establish redundant worker protection programs to protect workers from hazards of exposure to airborne beryllium.

Section 850.2—Applicability

As in the proposed rule, section 850.2 specifies that this rule applies to DOE offices and DOE contractors with responsibility for operations or activities that involve present or past exposure, or the potential for exposure, to beryllium at DOE facilities. It also applies to any current DOE employee, DOE contractor employee, or any other current worker at a DOE facility who is or was exposed or potentially exposed to beryllium at a DOE facility, regardless of which organization currently employs the worker.

Except at the few DOE-operated facilities, DOE federal workers are not usually directly involved in production tasks or other activities in which they would be exposed to airborne beryllium. However, in performing management and oversight duties, DOE federal workers may enter facilities where beryllium is handled. Federal agencies are required to ensure the protection of federal workers under the health and safety provisions of 29 CFR Part 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters," as well as Executive Order (EO) 12196, "Occupational Safety and Health Programs for Federal Employees." DOE's intent in section 850.2(a)(1) is to supplement these general worker protection requirements with specific beryllium-related requirements in the limited instances where DOE federal workers may have the potential for beryllium exposure.

Section 850.2(a)(2) specifies that the rule also applies to DOE contractors with operations or activities involving exposure or the potential for exposure to beryllium. As clarified in the definition of "DOE contractor" (section 850.3), DOE's intent is that the contractors covered under this rule include any entity under contract to perform DOE activities at DOE-owned or -leased facilities, including contractors awarded management and operating contracts, integrating contractors, and subcontractors. This section further clarifies that the requirements of the CBDPP apply only to contractors and subcontractors who work in areas or on DOE activities that involve the potential for worker exposure to beryllium.

The provisions of this rule do not apply to former DOE workers; to activities at DOE facilities that do not involve exposure or potential exposure to beryllium; or to activities not

conducted at a DOE facility, such as the off-site laundering of beryllium-contaminated protective clothing from a DOE site.

Section 850.2(b) exempts "beryllium articles" from the rule (see the definition of "beryllium article" under section 850.3). DOE recognizes that some beryllium-containing manufactured items may not pose beryllium hazards where they have been formed to specific shapes or designs and their subsequent uses or handling will not result in the release of airborne beryllium. This exemption for beryllium articles is consistent with the approach taken by OSHA in regulating hazardous materials under the Hazard Communication standard at 29 CFR 1910.1200.

Section 850.2(c) establishes that the rule does not apply to the DOE laboratory operations involving beryllium that are subject to the requirements of OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories standard, 29 CFR 1910.1450, commonly called OSHA's Laboratory standard. Three commenters (Exs. 30, 31, 32) opposed this exemption, stating that lesser protection would be afforded to laboratory workers than to those workers covered by the rule. One commenter (Ex. 30) suggested that laboratory exposures are difficult to predict and that a lack of sampling resulting from the perception that little hazard is present in laboratory settings may lead to incomplete exposure characterizations.

In establishing its Laboratory standard, OSHA clarified its intent that 29 CFR 1910.1450 supersede all other OSHA regulations for bench-top laboratory-scale activities, noting that the provisions of the standard were more relevant and suitable to the unique characteristics of laboratory activities. DOE agrees with OSHA's approach and believes that the provisions of OSHA's Laboratory standard are adequate to protect workers from beryllium exposures in facilities that fall within the scope of the standard.

DOE notes the laboratory exemption only applies in instances where relatively small quantities of beryllium are used in a non-production activity. In addition, OSHA's Laboratory standard has specific provisions to ensure that protective laboratory practices are followed. Many of the provisions in OSHA's Laboratory standard are the same as, or similar to, those in this final rule. For instance, OSHA's Laboratory standard establishes provisions for identifying the presence of hazardous chemicals (baseline inventory), establishing a chemical hygiene plan (hazard assessment), performing periodic monitoring at the action level, implementing exposure reduction measures at the PEL, training employees on related hazards, and providing employees the opportunity for medical consultation and examination. In part because each of these aspects of the beryllium rule is already included in the OSHA Laboratory standard, DOE has retained the laboratory operations exemption in section 850.2(b)(2).

Section 850.3—Definitions

Commenters on the proposed rule's "Definitions" section typically requested clarification or modification of the proposed definitions.

New terms. In response to public comment, the following additional terms have been defined in section 850.3: "beryllium-associated worker," "Head of DOE Field Element," "removable contamination," "responsible employer," and "unique identifier." A discussion of each term is included in the alphabetical listing of definitions provided below.

Terms and definitions deleted. In response to public comment, the following definitions in the NOPR are deleted in the final rule: "accepted applicant," "short term exposure limit (STEL)," and "surface contamination." The deletions are explained in the section-by-section discussion of the rule provisions in which the terms were previously used.

Section 850.3 defines key terms using traditional industrial hygiene terminology and terminology used by OSHA in its regulations. The use of such terminology is consistent with DOE's increased emphasis on industrial hygiene compliance through the use of accepted occupational safety and health requirements and procedures. The following discussion explains the definitions in the rule. Although some of these terms are commonly used, DOE believes that these definitions will help ensure that their meaning as used in the context of the rule is clear.

Action level means the level of airborne concentration of beryllium established pursuant to Subpart C, which, if met or exceeded, requires the implementation of certain specified provisions of the rule. Using an action level to trigger certain provisions of the rule is consistent with the approach applied in many of OSHA's substance-specific standards. The word "exceeded" was amended to read "met or exceeded" in the final rule to clarify DOE's intent that worker protection provisions must be implemented in cases where worker exposure levels are measured at, as well as above, the action level.

Authorized person means any person required by work duties to be in regulated areas. The concept of authorized person is consistent with OSHA standards and with contractor practice in many DOE facilities, and is intended to ensure that the population of potentially exposed individuals is reduced to the lowest possible number and that workers who are granted access to regulated areas have the knowledge they need to protect themselves and other workers. Under this rule, authorized individuals are to be trained in the hazards of beryllium and in the means of protecting themselves and those around them against such hazards. Training requirements for individuals working with beryllium are specified in section 850.37 of the rule. DOE did not receive any comments on this definition, which remains unchanged in the final rule.

Beryllium means elemental beryllium and any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater that may be released as an airborne particulate. This definition of beryllium reflects the focus of this rule on worker exposure to airborne beryllium. One commenter (Ex. 26) questioned whether exposure to naturally occurring beryllium compounds in excess of 0.1 percent was covered by the DOE program. However, as correctly noted by the same commenter, sections 850.2(a)(1) and (2) provide that the rule only applies to exposures and potential exposures to beryllium that occur in connection with facility operations. Another commenter (Ex. 10) suggested that 0.1 percent beryllium was too inclusive, and suggested that a level of 0.5 percent be used instead. DOE notes, however, that the concentration specified in the definition is consistent with the criterion that OSHA uses for a carcinogenic mixture, i.e., one that contains a carcinogenic component at a concentration of 0.1 percent (or 1,000 parts per million [ppm]) or greater, by weight or volume. Therefore, DOE has not changed the definition in the final rule.

Beryllium activity means an activity performed for, or by, DOE at a DOE facility that can expose workers to airborne concentrations of beryllium. Activities within the scope of this definition may involve design, construction, operation, maintenance, and decommissioning. The definition further explains that a "beryllium activity" may involve one DOE facility or operation, or a combination of facilities and operations. This definition

is broad enough to include activities such as repair work performed by support-service subcontractors who visit the site infrequently. DOE did not receive comments on this proposed definition. However, DOE modified the language to clarify that maintenance operations are within the scope of the term.

Beryllium article means a manufactured item that is formed to a specific shape or design during manufacture, that has end-use functions that depend in whole or in part on the item's shape or design, and that does not release beryllium or otherwise result in exposure to airborne concentrations of beryllium under normal use conditions. DOE has included this definition of "beryllium article" to distinguish between forms of beryllium that may result in exposure to airborne beryllium and manufactured items containing beryllium that do not release beryllium or otherwise result in exposure to airborne concentrations of beryllium. All of the persons (Exs. 9, 26, 30, 31) commenting on this definition agreed that exempting beryllium articles from the program is a logical approach. Two of these commenters (Exs. 9, 26) stated that an item destined for machining should be considered a beryllium article up to the time of that machining. In response to these comments DOE notes that the beryllium article definition is consistent with the approach employed by OSHA in formulating its definition of "article" in the Hazard Communication standard (29 CFR 1910.1200). The key concept is that an article, if used as intended, does not have the potential to result in hazardous exposures. However, an item ceases to be an "article" when it is subjected to machining, cutting, drilling, or similar action other than its intended end use. Similarly, if an item is manufactured for the purpose of being machined later, it is not considered an article. Another commenter (Ex. 31) suggested that examples of activities that could release beryllium, such as burning, grinding and chipping, be included in a parenthetical listing in the definition. DOE recognizes that there are many activities that could lead to a release, and is concerned that providing examples could be interpreted to exclude other activities. To avoid such confusion, DOE believes that examples should not be included in the definition, but rather should be included in a companion implementation guide for the rule.

Beryllium-associated worker means a current worker who is or was exposed or potentially exposed to airborne concentrations of beryllium at a DOE facility. This individual may be a DOE Federal or contractor worker, an employee of a subcontractor to a DOE contractor, or a visitor who, pursuant to a DOE-approved arrangement, performs work at a DOE facility. This definition clarifies DOE's intent that the rule applies only to current workers. The definition further clarifies that current workers who have been removed from beryllium exposure as part of the medical removal plan are beryllium-associated workers under the rule, but they are not "beryllium workers" (see definition of "beryllium worker").

Beryllium emergency means any occurrence such as, but not limited to, equipment failure, container rupture, or failure of control equipment or operations, that unexpectedly releases a significant amount of beryllium. This definition is particularly important when determining appropriate emergency response procedures that fall within the scope of OSHA's Hazardous Waste Operations and Emergency Response standard, 29 CFR 1910.120. This definition is based on OSHA's interpretation of the term "emergency" as applied in 29 CFR 1910.120 and refers to any untoward event, such as a major spill of powdered beryllium or an unexpected upset that releases a significant amount of beryllium into the workplace atmosphere. Two commenters (Exs. 24, 31) expressed concern that the term "significant release" was open to too much interpretation and needed further clarification. Emergency situations, by their very nature, are difficult to anticipate and describe. DOE believes that the examples listed provide a general indication as to what constitutes a significant release. The use of the term "beryllium emergency" is used in section 850.33, which requires DOE contractors to develop emergency procedures and training to address emergency scenarios.

Beryllium-induced lymphocyte proliferation test (Be-LPT) means an *in vitro* measure of the beryllium antigen-specific, cell-mediated immune response. This test measures the extent to which lymphocytes, a class of white blood cells, respond to the presence of beryllium by replicating in the laboratory. Medical personnel use the Be-LPT to identify workers who have become sensitized to beryllium through their occupational exposure. DOE did not receive any comments on this proposed definition, which remains unchanged in the final rule.

Beryllium worker means a current worker who is regularly employed in a DOE beryllium activity. Section 850.3 of the NOPR defined "beryllium worker" as "a current worker who is exposed or potentially exposed to airborne concentrations of beryllium at or above the action level or above the STEL or who is currently receiving medical removal protection benefits." This proposed definition included DOE Federal or contractor workers, workers employed by a subcontractor to a DOE contractor and visitors performing work at DOE facilities. Consistent with other provisions of the proposed rule, DOE intended this definition to apply only to current workers. DOE specifically stated in the NOPR that former workers would not be included in the proposed "beryllium worker" definition, but instead would be addressed under a separate initiative.

DOE received eight comments on the definition of "beryllium worker" in the proposed rule. Five commenters (Exs. 2, 14, 16, 17, 28) stated that the term beryllium worker was too limiting. These commenters argued that the proposed definition of beryllium worker should not be limited to those workers exposed to levels of beryllium at or above the action level, but rather should include all workers with the potential for beryllium exposure. Three commenters (Exs. 2, 14, 28) supported this position by noting that current scientific evidence does not suggest a "safe" level of beryllium exposure, and that CBD has been identified in individuals thought to have only low or incidental exposure to beryllium. DOE shares this concern, and has omitted the reference to the action level from the definition of "beryllium worker" in the final rule. DOE has revised the definition in the final rule to apply to each "current worker who is regularly employed in a DOE beryllium activity."

These same five commenters (Exs. 2, 14, 16, 17, 28) also argued that medical surveillance should be offered to all individuals with beryllium exposure and that the beryllium worker definition, therefore, should be expanded to include reassigned and former workers with prior beryllium exposure. These commenters were concerned that restricting medical surveillance to "beryllium-workers," as defined in section 850.3 of the proposed rule, would exclude workers with incidental beryllium exposure who also may be at risk of contracting CBD.

Two commenters (Exs. 2, 28) questioned the need for separate medical surveillance programs for former and current beryllium workers. These two commenters raised the issues of increased cost, lack of continuity, and the added confusion to participants associated with maintaining separate surveillance programs.

In response to these comments, DOE added the term "beryllium-associated worker," which is more inclusive than the term "beryllium worker." (See definition of "beryllium-associated worker.") The term "beryllium-associated worker" is used in provisions of the rule where DOE has determined that coverage should not be limited to workers regularly employed in DOE beryllium activities. Use of the term "beryllium-associated worker" clarifies DOE's intent that current employees with past beryllium exposures or potential exposures, as well as current individuals who are exposed to airborne beryllium at DOE facilities, be included under the following rule provisions: 850.5 (dispute resolution), 850.10 (development and approval of the CBDPP), 850.33 (medical surveillance), 850.34 (medical removal), 850.35 (medical consent), 850.36 (training and counseling) and 850.39 (beryllium registry).

DOE, however, has not expanded the definition to include former workers. DOE previously established the Former Beryllium Workers Medical Surveillance Program and offers medical examinations to former (retired and separated) workers who are at risk for developing CBD due to their work at DOE. The elements of the Former Beryllium Workers Medical Surveillance Program are: (1) identification of beryllium workers who have retired or separated from employment; (2) notifying workers of their eligibility to participate in the program, and general announcements to provide former workers an opportunity to self-identify as a former beryllium worker; (3) informed consent on the risks and benefits of participating in the program; (4) screening for CBD using the Be-LPT, a standardized questionnaire on respiratory symptoms, and a chest radiograph if indicated by responses to the questionnaire; (5) an offer of diagnostic medical examinations to individuals found to have either a positive Be-LPT or signs or symptoms of CBD; (6) periodic medical monitoring; (7) funds for medical care that is not covered by insurance; and (8) epidemiologic surveillance to identify high risk operations where additional primary preventative actions are needed.

One commenter (Ex. 23) took issue with the phrase "potentially exposed" in the proposed definition of "beryllium worker," arguing that it is too vague and could allow too much room for individual interpretation. DOE believes that limiting the definition to workers with actual personal exposure monitoring results at or above a specified airborne level would unnecessarily limit responsible employers' options for meeting the exposure monitoring requirements of this rule. For instance, if the phrase "potentially exposed" were removed from the definition, the use of representative sampling would no longer be an acceptable option for meeting the exposure monitoring requirements in the rule. Employers would be required to determine actual exposures for all workers to determine whether the workers are beryllium-associated workers. DOE believes that such an inflexible requirement would be burdensome and inconsistent with sound industrial hygiene practices and the provisions of section 850.21 of the rule, which requires qualified industrial hygienists to apply their professional knowledge and experience in the performance of beryllium hazard assessments. Accordingly, the final rule (in the definitions of "beryllium-associated worker" and "beryllium activity") requires responsible employers to consider potential exposures in identifying beryllium workers.

Another commenter (Ex.16) stated that the proposed definition of "beryllium worker," as applied in determining a worker's eligibility to participate in the medical surveillance program, could be too narrow in some respects and too broad in others. This commenter favored including current workers no longer working with beryllium and those with exposures below the action level in the definition of "beryllium worker." This commenter recommended allowing the industrial hygiene and medical staff to use a "graded approach" to determine which workers received medical surveillance, based on the needs of the individual and "common sense judgement about cost and benefit." DOE agrees that current workers no longer working with beryllium and those with exposures below the action level should be eligible for medical surveillance and, thus, has included such individuals in the final rule's definition of "beryllium-associated workers." DOE does not agree, however, that determining whether a worker should receive medical surveillance should be left to the discretion of the industrial hygiene and medical staff. DOE believes that such discretionary application of medical surveillance will result in an inconsistent level of protection for workers across the DOE complex. Therefore, section 850.34 of the final rule requires responsible employers to develop and implement a medical surveillance program for all beryllium-associated workers (see discussion of section 850.34).

Breathing zone is the hemisphere forward of the shoulders, centered on the mouth and nose, with a radius of 6 to 9 inches. This definition is used principally in section 850.24, Exposure Monitoring, which requires DOE contractors to determine worker exposures to beryllium by monitoring for the presence of contaminants in the worker's personal breathing zone. One commenter (Ex. 9) stated that this proposed definition was imprecise. DOE disagrees and views this definition as being consistent with sound and accepted industrial hygiene practice. It will ensure that samples collected for personal exposure monitoring represent the air inhaled by workers while performing their duties in affected work areas. Therefore, DOE has not revised this definition in the final rule.

DOE means the Department of Energy.

DOE contractor means any entity under contract with DOE, including a subcontractor, with responsibility for performing DOE activities at DOE-owned or -leased facilities. This term does not apply to a contractor or subcontractor who provides only "commercial items" as defined under the Federal Acquisition Regulations (FAR). Such contractors would not be performing DOE beryllium activities. As explained in the discussion of section 850.10, subcontractors who are covered under the rule normally will not be designated to prepare the written CBDPP for a site. However, these subcontractors will be included in the CBDPP that encompasses all beryllium-related activities at the site.

DOE facility means any facility operated by or for DOE, whether owned or leased by DOE.

Head of DOE Field Element is the high-level DOE official in a DOE field or operations office who has the responsibility for identifying the contractors and subcontractors covered by this part and for ensuring compliance with this part.

High-efficiency particulate air (HEPA) filter means a high-efficiency filter capable of trapping and retaining at least 99.97 percent of 0.3-micrometer monodisperse particles. Such filters are commonly used in heating and ventilating systems, respiratory protection equipment, local exhaust ventilation, etc., to remove toxic or hazardous particulates like beryllium.

Immune response refers to the series of cellular events by which the immune system reacts to a specific antigen. Types of immune responses include acquired immunity and sensitization.

The body's immune response to beryllium is sensitization and is indicated by the results of the Be-LPT.

Medical removal protection benefits are employment rights established in section 850.35 for beryllium-associated workers temporarily or permanently subject to medical removal from working in regulated areas following medical evaluations. These provisions give contractors an incentive to make reasonable efforts to find and offer alternate employment to workers who have suffered negative health effects due to exposure to beryllium. The definition of medical removal protection benefits and the requirements in section 850.35 ensure that such workers would suffer no reductions in total earnings, seniority, or other worker rights and benefits for two years after permanent medical removal. The two-year period for medical removal protection benefits after permanent removal will allow the contractor to make a reasonable effort to find alternate employment for a removed worker or, through job retraining and out-placement programs operated by many sites, to locate alternate outside employment for the worker.

Regulated area means an area demarcated and managed by the responsible employer where the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the action level (see the definition of "action level."). Employees working in regulated areas must be authorized to do so by the responsible employer, and must be trained and equipped with protective clothing and equipment. The purpose of such areas is to limit potential exposure to beryllium to as few workers as possible. Regulated areas are commonly used throughout DOE, particularly with regard to radiation protection, and their use is consistent with OSHA's expanded health standards for toxic particulates.

Removable contamination means beryllium contamination that can be removed from surfaces by nondestructive means, such as casual contact, wiping, brushing, or washing. This term was adopted from DOE's Radiological Control Manual, April 1994. One commenter (Ex. 23) stated that "surface contamination", a term defined in the proposed rule, should refer to contamination that is removable, not simply beryllium on surfaces. DOE agrees with this commenter that only removable surface contamination can become airborne and inhaled by workers, and has replaced the term "surface contamination" with "removable contamination."

Responsible employer means the DOE contractor office that is directly responsible for the safety and health of DOE contractor employees while performing a beryllium activity or other activity at a DOE facility; or for DOE employees, the DOE office that is directly responsible for the safety and health of DOE Federal employees while performing a beryllium activity or other activity at a DOE facility; and any person acting directly or indirectly for such office with respect to terms and conditions of employment of beryllium-associated workers. This definition is added to clarify DOE's intent that provisions of the final rule apply to both DOE Federal and contractor workers at DOE facilities.

Site Occupational Medical Director (SOMD) means the physician responsible for the overall direction and operation of the site occupational medicine program. DOE intends, through this definition, to ensure that a physician administers each DOE facility's occupational medicine program.

Unique identifier means a number or alphanumeric code used to identify each worker individually and distinctively while protecting the worker's privacy. Unique identifiers are used in DOE's health surveillance program to help identify the exposures each worker has experienced in the course of his or her work in a DOE facility without personally identifying the worker. The unique identifiers will allow DOE to link worker's exposure and occupational health data.

Worker means a person who performs work at a DOE facility including (but not limited to) a DOE employee, an independent contractor, or a DOE contractor employee. As clarified in the definition of "DOE contractor," an employee of a covered subcontractor is a contractor employee under this part.

Worker exposure means the airborne concentration of beryllium in the breathing zone of the worker that would occur if the worker were not using respiratory protective equipment. This definition is consistent with accepted industrial hygiene practice and with OSHA's definition of the term "employee exposure" as applied in the OSHA expanded health standards.

Section 850.4–Enforcement

DOE proposed that enforcement of the CBDPP requirements in Part 850 would be through contractual remedies, including contract termination or reduction in fee. Section 850.4 of the final rule adheres to this approach. This section provides that DOE may take appropriate steps under its contracts to ensure compliance with this rule, including (but not limited to) contract termination or reduction in fee.

One union commented (Ex. 22) that the proposed enforcement provision would be inadequate because DOE is not likely to terminate a prime contractor's contract for failure to comply with health and safety requirements, and because award fee reductions are only useful if the contracting officer is aware of, and qualified to investigate, noncompliance. The union requested that the rule be enforced under DOE's nuclear safety requirement enforcement procedures in 10 CFR Part 820 or pursuant to section 3131 of the National Defense Authorization Act for Fiscal Years 1992 and 1993 (42 U.S.C. 7274d). The union also suggested that while awaiting a compliance officer, a worker should have the right to shut down the job without loss of pay.

DOE has not adopted the commenter's recommendation to enforce this rule under 10 CFR Part 820 or section 3131 of the National Defense Authorization Act for Fiscal Years 1992 and 1993. Part 820, "Procedural Rules For DOE Nuclear Activities," contains procedures for enforcement of DOE nuclear safety requirements. Beryllium is not normally considered a nuclear material, and, therefore, enforcement of this rule would not fall within the scope of Part 820. DOE also cannot enforce this rule under section 3131 of the National Defense Authorization Act because that section's scope is limited, authorizing only the imposition of civil penalties against a DOE contractor for failing to train or certify to DOE the adequacy of employee training in hazardous substance response or emergency response (42 U.S.C. 7274d(b)).

In DOE's view, the existing mechanisms and contractual remedies available for enforcing DOE contractor worker protection programs are adequate for enforcement of this rule. For instance, under DOE Order 440.1A, DOE and, to the extent incorporated into contracts, DOE contractors are required to implement worker protection programs that ensure compliance with applicable health and safety requirements. The worker protection program must provide workers with certain rights, including, among other things, the right to accompany DOE worker protection personnel during workplace inspections on official time; the right to express concerns related to worker protection; to decline to perform an assigned task based on a reasonable belief that the task poses an imminent risk of death or serious bodily harm

when there is insufficient time to obtain redress through normal reporting and abatement procedures; the right to observe monitoring or measuring of hazardous agents and have access to the results of exposure monitoring; the right to be notified if monitoring results indicate they were overexposed to hazardous materials; and the right to receive results of inspections and accident investigations upon request. These provisions of DOE Order 440.1A continue to apply under the CBDPP.

Additionally, a contractor employee is protected from retaliation for a refusal to work under certain circumstances, as specified in an interim final rule that DOE promulgated on March 15, 1999, which substantially revises 10 CFR part 708, DOE Contractor Employee Protection Program (64 FR 12862 as amended at 64 FR 37396). An employee of a contractor (or a subcontractor) may file a complaint under the "whistleblower" regulations if he or she is subject to retaliation for refusing to participate in an activity based on a reasonable fear of serious injury (10 CFR 708.5(c)).

Section 850.5–Dispute Resolution

In the NOPR, DOE proposed that disputes arising under this part that are brought by beryllium workers be resolved through applicable grievance-arbitration processes or, if such processes are not available, through referral to the DOE's Office of Hearings and Appeals.

A union commented (Ex. 22) that the proposal to relegate a worker to the grievance and arbitration provision of the collective bargaining agreement would be inadequate because it erroneously assumes that an arbitrator would find a final rule to be part of the collective bargaining agreement. The union stated that unless DOE required employers to propose this rule, and unions accepted it as a contract condition, an arbitrator would decline to enforce this rule. The same commenter asked that DOE clarify in the final rule that an employee representative may file grievances under a collective bargaining agreement or seek other remedies under the labor laws to compel contractor compliance or deter contractor retaliation for seeking enforcement of the rule.

A DOE contractor (Ex. 23) expressed concern that proposed section 850.5 might interfere with existing dispute resolution processes, or might violate Federal law by imposing an obligation on the employment relationship between a DOE contractor and its employees who are subject to the terms of a collective bargaining agreement.

In proposing section 850.5, DOE sought to avoid creating opportunities for workers represented by labor organizations to circumvent collective bargaining agreement procedures for resolving disputes concerning terms and conditions of employment. Thus, DOE proposed that workers use available grievance-arbitration procedures for resolution of disputes related to the subject of this rule. However, DOE agrees with the comment that an arbitrator deciding a grievance under a collective bargaining agreement might not look beyond the collective bargaining agreement in making a decision. Because this rule establishes minimum requirements that are independent of collective bargaining agreements, available grievance-arbitration procedures may not in some cases be sufficient to ensure compliance with the rule.

DOE, therefore, has modified the text of section 850.5 to permit any adversely affected person to refer a dispute regarding compliance with the rule to the Office of Hearings and Appeals for resolution, but employees who are represented by a labor organization are required first to exhaust any grievance-arbitration procedure that is available for resolving disputes over terms and conditions of employment. This is the approach DOE took in its interim final rule for the DOE Contractor Employee Protection Program, 10 CFR part 708 (64 FR 12862, March 15, 1999). Consistent with section 708.13(a) of the Contractor Employee Protection Program rule, DOE has revised section 850.5 in the final rule to provide that a worker will be deemed to have exhausted all applicable grievance-arbitration procedures if 150 days have passed after the filing of a grievance and a final decision on it has not been issued.

B. Subpart B—Administrative Requirements

Subpart B of the final rule establishes general and administrative requirements to develop, implement, and maintain a CBDPP and to perform all beryllium-related activities according to the CBDPP.

Section 850.10—Development and Approval of CBDPP

Section 850.10 establishes the procedures for the development and approval of the CBDPP. Section 850.10(a)(1) requires a responsible employer in charge of DOE beryllium activities to prepare a CBDPP for its operations and submit the CBDPP to the appropriate Head of DOE Field Element for approval. This section establishes a 90-day time frame from the effective date of the rule for responsible employers' submission of the CBDPP to the appropriate Head of DOE Field Element. DOE is aware of the burden of documentation that can be generated by new programs. However, most responsible employers have already developed CBDPPs in response to DOE Notice 440.1. DOE expects the additional effort required to refine the existing CBDPPs to meet the requirements of the rule will be minimal.

Section 850.10(a)(2) requires that a single CBDPP be submitted to encompass all beryllium-related activities at a site. Because DOE recognizes that one site may encompass multiple contractors and numerous work activities, this section clarifies that the CBDPP for a given site may include specific sections for individual contractors, work tasks, etc. DOE believes that this allowance for a segmented CBDPP structure will minimize the burden associated with the CBDPP update and approval requirements because it allows individual contractors to update and submit for approval only the section of the CBDPP pertaining to their specific activities. If multiple contractors are involved, the DOE contractor designated by the Head of DOE Field Element must take the lead in compiling the overall CBDPP and coordinating the input from various other contractors, subcontractors or work activities. This section further clarifies that in such cases the designated contractor must review and approve the CBDPPs of other contractors engaged at the site before a consolidated CBDPP can be submitted to the Head of DOE Field Element for final review and approval.

One commenter (Ex. 31) stated that the rule did not clearly designate an "ultimate authority" responsible for designating physical areas covered by the rule. DOE notes that in sections 850.20 and 850.21, the responsible employer is assigned the responsibility of developing a baseline beryllium inventory and, where appropriate, conducting a beryllium hazard assessment. The actions effectively determine which areas of the facility are covered by the rule. DOE believes that the responsible employer is the most familiar with activities and operations that occur on a given DOE site and, thus, is best equipped to make this determination through the performance of the baseline beryllium inventory and hazard assessment.

Section 850.10(b) requires Heads of DOE Field Elements to review and approve CBDPPs. DOE believes that its review and approval is necessary to

ensure that each contractor's CBDPP is consistent with the requirements and objectives of this final rule. Through these sections, DOE hopes to establish clear lines of authority for review and approval of contractors' CBDPPs. One commenter (Ex. 23) was concerned that local approval of the CBDPPs by DOE field offices could lead to uneven enforcement and increased cost of compliance. DOE does not agree with this assessment, and believes that the Head of DOE Field Element is not only responsible for operations within his or her jurisdiction, but is also familiar with the operations and any related special circumstances or unique situations that may affect implementation or effectiveness of the CBDPP. Thus, DOE believes the Head of DOE Field Element is the most appropriate DOE approval authority for CBDPPs. DOE notes, however, that mechanisms exist to provide independent oversight of DOE's field organizations. Specifically, the Office of Oversight within the Office of Environment, Safety and Health is charged with providing information and analysis needed to ensure that DOE's top management officials, Congress and the public have an accurate and comprehensive understanding of the effectiveness, vulnerabilities, and trends of DOE's environment, safety, health, nuclear safeguards, and security policies and programs. DOE believes that this independent oversight will help assure consistency among CBDPPs across the complex.

Section 850.10(b)(1) establishes a 90-day period for DOE to review and either approve or reject the CBDPP. During its review, DOE may direct the contractors to modify the CBDPP. If DOE takes no action within 90 days, the initial CBDPP is considered approved. DOE established this 90-day time frame to facilitate timely implementation of program elements by responsible employers and to ensure that Heads of DOE Field Elements respond to responsible employers' submissions.

One commenter (Ex.18) stated that labor organizations should receive initial and updated CBDPPs. DOE notes that proposed section 850.10(b)(2) would require contractors to give interested DOE offices, affected workers, and designated worker representatives a copy of the CBDPP, upon request. This provision is retained in section 850.10(b)(2) of the final rule. This section ensures that workers and their representatives have access to information that is related to the protection of their health during the performance of DOE activities.

Section 850.10(c) requires responsible employers to update the written CBDPP in two circumstances: (1) whenever a significant change or addition is made to the program, and (2) whenever a contractor or subcontractor changes. DOE believes that such updates are warranted to ensure that the CBDPP accurately reflects workplace conditions and appropriately addresses specific workplace beryllium exposure hazards.

This section also requires that responsible employers review their written CBDPPs at least annually and revise these programs as necessary to reflect any significant changes. Only those sections of the CBDPP that require a change will have to be resubmitted to the Head of DOE Field Element for approval. DOE considers the annual review cycle to be appropriate and necessary to ensure that CBDPPs remain up-to-date and that they accurately reflect workplace conditions and required control procedures.

Section 850.10(d) ensures that CBDPPs are developed and implemented consistent with the requirements imposed by the National Labor Relations Act (NLRA), 29 U.S.C. 141 *et seq.*, on employers in this context, and not to create obligations in excess of those that would be found in such circumstances under the NLRA.

Section 850.11–General CBDPP Requirements

Section 850.11 establishes the general requirements of the CBDPP. Section 850.11(a) specifies that the CBDPP must address all existing and anticipated operational tasks that fall within its scope. In addition, the section requires all responsible employers to develop and implement a CBDPP that is integrated into DOE's existing worker protection program. By including this provision, DOE notes the importance of controlling beryllium hazards within the framework of the worker protection program established under DOE Order 440.1A (or, if applicable, under predecessor orders) and related DOE health and safety initiatives. The existing industrial hygiene and occupational medicine programs provide the basis for protecting DOE Federal and contractor workers from health hazards like beryllium exposure. DOE believes that establishing a beryllium exposure control program outside the framework of this accepted program may create redundant and potentially inconsistent requirements.

One commenter (Ex. 23) stated that the proposed requirement to specify in the CBDPP existing and planned operational tasks within the scope of the rule would not be feasible for decontamination and decommissioning (D&D) closure sites. This commenter argued that, due to the non-routine and unpredictable nature of D&D projects, identifying D&D tasks in the CBDPP would result in unnecessary costs, project delays, and administrative burdens because the CBDPP would have to be constantly updated. DOE strongly disagrees, and believes that identifying operational tasks within the scope of the CBDPP at D&D closure sites is practical and necessary. The non-routine and unpredictable nature of operations on D&D closure sites often makes such operations more hazardous than routine production operations involving beryllium. DOE believes that the appropriate way to protect workers from this increased hazard potential is through the implementation of the structured assessment, planning, and control provisions of the CBDPP. Based on experience under the interim CBDPP policy, DOE believes the CBDPP is feasible for D&D operations. DOE also notes that OSHA's Hazardous Waste Operations and Emergency Response standard, 29 CFR 1910.120, requires employers at hazardous waste remediation sites, in addition to conducting ongoing task-specific hazard analyses, to develop a site specific safety and health plan that addresses existing and planned activities. Thus, DOE has retained this requirement in the final rule.

Section 850.11(b) requires responsible employers to tailor the scope and content of their CBDPPs to the specific hazards associated with the DOE beryllium activities being performed. In addition, section 850.11(b)(1) requires that these programs include formal plans outlining how responsible employers will ensure that occupational exposures to beryllium are maintained at or below the PEL (8-hour TWA PEL of 2 $\mu g/m^3$).

Section 850.11(b)(2) further specifies that the responsible employer's CBDPP must, at a minimum, address each requirement in Subpart C of the rule. Section 850.11(b)(3) clarifies that the CBDPP provisions must focus on: (i) Minimizing the number of current workers exposed and potentially exposed to beryllium; (ii) minimizing the number of opportunities for workers to be exposed to beryllium; (iii) minimizing the disability and lost time experienced by workers due to CBD, beryllium sensitization, and associated medical care; and (iv) setting challenging exposure reduction and minimization goals to facilitate the minimization of worker exposures. DOE believes that the establishment of exposure reduction and minimization goals is essential to the success of the CBDPP and in moving toward the

ultimate goal of preventing CBD within the DOE complex.

DOE is sensitive to concerns that exist within its community regarding the need to approach exposure reduction and minimization objectives in a responsible and realistic manner. Accordingly, section 850.11(b)(3)(iv) establishes a performance-based requirement that will allow responsible employers to establish their own exposure reduction and minimization goals tailored to their unique workplace needs and conditions, subject to DOE review and approval pursuant to section 850.10(b). DOE intends for responsible employers to establish reasonable, but challenging, goals based on sound industrial hygiene principles and the specific circumstances for each affected DOE workplace and location. DOE expects responsible employers to consider, in establishing these goals, the current level of worker exposures, the number of workers exposed, the existing controls that are in place, the technical feasibility and exposure reduction potential of possible additional controls, and the cost and operational impact of the controls.

Section 850.12–Implementation

Proposed in section 850.12 required responsible employers to manage and control beryllium exposures in all DOE beryllium activities consistent with the approved CBDPP, the rule, or any other program, plan, schedule or other process established by this part, as well as requirements in other applicable Federal statues and regulations. One commenter (Ex. 16) believed that the preceding requirement should be changed to state that DOE and contractor personnel follow the CBDPP only. This commenter's concern was that including all applicable programs, plans, etc., was too broad. DOE agrees and has deleted including all applicable programs, plans, etc., from the final rule.

Section 850.12(c) clarifies DOE's position that tasks involving potential beryllium exposure that are not covered under the CBDPP may not be initiated until the CBDPP has been updated to include them and the updated plan has been approved by the appropriate Head of DOE Field Element. The rule provides an exception to this requirement for urgent and unexpected situations. In such cases, the task could proceed with the written approval from the Head of DOE Field Element prior to the CBDPP being revised and approved. One commenter (Ex. 16) sought clarification as to when a change in the CBDPP was required. This commenter proposed that when new beryllium activities require additional controls and/or procedures, a change in the CBDPP is warranted. Also, when new activities are within the range of potential exposures to beryllium as described in the existing CBDPP, the commenter suggested that no revision should be necessary. DOE's position is consistent with the views of this commenter. In general, only those activities outside the scope of the existing CBDPP would require a revision to the CBDPP.

Section 850.12(d) recognizes that, depending on the circumstances of the work, responsible employers may have to take other actions to protect their workers, and DOE does not intend to preclude such actions by the provisions of the rule. DOE recognizes that individuals responsible for implementing CBDPP activities must use their professional judgment in protecting the health and safety of workers. Nothing in the rule should be viewed as relieving these individuals of their professional responsibility to take whatever actions are warranted to protect the health and safety of the workforce.

Section 850.13–Compliance

Section 850.13(a) requires responsible employers to conduct DOE activities involving beryllium in compliance with their respective CBDPP that has been approved by the Head of DOE Field Element. Through this provision, DOE recognizes that even the best CBDPP will not adequately protect workers if it is not followed at the site. Section 850.13(b) requires that once the rule takes effect, responsible employers have 2 years to fully implement all aspects of the program (written plans, schedules, and other measures). Although DOE seeks to lessen the burden on responsible employers by permitting them to phase in costly controls over the 2-year period, DOE expects employers to implement portions of the program as soon as practical during the 2-year period.

Section 850.13(c) provides that the responsible employer in charge of an activity involving a potential for beryllium exposure is responsible for complying with the rule. When no contractor is responsible for the activity and Federal employees perform the activity, this section requires DOE to be responsible for compliance.

Subpart C—Specific Program Requirements

Subpart C of this rule establishes performance-based requirements for the CBDPP. These requirements are designed principally to prevent CBD by reducing the number of workers exposed to beryllium, minimizing the potential level of beryllium in the workplace atmosphere, and continually monitoring worker health to ensure that workplace controls are sufficiently protective. DOE expects implementation of the rule to increase its understanding of the development and course of CBD, which may lead DOE, at some future date, to propose modifications of this rule.

Section 850.20—Baseline Beryllium Inventory

Section 850.20(a) requires responsible employers to develop a baseline beryllium inventory. By developing the baseline inventory, responsible employers will accomplish the following functions that are critical to the success of the CBDPP: (1) Identification of locations and operations that should be physically isolated from other areas to prevent the spread of contamination, (2) identification of areas in which worker access should be restricted to minimize the number of workers who could be exposed, (3) identification of beryllium contamination that must be controlled in facilities that are scheduled for decontamination and decommissioning, (4) identification of beryllium contamination in facilities that are being used for non-beryllium activities, to determine the need for cleanup, and (5) the determination of which workers should be covered under the CBDPP.

Section 850.20(b) supplements the generic inventory requirement under DOE Order 440.1A by requiring responsible employers to review current and historical records, interview workers, and sample as necessary to document the characteristics and locations of beryllium at DOE sites. These supplemental requirements are necessary because those persons who are responsible for activities at DOE sites may not recognize that activities under their supervision involve beryllium or are conducted in areas where beryllium was used in the past. Workers often know of past beryllium activities for which no records exist. Sampling can identify beryllium contamination where the record reviews and worker interviews are not conclusive. These supplemental requirements are particularly necessary because past beryllium operations at DOE facilities were often conducted in uncontrolled work areas.

Section 850.20(b)(3) requires that responsible employers conduct air, surface, and bulk sampling procedures to characterize the beryllium. Characterizing the beryllium is

necessary to assess and control beryllium workplace hazards. Responsible employers should conduct the sampling that is appropriate for the specific workplace conditions and the suspected types and locations of beryllium contamination. Sampling techniques could include collecting area and wipe samples and collecting personal breathing zone samples. (Sections 850.24(a), (b), and (e)–(g) address the personal monitoring that may be a component of the baseline inventory.)

Section 850.20(c) requires responsible employers to ensure that individuals conducting the baseline beryllium inventory activities have sufficient qualifications in industrial hygiene. DOE believes that this provision is necessary to ensure that the inventory is accurate and complete. DOE requested in the NOPR that interested parties submit comments on the need to provide further specification in the rule regarding the minimum qualifications that an individual must possess to perform certain components of the CBDPP, such as hazard assessments and exposure monitoring. One alternative approach suggested was use of OSHA's "competent person" definition to define competency of the individual. Another alternative was to require that hazard assessments and exposure monitoring be performed by a "certified industrial hygienist" (CIH) as defined by the American Board of Industrial Hygiene (ABIH).

DOE received 14 comments in response to this request. Two of the 14 commenters (Exs. 4, 16) agreed with DOE's approach in proposed sections 850.20(c), 850.21(b) and 850.24(a). A commenter (Ex. 16) noted that if more prescriptive definitions are used to define personnel qualifications, the definitions should be appropriate to the required task. For instance, CIHs should conduct hazard assessments, while individuals possessing a lower level of knowledge should conduct exposure monitoring. Another commenter (Ex. 4) favored the use of OSHA's "competent person" definition over requirements for a CIH if DOE elected to use one of these more prescriptive definitions.

Two commenters (Ex. 20, 29) stated that the industrial hygiene competency requirements in proposed sections 850.20(c), 850.21(b) and 850.24(a) were too subjective and recommended instead, the use of OSHA's "competent person" definition. A commenter (Ex. 20) further noted that OSHA's Asbestos Standard, 29 CFR 1926.1101(b), included definitions for "competent person," "industrial hygienist," and "certified industrial hygienist" and outlined specific training courses that a competent person must complete. Two other commenters (Exs. 3, 31) favored the use of OSHA's "competent person" definition in lieu of the industrial hygiene competencies, but took exception to the last phrase of the definition: "and who has the authorization to take prompt corrective measures to eliminate [hazards]." The commenters were concerned that limiting the performance of assessments and monitoring to individuals with the authority to take prompt corrective actions would exclude other qualified individuals, such as third-party industrial hygienists.

Nine of the 14 commenters recommended that a CIH participate at some level in the performance of beryllium inventories, hazard assessments, and exposure monitoring. One commenter (Ex. 30) stated that monitoring and assessments must be performed by a CIH, while the other commenters (Exs. 3, 11, 13, 16, 19, 26, 28, 31) suggested that qualified and trained persons working under the direct supervision of a CIH could conduct these tasks, and that limiting the actual performance of monitoring and assessments to CIHs would be too restrictive and unnecessary. Although these commenters did not believe that a CIH is needed to actually perform monitoring and assessments, many did believe that minimum qualifications for those individuals performing these tasks must be specified in the final rule. For instance, one commenter (Ex. 11) recommended that DOE require that these individuals possess sufficient industrial hygiene experience in addition to knowledge. Another commenter (Ex. 13) suggested that a CIH, Industrial Hygienist in Training (IHIT) as defined by the ABIH, or person with "demonstrably equivalent qualifications" perform assessments and monitoring. Another commenter (Ex. 23) suggested that the industrial hygienist definitions in DOE's "Functional Area Qualification Standard," or as defined by AIHA, be used to prescribe the qualifications required to perform monitoring and assessments.

DOE agrees with the overwhelming majority of commenters who favored a more prescriptive definition. DOE believes that a more prescriptive definition will ensure proficiency and consistency in the conduct of assessments and monitoring as well as in the overall implementation of the CBDPP. Accordingly, DOE has provided language in sections 850.20(c), 850.21(b) and 850.24(a)(1) of the final rule for the use of qualified individuals such as a CIH to manage and supervise beryllium inventories, hazard assessments, and exposure monitoring, and the use of individuals with sufficient industrial hygiene knowledge and experience to actually perform these tasks. DOE believes this will provide the level of consistency required to ensure that hazards are properly identified and workers are appropriately protected without being overly prescriptive. In this regard, DOE agrees with the commenters who stated that the level of expertise needed to perform beryllium inventories, hazard assessment, and exposure monitoring does not require a CIH, and that such a requirement would cause an unnecessary resource strain on both DOE and its contractors.

Five persons commented on other provisions of the proposed baseline inventory section. Three of the commenters (Exs. 9, 21, 28) suggested that DOE provide in the final rule greater specificity than DOE proposed for baseline inventory requirements. DOE agrees with these commenters and in the final rule has modified the requirement for reviewing records to cover both current and historical records. The final rule also modifies the requirement for conducting sampling to specify air, surface, and bulk sampling. DOE believes that these changes clarify DOE's intent, express good industrial hygiene practice, and continue to allow the responsible employer appropriate flexibility in conducting the baseline inventory. One commenter (Ex. 9) suggested that DOE also specify in the final rule that baseline inventories include the locations where beryllium activities are planned. DOE considers locations where beryllium activities are planned to be locations of potential beryllium contamination and exposure that must be included in the baseline inventory under paragraph (a), and, therefore, no change is needed.

One commenter (Ex. 18) recommended that the final rule mandate the disclosure of health and safety documents related to past beryllium emissions and exposures. DOE has not included such a provision in the final rule because the Freedom of Information Act (5 U.S.C. 552) already provides for the release of federal government records, except for specified types of records that contain sensitive information, such as classified information relating to national defense or foreign policy, information in personnel and medical files, and trade secrets or other confidential business information. Requests to DOE for release of information related to past beryllium use and exposures may be submitted to the appropriate DOE field office. Such requests should follow DOE's

procedures for Freedom of Information Act requests in 10 CFR Part 1004. Also see the discussion of public access to beryllium records in the preamble discussion of section 850.39 (Recordkeeping and use of information).

The same commenter (Ex. 18) recommended that the final rule provide for independent review of the responsible employer's implementation of the CBDPP. DOE does not think that such a provision is necessary, because existing mechanisms already provide independent oversight of DOE's contractors and include independent oversight of DOE's field organizations. The DOE Office of Environment, Safety and Health's Office of Oversight is charged with providing information and analysis needed to ensure that DOE's top management officials, Congress, and the public have an accurate and comprehensive understanding of the effectiveness, vulnerabilities, and trends of DOE's environment, safety, health, nuclear safeguards, and security policies and programs. In addition, any interested individual or organization may conduct a review of a responsible employer's compliance with this rule based on information obtained from DOE.

One commenter (Ex. 14) recommended that the final rule provide funding for the baseline inventory, and contended that responsible employers will not conduct the baseline inventories unless the funding required for this task is explicitly established by the final rule. DOE does not require its contractors to perform unfunded tasks, but funding of DOE programs is appropriately handled through the federal government's budget process and not through the regulatory process. DOE expects that its program offices will request the funds needed to meet the obligations and objectives of their programs and activities, including compliance with the CBDPP.

Section 850.21—Hazard Assessment

Because the identification of the possible presence of beryllium in a workplace does not, in and of itself, suffice to determine whether a hazard exists or whether various control measures must be employed, section 850.21 of the final rule requires responsible employers to conduct a beryllium hazard assessment to characterize workplace beryllium exposure hazards. This requirement allows each site the flexibility to determine the appropriate risk-based approach for assessing beryllium-related hazards in its worksites where the baseline inventory has established that beryllium is present. As noted by one commenter (Ex. 25), flexibility in conducting hazard assessments is particularly important because operations, conditions, and the potential for exposure may vary greatly from operation to operation and facility to facility.

Section 850.21(a) requires the responsible employer to conduct an analysis of existing worksite conditions, exposure data, medical surveillance trends, and the exposure potential of planned activities. In addition, section 850.21(a) specifies that the responsible employer must prioritize potential exposure activities so that the activities with the greatest risks of exposure are evaluated first. DOE believes that prioritizing activities is a logical first step in initiating a hazard assessment. Targeting high-risk beryllium operations is an effective way to reduce potential beryllium exposures throughout DOE facilities.

Section 850.21(b) requires responsible employers to ensure that hazard assessments are managed by qualified individuals (e.g., a CIH), and that the individuals assigned to conduct hazard assessments have sufficient knowledge and experience to perform such activities properly. DOE requested in the NOPR that interested persons submit comments on the need to further specify in the rule the minimum qualifications that an individual must possess to perform certain key components of the CBDPP, such as hazard assessments. DOE received 14 comments in response to this request. As noted in the preamble discussion of section 850.20(c), 10 of the commenters either suggested or supported establishing an additional specification that hazard assessments be performed under the supervision of a CIH. DOE generally agrees with these commenters about the need for a qualified individual to manage hazard assessments and certain other tasks required by the rule. But DOE will not require that person to be in all cases a CIH. Thus, DOE provides in section 850.21(b)(1) that a qualified individual, such as a CIH, must manage hazard assessments performed for the CBDPP. By use of this language, DOE leaves open the possibility that a responsible employer, in a particular case, may determine that someone who is not a CIH possesses the requisite qualifications to manage the hazard assessments.

In addition to the comments on the CIH issue, DOE received only minor comments on section 850.21. One commenter (Ex. 21) suggested that the exposure potential of planned activities should be rank ordered to better focus each site's resources and efforts. DOE agrees with this commenter, and in the final rule has modified the requirement for hazard assessments to require the prioritization of beryllium activities, beginning with those activities that present the greatest risks of exposure. Another commenter (Ex. 30) was concerned about the use of existing data, such as exposure monitoring results, in the hazard assessment. While this commenter believed that using existing data is appropriate, the commenter warned against the potential for errors when relating existing data to current operations. In particular, this commenter suggested that existing data relating to exposure monitoring is often not well documented or is of poor quality, thus making it difficult to determine whether the sampling is representative of current beryllium operations. DOE agrees that existing data can be a valuable tool if collected and documented properly, and in many cases use of such data will expedite the hazard assessment process. At the same time, DOE also shares this commenter's concerns regarding the accuracy and applicability of existing data and has retained in section 850.21(b) the requirement for the hazard assessment to be managed by a qualified individual, such as a CIH. DOE's intent is that this requirement will help ensure that the data considered in the hazard assessment accurately reflects current site conditions and hazards.

Another commenter (Ex. 24) favored the triggering of a hazard assessment at detectable airborne beryllium levels from personal air samples. DOE agrees that if such data is available, it must be considered in the hazard assessment. As another commenter (Ex. 28) pointed out, however, a hazard assessment should not be limited to the inhalation risks posed by beryllium but must also include the presence and characteristics of beryllium contamination in a facility. Accordingly, the final rule requires the responsible employer to perform a hazard assessment whenever the baseline inventory establishes the presence of beryllium in an area.

Still another commenter (Ex. 11) requested that DOE include a non-mandatory appendix to the rule to provide guidance on how to perform a hazard assessment. This commenter was concerned that inexperienced industrial hygienists may be called upon to perform a hazard assessment, and suggested that additional guidance would be needed to assure accuracy and consistency. DOE believes this concern is addressed in section 850.21(b), which requires that hazard assessments be managed by qualified individuals, such as CIHs, and performed by individuals

with sufficient knowledge and experience to perform such tasks. Accordingly, DOE has not included the requested appendix to provide guidance on how to perform a hazard assessment as a part of this rulemaking.

Section 850.22—Permissible Exposure Limit

In the NOPR preamble, DOE reviewed the scientific evidence suggesting that the current OSHA 8-hour TWA PEL does not sufficiently protect worker health. However, DOE also stated that, in its view, it is difficult to determine from this scientific evidence the exposure level necessary to eliminate the risk of contracting CBD. For this reason, DOE retained the existing OSHA 8-hr TWA PEL in proposed section 850.22, and proposed other provisions to minimize worker exposure to airborne beryllium in DOE facilities. In addition, DOE included in proposed section 850.22 language providing that DOE would adopt a more stringent 8-hour TWA PEL if OSHA promulgated one through the rulemaking process. Finally, DOE requested in the NOPR that interested persons submit any compelling scientific evidence that would assist DOE in establishing a new, more protective exposure limit for DOE facilities.

Fifteen persons commented on the 8-hour TWA permissible exposure limit requirements in the proposed rule. Of these 15 commenters, four supported DOE's proposal to retain the OSHA 8-hour TWA PEL (Exs. 4, 19, 26, 29). One of these four (Ex. 29) took issue with DOE's conclusion that the existing OSHA PEL was not protective. This commenter pointed to the inaccuracies associated with the use of area monitoring data in referenced studies and the fact that most of the referenced studies acknowledged that infrequent exposures above the PEL had occurred within the study group. As a result, this commenter felt that the OSHA PEL should be retained as the exposure limit in DOE work places.

Two commenters cited DOE's policy established in DOE Order 440.1 to adopt the more protective of either OSHA's PEL or ACGIH's threshold limit value (TLV) and recommended that DOE adopt the ACGIH's proposed 8-hour TWA TLV of 0.2 $\mu g/m^3$ as the new DOE exposure limit (Exs. 28, 30). One commenter (Ex. 28) also supported adopting the proposed ACGIH TLV as an 8-hour TWA action level, which DOE has done in the final rule. (See section 850.23 in this Section-by-Section Discussion for further discussion of the action level.) Another commenter opposed adopting the proposed ACGIH limit and took issue with the policy in DOE Order 440.1A, stating that any new DOE limit should be subject to the rulemaking process (Ex. 16).

Five other persons suggested that DOE adopt one of a variety of lower exposure limits ranging from the limit of detection to the NIOSH Recommended Exposure Limit (REL), which is a ceiling limit of 0.5 $\mu g/m^3$. These commenters cited the occurrence of CBD among workers exposed to beryllium at levels below the 8-hour TWA PEL, and some of these commenters argued that studies presented in the Health Effects discussion of the NOPR provided a sufficient basis for the establishment of a new exposure limit. For example, one commenter (Ex. 35) cited two studies that evaluated the occurrence of CBD among the general population around a beryllium plant in Lorain, Ohio (refs. 5 and 6). Relying on these studies, this commenter suggested that the U.S. Environmental Protection Agency's ambient air criterion for beryllium of 0.01 $\mu g/m^3$ could be used as a basis for a new 8-hour TWA exposure limit. Two other commenters (Exs. 14, 24) cited the two Lorain, Ohio community studies, the occurrence of CBD among workers with beryllium exposures "well below the PEL," a study published in 1997 (ref. 31) which suggests that beryllium sensitization occurs at airborne beryllium exposure levels as low as 0.01 $\mu g/m^3$, and the DOE policy to provide a workplace free of recognized hazards (DOE Order 440.1A) to support their position that workers should not be exposed to any detectable level of beryllium. The remaining two commenters that offered suggestions for an alternative exposure limit agreed with DOE's conclusion that the OSHA 8-hour TWA PEL was not sufficiently protective and recommended adopting limits established by other occupational health groups. One commenter (Ex. 18) suggested that DOE adopt NIOSH's REL as a DOE exposure limit while the other (Ex. 22) suggested that DOE apply a safety factor of 4 to the ACGIH 8-hour TLV and use 0.05 $\mu g/m^3$ as the new DOE limit.

Two other commenters (Ex. 20, 32) agreed with DOE's conclusion that the OSHA 8-hour TWA PEL is not sufficiently protective and recommended that DOE establish a new exposure limit. These commenters, however, did not offer suggestions for alternative new exposure limits. Another commenter did not directly address DOE's proposal to retain the OSHA PEL, but instead recommended that DOE should consider the possible effects of particle size on the occurrence of CBD.

DOE has carefully considered each of these comments and available scientific data, and continues to believe that its original conclusion, as outlined in the proposed rule, remains valid. Specifically, DOE believes that existing scientific data indicates that there are reasonable grounds to conclude that the OSHA 8-hour TWA PEL for beryllium may not be sufficiently protective of worker health, a conclusion supported by 12 of the 15 commenters that addressed this section of the proposed rule. DOE is particularly influenced by the published studies (refs. 16–17, 21) indicating that workers exposed below the current PEL are contracting beryllium disease and exhibiting Be-LPT sensitivity. A recent article by Eisenbud (ref. 29) also concludes that it "appears" the current PEL is not protective enough.

However, DOE also believes, based on available scientific data, that it is difficult to determine the exposure level necessary to eliminate the risk of contracting CBD and, therefore, that the best approach to providing improved worker protection is through the establishment of a conservative 8-hour TWA action level, coupled with aggressive exposure reduction and minimization efforts, and the collection of medical surveillance data to better understand the cause of CBD. Accordingly, DOE has retained the OSHA 8-hour TWA PEL in section 850.22 of the final rule and has retained the action level concept of the proposed rule, although at a lower level (see section 850.23 discussion). Section 850.22 has been revised to simply reference 29 CFR 1910.1000, instead of specifying the current numerical limit. DOE intends this provision to result in the automatic incorporation of a more stringent PEL that OSHA may subsequently promulgate. This does not represent a substantive change to the provision as proposed.

In this rule, however, DOE has decided not to follow the policy under the more general worker protection program established by DOE Order 440.1A of adopting the more protective of either the OSHA PEL or the ACGIH TLV. The incorporation of any new ACGIH TLV in this rule would require that DOE conduct a rulemaking on the specific exposure level and present the scientific basis for public comment. As stated previously in this **SUPPLEMENTARY INFORMATION** section, DOE believes, based on the existing scientific evidence, that such a rulemaking is premature. By contrast, DOE may incorporate an OSHA PEL in this rule because the OSHA PEL is promulgated following notice and comment

rulemaking, and the rules of the Office of the Federal Register permit a reference to another part of the Code of Federal Regulations.

DOE proposed, in section 850.22(a) of the NOPR, to adopt the STEL established by the ACGIH of 10 μg/m³, averaged over a 15-minute sampling period. In the final rule the STEL has been deleted, because the proposed STEL would not provide any added protection for the worker given that the new action level of 0.2 μg/m³ would be exceeded in less than 15 minutes where exposure levels are at 10μg/m³. DOE did not seek to establish a lower STEL because, as in the case of a lower PEL, available scientific data do not provide a sufficient basis for the establishment of a new STEL.

Section 850.23—Action Level

DOE proposed in the NOPR to establish an 8-hour TWA action level of 0.5 μg/m³. In selecting the proposed action level, DOE considered a number of factors. DOE considered OSHA's substance-specific health standards, which typically establish action levels for hazardous and toxic substances at one-half the 8-hour TWA PEL. Applying this approach to beryllium would have resulted in a proposed 8-hour TWA action level of 1.0 μg/m³. OSHA's action levels are premised on the safety of its PELs, and are set to provide an additional margin of safety. As explained in the preceding discussion, however, there is a body of evidence suggesting that the OSHA PEL for beryllium does not adequately protect worker health. Therefore, DOE decided that a lower action level is appropriate for DOE facilities. According to the results of the 1996 DOE survey of DOE facilities which reported potential beryllium exposures, two DOE facilities (Pantex and Rocky Flats) had already employed an action level of 0.5 μg/m³. Another facility (Lawrence Livermore National Laboratory) reported the use of an "administrative warning range" of 0.2 to 2.0 μg/m³, which triggered a requirement for an investigation, and six DOE facilities employed an action level of 1.0 μg/m³. In light of this experience, DOE proposed adopting an action level at the lower end of existing DOE complex action levels (0.5 μg/m³), rather than follow the typical OSHA practice, in order to implement aggressive yet achievable exposure minimization.

The majority of comments received on the proposed rule agreed with the DOE's approach of using an action level that is lower than the typical OSHA action level, but called for an even lower level than DOE had proposed. The most commonly recommended level was 0.2 μg/m³, which is the same level as the ACGIH proposed TLV. Most commenters believed that this level would prevent additional cases of beryllium sensitization and disease. DOE believes that there is reasonable technical basis for selecting 0.2 μg/m³ as an action level, based on the following scientific analyses.

The U.S. Environmental Protection Agency's (EPA) Integrated Risk Information System includes a Reference Concentration of 0.02 μg/m³ for beryllium, which is "an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of noncancer effects during a lifetime" (ref. 33). This concentration is based on epidemiology studies. This continuous 24-hour per day, level translates into an 8-hour TWA level of 0.84 μg/m³.

Merrill Eisenbud conducted a study of CBD based on air sampling, atmospheric dispersion modeling, and analysis of a beryllium production plant's past operations. Eisenbud concluded that the lowest beryllium concentration at the 3/4-mile boundary, beyond which no community cases of chronic beryllium disease were found, was 0.025 μg/m³ during the 7-year period the plant operated at full capacity (ref. 29). This 24-hour per day level translates into an 8-hour TWA level of 0.84 μg/m³, which essentially is the same level that the EPA found to be without appreciable risk of causing noncancer effects (i.e., CBD).

The ACGIH, a professional organization that publishes occupational health consensus standards, has proposed to change its 8-hour TWA TLV from 2 μg/m³ to 0.2 μg/m³, based on its review of recent beryllium epidemiology studies (ref. 32).

The DOE recognizes that the EPA (0.84 μg/m³), Eisenbud (0.84 μg/m³), and ACGIH (0.2 μg/m³) levels are normally used as exposure limits rather than action levels. However, based on limitations of the studies done to date, the difficulties in determining a safe threshold level for occupational exposure to beryllium, and DOE's decision to implement aggressive exposure reduction and minimization efforts, DOE has decided that the most prudent course is to lower the action level to 0.2 μg/m³ rather than set a new exposure limit. The available science suggests that this level would be protective; is one-quarter of the EPA and Eisenbud levels and the same as the ACGIH proposed level. This is the lowest action or trigger level reported by any DOE facility under the interim CBDPP, and a lower level has not been demonstrated as being practicable. Lowering the action level to 0.2 μg/m³ will result in greater protection for the affected DOE work force by triggering additional monitoring, surveillance, respiratory protection, and other protective measures.

Benefits of lowering the action level. As specified in this rule, the action level triggers the use of a number of controls and protective measures designed to protect employees from exposures to beryllium, including:

- Periodic exposure monitoring (10 CFR 850.24 (c));
- Exposure reduction and minimization measure (10 CFR 850.25);[4]
- Regulated areas (10 CFR 850.26);
- Hygiene facilities and practices (10 CFR 850.27);
- Respiratory protection (10 CFR 850.28); and
- Protective clothing and equipment (10 CFR 850.29).

Thus, DOE sites where exposure levels exceed the action level would be required to implement these controls to provide further protection to workers exposed above the action level. This additional protection will reduce the exposure levels experienced by these workers, consequently reducing their risk of developing beryllium-related disease and other health effects. Setting the action level at 0.2 μg/m³, as opposed to 0.5 μg/m³, does not alter the set of controls that are triggered,[5] but does alter the timing of these additional controls. The additional protective measures triggered by the action level will be put into effect earlier. For example, consider an activity where airborne concentrations of beryllium start very low (below 0.2 μg/m³), but rise over time (e.g., over a course of days or weeks) in the workplace. Assume also that airborne concentrations will eventually exceed 0.5 μg/m³. If the responsible employer recognizes the potential for exposures to exceed the action level in this activity, this rule (as well as prudent industrial hygiene practice) would require the responsible employer to conduct exposure

[4] The rule does not require that exposure reduction and minimization efforts (e.g., engineering controls and work practices) be triggered by the action level. DOE expects, however, that affected sites will specify that some engineering controls and work practices be triggered by the action level in their CBDPP plans.

[5] DOE did alter the set of controls that are triggered by the action level between the proposed and the final rule. This, however, was not done as a result of setting a lower action level, but was in response to comments on the proposed rule.

monitoring to determine if and when the action level is exceeded. In this situation, once the 0.2 μg/m³ threshold is crossed, the responsible employer would be required to implement the controls specified above, and workers would benefit from the additional protection provided by those controls. Under an action level of 0.5 μg/m³, protective measures would not be implemented until the airborne concentrations exceeded 0.5 μg/m³. Thus, during the time that exposures are between 0.2 μg/m³ and 0.5 μg/m³, workers would not be afforded the additional protection of the triggered controls. Thus, the first incremental benefit of setting the action level lower is the reduction in risk afforded by the controls triggered during the time that exposures are between 0.2 μg/m³ and 0.5 μg/m³ (See Table 9).

The second benefit from setting the action level lower is to expand the number of workers afforded the additional controls (See Table 10). DOE believes there are a number of workers exposed to airborne concentrations of beryllium between 0.2 μg/m³ and 0.5 μg/m³, but who are never exposed above 0.5 μg/m³. DOE estimates that between 342 and 460 workers may be exposed at these levels.[6] Under an action level of 0.5 μg/m³, these workers would not be afforded the protection of controls triggered by the action level. Under an action level of 0.2 μg/m³, however, these workers are afforded the additional controls. These additional controls will reduce the exposures faced by these workers, leading to a reduction in their risk of developing beryllium-related disease and other health effects. Thus, the second benefit of using the lower action level is a reduction in risk among workers exposed to airborne concentrations between 0.2 μg/m³ and 0.5 μg/m³.

Quantitative estimates of the reduction in risk and the consequent reduction in the incidence of beryllium-related disease and other health effects are not possible due to a lack of necessary information. As discussed in this preamble and the Economic Analysis (Chapter 1, Section 1.1), no quantitative dose-response relationship has been defined for beryllium. Without this information, DOE is unable to provide a quantitative estimate of the benefit of using a lower action level. Nevertheless, DOE believes that the use of 0.2 μg/m³ action level as opposed to the 0.5 μg/m³ is justified based on the benefits discussed above and the number of comments that suggested that an action level lower than 0.5 μg/m³ is necessary.

Other issues. This revision to the final rule does not accommodate the comments (Exs. 12, 18, 32) that urged DOE to lower its action level to any detectable level of beryllium. DOE believes it would not be practicable to use any detectable level of beryllium as its action level because beryllium is ubiquitous; it can be detected virtually anywhere if a sufficiently large air sample is taken. Furthermore, according to the EPA's Integrated Risk Information System, discussed above, the United States population is being exposed to detectable background levels of beryllium without an appreciable risk of contracting CBD in their lifetime. Therefore, that level is not supported by the available science.

TABLE 9.—COMPARATIVE COST ANALYSIS FOR DIFFERENT ACTION LEVELS

Category/requirement	Annualized cost for 0.2 μg/m³ action level (final rule)	0.5 μg/m³ action level		0.1 μg/m³ Action level	
		Annualized cost	Difference from 0.2 μg/m³ action level	Annualized cost	Difference from 0.2 μg/m³ action level
Requirements Triggered By The Action Level in the Final Rule:					
Periodic exposure monitoring	$1,962,620	$1,104,421	($858,199)	$3,574,937	$1,612,317
Notify workers monitoring results	66,932	40,411	(26,521)	82,104	15,171
Exposure reduction and minimization	2,707,636	[2] 2,707,636	0	3,579,513	871,877
Regulated areas	0	0	0	8,496	8,496
Change rooms and showers	249,730	249,730	0	272,337	22,607
Respiratory protection	9,085	9,085	0	342,495	333,410
Protective clothing	0	0	0	382,528	382,528
Disposal of protective clothing	0	0	0	42,738	42,738
Subtotal	4,996,004	4,111,284	(884,720)	8,285,149	3,289,144
Other Requirements	26,555,397	26,555,397	0	26,555,397	0
Total for all requirements [1]	31,551,401	30,666,680	(884,720)	34,840,545	3,289,144

Note: Column totals may contain some rounding error.

[1] For this row, the annualized cost represents the annualized cost of the proposed rule for the specified action level.

[2] The costs for exposure reduction and minimization may be lower with a 0.5 μg/m³ action level since fewer requirements would be triggered under the higher action level. The information provided to DOE by the sites, however, did not contain enough information to make an estimate of the reduction in the costs for this category.

[6] The lower bound estimate (342) is the difference between the number of workers exposed above the 0.5 μg/m³ action level estimated in the Economic Analysis (EA) for the proposed rule (894 workers) and the number of workers exposed above the 0.2 μg/m³ action level estimated in the EA for the final rule (1,236 workers). The estimates contained in the two versions of the EA are not, however, completely comparable. In developing the EA for the final rule, DOE obtained new data from the sites on the number of workers exposed above 0.2 μg/m³. For some sites, the reported number of workers exposed above 0.2 μg/m³ was less than DOE's previous estimate of the number exposed above 0.5 μg/m³. To correct for this inconsistency, DOE used the minimum of the two estimates for each site as an estimate of the number exposed above 0.5 μg/m³. This resulted in an estimated 776 workers exposed above 0.5 μg/m³. The difference between this new estimate and the estimated number exposed above 0.2 μg/m³ (1,236 workers) provides the upper bound estimate (460 workers).

TABLE 10.—ESTIMATED NUMBER OF WORKERS BY EXPOSURE LEVEL

Beryllium exposure levels (μg/m³)	Estimated number of workers [1]	Percent of all affected workers
0.0 to 0.1	0	0
0.1 to 0.2	398	24.4
0.2 to 0.5	342 to 460	20.9 to 28.2
Above 0.5	776 to 894	47.5 to 54.7
Total	1,634	100
Total Above 0.1	1,634	100
Total Above 0.2	1,236	75.6

[1] The Economic Analysis (EA) for the final rule estimates that 1,236 workers are exposed above the action limit of 0.2 μg/m³ and that a total of 1,634 workers are currently exposed to beryllium. Thus, 398 workers must be exposed below 0.2 μg/m³ (398 = 1,634 − 1,236). Given that measurements of exposure levels below 0.1 μg/m³ begin to near the detection limits, DOE assumes that all workers exposed below 0.2 μg/m³ would be in the 0.1 to 0.2 group. Next, DOE estimated the upper bound of the above 0.5 group by taking the estimated number of workers exposed above 0.5 μg/m³ from the EA for the proposed rule (i.e., 894 workers). The difference between this number and 1,236 (the number exposed above 0.2 μg/m³) provided the lower bound of the 0.2 to 0.5 group (342 = 1,236+894). To provide the lower bound of the above 0.5 group (776 workers), DOE corrected for an inconsistency between the EA for the proposed rule and the EA for the final rule. In developing the EA for the final rule, DOE obtained new data from the sites on the number of workers exposed above 0.2 μg/m³. For some sites, the reported number of workers exposed above 0.2 μg/m³ was less than DOE's previous estimate of the number exposed above 0.5 μg/m³ (in the EA for the proposed rule). To correct for this inconsistency, DOE used the minimum of the two estimates (i.e., the estimated number of workers exposed above 0.2 μg/m³ in the EA for the final rule and the estimated number of workers exposed above 0.5 μg/m³ in the EA for the proposed rule) for each site as an estimate of the number exposed above 0.5 μg/m³. This resulted in an estimated 776 workers exposed above 0.5 μg/m³ which DOE uses as the lower bound for that group. The difference between this number and the estimated number exposed above 0.2 μg/m³ (1,236 workers) provides the upper bound estimate for the 0.2 to 0.5 group (460 = 1,236 − 776).

NOTE: Column total may contain some rounding error.

Section 850.24—Exposure Monitoring

Section 850.24 establishes CBDPP worker exposure monitoring requirements. The exposure monitoring provisions in this section are necessary to determine the extent of exposure at the worksite; prevent worker overexposure; identify the sources of exposure to beryllium; collect exposure data so that the responsible employer can select the proper control methods to be used; evaluate the effectiveness of selected controls; and provide continual feedback on the effectiveness of the program in controlling exposures. These requirements are more specific than the provisions of exposure monitoring in DOE Order 440.1A.

Exposure monitoring is important not only to determine the level of beryllium to which workers are exposed and the frequency at which workers should be monitored, but also to determine whether other protective provisions of the rule need to be implemented. The employer's obligation to provide respiratory protection under section 850.28, for example, is triggered by monitoring results showing that a worker is exposed at or above the action level. Exposure monitoring results also may help DOE to resolve uncertainties regarding the adequacy of the existing beryllium PEL and to refine the requirements of this rule as needed to protect worker health.

Because of the importance of adequately characterizing and monitoring worker exposures to beryllium, DOE included a specific request in the NOPR asking interested persons for views or information on the need for daily exposure monitoring of all beryllium workers. DOE was considering whether daily exposure monitoring was needed to document and characterize more completely a worker's exposure to beryllium, and to better evaluate the adequacy of existing exposure levels or determine appropriate levels for alternative exposure limits. Of the ten commenters who responded to this request for information, three favored a daily monitoring requirement while seven were opposed.

The commenters who favored daily monitoring for all workers (Exs. 18, 25, 30) argued that daily monitoring of each worker would more accurately document and characterize beryllium exposures. One commenter (Ex. 16) suggested that initial daily monitoring could be replaced with periodic monitoring after sufficient data was obtained. Another (Ex. 30) noted that daily exposure monitoring might be the only accurate way to determine exposures during changing workplace conditions. This commenter suggested that daily monitoring is important in identifying specific work activities that contribute to the worker exposures.

The majority of commenters responding to this request (Exs. 3, 4, 16, 17, 26, 28, 29) objected to daily monitoring of all workers to determine beryllium exposures. These commenters stated that daily monitoring would generate large amounts of data, at great cost, while producing little or no added benefit. Some of these commenters (Exs. 3, 26, 28, 29) favored representative sampling of the workplace, using statistical analysis to determine the number of samples required. These commenters asserted that the principal benefits of a statistically-based monitoring strategy would be the reduction in the number of samples needed and resources used.

After considering all of the comments, DOE agrees that daily monitoring would be unnecessarily burdensome for responsible employers, and that a statistically-based approach will ensure the adequate characterization of worker exposures. This position is reflected in section 850.24(b), as discussed below.

Section 850.24(a) requires that exposure monitoring be managed by a qualified individual such as a CIH, and conducted by individuals with sufficient industrial hygiene knowledge and experience. DOE requested in the NOPR that interested persons submit comments on the need to further specify the minimum qualifications that an individual must possess to perform certain key functions under the CBDPP, including exposure monitoring. Most of the commenters suggested or supported adding a requirement that exposure monitoring be performed under the supervision of a CIH. DOE agrees that a CIH is often best qualified to manage exposure monitoring activities, and provides in section 850.24(a)(1) that exposure monitoring performed for the CBDPP be managed by a qualified individual, such as a CIH. However, in keeping with the performance-based philosophy underlying this rule, DOE

does not preclude a responsible employer from determining, in a particular situation, that a person other than a CIH possesses the requisite knowledge to perform this function. Most of the commenters were of the view that individuals conducting the monitoring, under the management of a qualified individual, need sufficient knowledge and experience but not necessarily the same level of qualification as a CIH.

Section 850.24(b) requires the responsible employer to perform initial exposure monitoring for all persons who work in areas that may have airborne concentrations of beryllium, as determined through the baseline beryllium inventory and hazard assessment. The responsible employer must employ a statistically-based monitoring strategy to obtain the number of samples needed to characterize worker exposures. The initial exposure information is necessary to determine the need for engineering and work practice controls, to select appropriate personal protective clothing and respiratory protective equipment where needed, and to identify the need to establish regulated areas. One commenter (Ex. 28) recommended that sampling should be conducted to determine particle size and chemical characterization of the potential exposure, and another commenter (Ex. 30) recommended use of particle size-selective personal monitoring. DOE has decided to leave details of this nature to the qualified individual who manages exposure monitoring under the CBDPP, rather than attempt to prescribe them in regulations. This type of issue also may be addressed in future DOE guidance on implementing the CBDPP.

Section 850.24(b)(1) requires the responsible employer to determine the beryllium exposure of workers by collecting personal breathing zone samples that reflect worker's exposure to airborne concentrations of beryllium over an eight-hour period. As specified in the definition of "worker exposure" in section 850.3, this is a measurement of the exposure that would occur if the worker were not using respiratory protective equipment. Section 850.3 also includes a definition of "breathing zone," which means "a hemisphere forward of the shoulders, centered on the mouth and nose, with a radius of 6 to 9 inches." Thus, a breathing zone sample is taken as close as practical to the nose and mouth of the worker. For a full description of breathing zone samples, see OSHA's Instruction CPL 2–2.20B, CH–1, Nov. 13, 1990.

DOE recognizes that many of its responsible employers may have performed initial monitoring as part of their efforts to implement DOE Notice 440.1. DOE does not intend to require employers to repeat these efforts if they are adequate under the rule. Accordingly, section 850.24(b)(2) allows employers to use initial monitoring data collected within 12 months before the effective date of this rule to satisfy the rule's initial monitoring requirements. One commenter (Ex. 31) cautioned DOE that any sampling performed prior to the issuance of the final beryllium rule should only be accepted by DOE if the work conditions during the sampling period are the same as current conditions. DOE agrees with this commenter, and notes that several provisions of the final rule require responsible employers to ensure that sampling results reflect current workplace conditions. Specifically, section 850.24(b) requires that the responsible employer obtain a sufficient number of sample results to adequately characterize exposures, and section 850.24(d) requires that the responsible employer perform additional monitoring if operations, maintenance, or procedures change, or if the responsible employer has any reason to suspect a change has occurred which may result in new or additional exposures. Further, DOE believes that the requirement that exposure monitoring be managed by a qualified individual will help assure that exposure monitoring results accurately characterize worker exposures.

Section 850.24(c) requires the responsible employer to conduct periodic exposure monitoring of workers who work in areas where airborne concentrations of beryllium are at or above the action level. Periodic monitoring provides the responsible employer with assurance that workers are not experiencing higher exposures that may require the use of additional controls. In addition, periodic monitoring reminds workers and responsible employers of the continued need to protect against the hazards associated with exposure to beryllium. The collection of exposure monitoring data also enables the SOMD to be informed of the existence and extent of potential sources of beryllium exposure.

Some commenters argued that the periodic monitoring requirements in the rule should be more conservative than proposed in the NOPR. For instance, one commenter (Ex. 13) recommended that the requirement for periodic monitoring be implemented if employee exposures exceed 10% of the PEL while another commenter (Ex. 18) suggested that periodic monitoring be required for all workers regardless of previously measured exposures. DOE has addressed the first commenter's concerns by establishing the action level in the final rule at no greater than 0.2 $\mu g/m^3$ (ten percent of the PEL). DOE does not believe that periodic monitoring should be mandated for all workers regardless of exposure level, as suggested by the other commenter, but rather that the responsible employer should determine the frequency of periodic monitoring where levels are below the action level. However, DOE does encourage sites to establish lower action levels to trigger components of their CBDPP, as part of their exposure reduction and minimization efforts required under section 850.25.

A third commenter (Ex. 14), addressing the periodic monitoring requirements of proposed section 850.24(c), stated that periodic monitoring on a continuous basis is the only way to determine worker exposures. While DOE acknowledges that certain operations may warrant continuous monitoring due to the dynamic nature of day-to-day operations, DOE believes that an inflexible, one-size-fits all monitoring policy is inappropriate due to the wide range of beryllium-related operations within the DOE complex. Accordingly, DOE provides responsible employers the flexibility to determine the monitoring frequency that is needed to sufficiently characterize worker exposures. DOE believes that responsible employers are best positioned to evaluate the potential variability of worker exposures in their operations and to tailor their periodic monitoring approaches as appropriate. Nevertheless, because slight process or procedural changes may go unnoticed over time and because equipment maintenance, aging, or deterioration can affect performance, DOE, in section 850.24(c), is requiring a minimum exposure monitoring frequency of every 3 months (quarterly) for workers who are exposed to airborne concentrations of beryllium at or above the action level.

DOE recognizes that the minimum quarterly monitoring of workers exposed at or above the action level is more frequent than is required in most OSHA expanded health standards. However, DOE considers this minimum monitoring frequency to be necessary due to the uncertainties regarding the adequacy of the current PEL. To supplement this periodic monitoring requirement, section 850.24(d) requires that responsible employers perform additional exposure monitoring when beryllium-related operations or

procedures change, or they have any reason to suspect a change, which may cause new or additional exposures to workers. This additional monitoring is needed to protect workers from elevated exposures resulting from changed circumstances, to quantify how changes affect worker exposure to airborne beryllium, to ensure the continued effectiveness of existing engineering and work-practice controls, and to identify the need for additional control measures to minimize worker exposure to beryllium.

To obtain accurate exposure monitoring results, section 850.24(e) requires that responsible employers use monitoring and analytical methods that have accuracy, at a confidence level of 95 percent, of not less than plus or minus 25 percent for airborne concentrations of beryllium at the action level. The main reason DOE is requiring this degree of accuracy for exposure monitoring results is to ensure that exposure monitoring results are sufficiently accurate at the exposure level that is relevant for the CBDPP. Accuracy of measurements is critical, since certain central requirements of the rule (e.g., engineering controls, exposure reduction and minimization, respirator use, and regulated areas) are triggered by measured worker exposures that meet or exceed the action level. In addition, the medical removal provision requires that a removed worker not be placed in a job where exposure levels are at or above the action level.

Section 850.24(f) further ensures the quality of monitoring results by requiring that all laboratory analyses of air sampling data be performed in a laboratory accredited for metals by the AIHA, or a laboratory that demonstrates quality assurance for metals that is equivalent to AIHA accreditation. Equivalency to AIHA's accreditation means that a laboratory can demonstrate that their testing protocols meet the accreditation standards of AIHA. These accuracy and quality requirements are consistent with similar requirements that appear in many of OSHA's expanded health standards for toxic substances. The only commenter (Ex. 13) to address this issue agreed with DOE that the use of an AIHA accredited laboratory will ensure the quality control, consistency, and accuracy of beryllium sample analyses. DOE has added to the final rule the language "or a laboratory that demonstrates quality assurance for metals analysis that is equivalent to AIHA accreditation," to provide responsible employers more flexibility in selecting a laboratory and to allow the use of an appropriate laboratory currently being used by the employer.

Section 850.24(g)(1) requires responsible employers to notify affected workers of monitoring results, in writing, within 10 working days of receipt of the monitoring results. This section also provides responsible employers with two alternative methods of worker notification: (1) written notification to each affected worker, or (2) posting of monitoring results in a location or locations readily accessible to affected workers. Two commenters (Exs. 16, 23) expressed concern about the use of personal identifiers in posted monitoring results, citing worker privacy concerns.

One commenter (Ex. 26) objected strongly to DOE's proposal to provide notice to workers in a manner that does not identify the worker. This commenter argued that not only is there no right to privacy implicated by posting of sampling results, but that anonymous notification would not further personal accountability for work practices. This commenter cited the Atomic Weapons Establishment's (AWE) experience at its Cardiff (United Kingdom) facility to show the beneficial effects of peer pressure on individual workers' adherence to good work practice. DOE recognizes AWE's experience and the benefits of peer pressure on workers' adherence to good work practices. However, DOE is following the approach used in OSHA's substance-specific standards that have posting requirements, which does not incorporate the principle of applying peer pressure to establish good work practice procedures. DOE, therefore, provides in the final rule that when the posting option is selected, responsible employers must post the results without disclosing the identity of the affected workers. This protection of workers' privacy is consistent with OSHA's substance-specific standards that have posting requirements.

Sections 850.24(g)(2) and (3) deal with cases in which monitoring results indicate that the worker exposure level meets or exceeds the action level. In such cases, the responsible employer is required by paragraph (g)(2) to include in the notice to workers a description of the corrective actions being taken to reduce worker exposure to below the action level. Paragraph (g)(3) requires the responsible employer to notify the SOMD of the results within 10 working days of receipt of the monitoring results. DOE believes that the SOMD must be informed of such exposures in order to refine, as appropriate, the medical surveillance protocol for affected workers to ensure effective monitoring and early detection of beryllium-related health effects.

Section 850.25—Exposure Reduction and Minimization

Section 850.25 establishes the exposure reduction and minimization provisions of the CBDPP that reflect DOE's goal of achieving aggressive reduction and minimization of worker exposures to airborne beryllium.

Section 850.25(a) establishes the baseline requirement that responsible employers ensure that no worker is exposed to airborne beryllium at levels above the exposure limit established in section 850.22.

Section 850.25(b)(1) requires the responsible employer to include in the CBDPP a formal exposure reduction and minimization program to reduce exposure levels that are at or above the action level to below the action level, if practicable. Sections 850.25 (b)(1)(i)-(iv) provide that the formal exposure reduction and minimization program must include: (1) exposure reduction and minimization goals, (2) the rationale to support the goals and a strategy for achieving them, (3) the specific actions that the responsible employer plans to take to achieve the goals, and (4) a means of tracking progress towards meeting the goals or demonstrating that the goals have been met. Where levels are below the action level, section 850.25(b)(2) requires responsible employers to include in their CBDPP a description and rationale for the steps they plan to take to reduce and minimize exposures, if such steps are practicable. Such steps are applicable when exposures are measured below the action level to provide additional worker protection. This requirement assures responsible employer's commitment to address and further reduce exposures, as practicable, below the action level and implementing the steps included in their CBDPP.

Section 850.25(c) provides that responsible employers must apply the hierarchy of industrial hygiene controls, as already required under DOE Order 440.1A, to achieve exposure control. This hierarchy dictates that responsible employers first must implement feasible engineering controls, followed by administrative controls, in their efforts to reduce and minimize exposures. Responsible employers can supplement these controls with personal protective clothing and equipment to reduce exposures where engineering and administrative controls are not feasible.

In summary, section 850.25 establishes a graded approach to reducing and minimizing beryllium exposures to levels as low as

practicable. This approach is familiar to the DOE community because it is similar to DOE's "as low as reasonably achievable" approach to radiation protection. DOE's requirement that the responsible employer establish a formal program of setting and tracking reduction goals for exposures above the action level will result in greater management attention to potential high exposures. The requirement that the responsible employer take steps to reduce and minimize exposures that are below the action level commits DOE to continue reducing and minimizing exposures, but without the same level of management attention since these exposures are believed to represent a lower risk to workers.

Six persons commented on the exposure reduction and minimization requirements of the proposed rule. Two of the commenters (Exs. 18, 23) recommended that the rule require responsible employers to initiate reduction and minimization actions to maintain exposures below the action level, rather than below the exposure limit. DOE would essentially be setting a new DOE exposure limit if it followed this recommendation. As previously explained, DOE believes that setting a new exposure limit would be inappropriate because the scientific data is not fully developed and does not yet provide an adequate basis for determining an appropriate new limit. The discussion of section 850.22, Permissible Exposure Limit, provides greater detail on the issue of lowering the exposure limit.

Three of the commenters (Exs. 4, 18, 33) made recommendations that relate to the appropriate trigger for requiring responsible employers to initiate reduction and minimization actions where exposure levels are below the action level. Two commenters (Exs. 18, 33) recommended that the rule require responsible employers to initiate reduction and minimization actions wherever beryllium is detected. One commenter (Ex. 4) interpreted Table 5 in the NOPR preamble to mean that DOE would expect the responsible employer to undertake actions anywhere exposure levels are greater than zero. DOE believes that using either the limit of detection or greater than zero as the trigger is not practicable because trace levels of beryllium are ubiquitous, and beryllium levels in air can be measured everywhere if a large enough air sample is taken to accumulate sufficient beryllium to exceed the lower detection limit of the analytic method being used. DOE believes that final section 850.25(b)(2) best meets DOE's intention of establishing an effective performance-based rule by requiring responsible employer actions, if practicable, where exposure levels are below the action level.

Another commenter (Ex. 3) questioned the efficacy of enforcing a rule that allows each site to establish individual exposure reduction and minimization goals. DOE believes that this approach is adequately enforceable based on its positive experience using contractual mechanisms to enforce similar requirements in radiation protection regulations.

Section 850.26—Regulated Areas

Section 850.26 establishes the regulated area provisions of the CBDPP. Regulated areas are an effective means of minimizing the number of workers exposed to airborne concentrations of beryllium because they prevent or minimize the spread of beryllium to clean areas. This is consistent with good industrial hygiene practice whenever exposure to a toxic substance can cause serious health effects.

The final rule's requirements for regulated areas are essentially the same as those proposed, with certain good hygiene practices being added in response to a commenter's (Ex. 1) concern discussed below under section 850.26(d).

Section 850.26(a) requires the responsible employer to establish regulated areas where, based on breathing zone samples, the employer determines that workers are exposed to airborne concentrations of beryllium at or above the action level.

Three commenters addressed this provision, as proposed, and suggested either alternate or supplemental criteria to trigger the establishment of regulated areas. One commenter (Ex. 18) suggested that the trigger level be lowered to require that regulated areas be established wherever beryllium is detected. DOE believes that the final rule's significantly lower action level provides a suitable mandatory trigger for the establishment of regulated areas. In addition, DOE believes that the CBDPP exposure reduction and minimization provisions will result in the use of an even lower site-specific action level as improved controls become feasible throughout the DOE complex.

The two other commenters (Ex. 3, 34) suggested that the proposed provision for regulated areas be supplemented with a surface contamination level limit that would trigger the establishment of regulated areas. No reliable correlation has been established between surface contamination level and airborne concentrations of beryllium. DOE, therefore, believes that using a surface contamination level limit as a trigger for the establishment of regulated areas would produce minimal benefits to worker health and has not adopted this recommendation.

One of the commenters (Ex. 3) suggested that if engineering or process controls bring exposure levels to below the action level in a regulated area, the area should remain a regulated area to ensure that controls remain in place. DOE does not agree with this comment. While the rule would not prevent responsible employers from implementing such a practice, requiring that regulated area provisions remain in effect after exposures have been reduced to acceptable levels would impose additional financial burdens on employers with no corresponding improvement in worker protection. In addition, DOE believes that such a mandatory provision could undermine the incentives this rule creates for employers to implement effective engineering or process controls. If employers were required to maintain regulated areas regardless of whether they had implemented effective engineering controls, employers might have less motivation to implement the controls. This commenter's concern is at least partly addressed by section 850.24(d), which requires the performance of additional exposure monitoring if operations or procedures change or if the employer suspects a change that could affect exposure levels.

Section 850.26(b) of the rule requires responsible employers to demarcate areas where worker exposures are at or above the action level in a manner that alerts workers to the boundaries of such areas. Under section 850.38 of this part, warning signs must be posted, stating that only authorized personnel are allowed in the area. Due to the serious nature of the adverse health effects associated with exposure to beryllium, no one should be in a regulated area without proper personal protection.

Section 850.26(c) requires responsible employers to limit access to regulated areas to authorized persons only. DOE intends that only individuals who are essential to the performance of work in the regulated area will be authorized to enter regulated areas. Responsible employers will have to evaluate the affected operation and determine which personnel (including managers, supervisors, and workers) are necessary for the performance of the work and thus are authorized to enter. Methods for preventing unauthorized persons from entering a regulated area may include posting a sign indicating that only authorized persons may enter, the use of locked access doors, and other

security measures as required by worksite conditions. DOE believes that employers are best equipped to determine whether any access control methods are needed in addition to warning signs specified in section 850.38.

Two commenters (Exs. 1, 31) suggested the incorporation of additional personal hygiene controls, specifically recommending that the rule prohibit smoking, eating, and drinking in regulated areas. DOE agrees with these commenters and has included in section 850.27 a prohibition on smoking, eating, and drinking in areas where beryllium is above the action level (i.e., in regulated areas).

Section 850.26(d) requires responsible employers to keep a record of all persons who enter regulated areas. The record must include the name of the person who entered, the date of entry, the time in and time out, and the type of work performed. One commenter (Ex. 26) stated that a log of worker activities is not needed unless DOE is conducting a "prospective risk assessment." This commenter believed that a simple log, only documenting who entered regulated areas, would be sufficient. The intended function of these records is clarified in section 850.39, Recordkeeping and Use of Information. DOE believes that recordkeeping must be adequate to permit DOE to monitor the effectiveness of each responsible employer's compliance activities and to provide information regarding each worker's history of potential exposures. This information will assist the responsible employer's occupational medicine staff in establishing appropriate medical surveillance protocols and will aid in DOE's efforts to establish links between working conditions and potential health outcomes. DOE has retained the proposed regulated area recordkeeping requirements in section 850.26(d) of the final rule.

Section 850.27—Hygiene Facilities and Practices

Section 850.27 of the final rule retains the NOPR requirements for responsible employers to provide change rooms or areas and hand washing and shower facilities for beryllium workers. In addition to these provisions, the final rule also requires responsible employers to provide lunchroom facilities that are readily accessible to beryllium workers, ensure that tables for eating are free of beryllium, that no worker is exposed at any time at or above the action level, and specifies that all of these facilities must comply with the requirements of 29 CFR 1910.141. These hygiene provisions are common in OSHA's expanded health standards designed to protect workers from exposures to hazardous particulates.

Sections 850.27(a)(1) and (2) requires responsible employers to assure that workers observe prohibitions on the availability and use of cosmetics, tobacco and chewing products, and food and beverages in areas where beryllium is above the action level. Section 850.27(a)(3) requires responsible employers to prevent beryllium workers from exiting areas that contain beryllium with contamination on their bodies or their personal clothing. DOE believes that these provisions promote sound work place hygiene practices that may protect workers from exposure to other substances present in the workplace, as well as beryllium. These provisions are commonly included in OSHA's substance-specific health standards.

Section 850.27(b) requires responsible employers to provide clean change rooms or areas for workers who work in regulated areas. In addition, section 850.27(b)(1) requires that separate facilities be provided for workers to change into and store personal clothing and clean protective clothing and equipment. DOE believes that such provisions are necessary to prevent cross-contamination between work and personal clothing and the subsequent spread of beryllium into clean areas of the facility and into workers' private automobiles and homes. These provisions also address the need to prevent contamination of clean protective clothing and equipment, ensuring that protective clothing and equipment actually protect workers rather than contribute to their exposures.

Section 850.27(b)(2) requires that the change-rooms used to remove beryllium-contaminated clothing and protective equipment be maintained under negative pressure, or be located in a manner or area that prevents dispersion of beryllium contamination into clean areas.

DOE received two comments on the hygiene facilities and practices provisions of the NOPR. A commenter (Ex. 25) suggested that the requirement to provide change rooms, hand washing facilities, and showers be based on a hazard assessment. DOE believes that requiring responsible employers to perform a separate hazard assessment to determine the need for change rooms and showers is unnecessary and overly burdensome to responsible employers. The requirement for change rooms and showers is triggered by the requirement to establish regulated areas. Regulated areas, in turn, are required wherever a hazard assessment identifies the potential for worker exposures at or above the action level. Thus, the requirement for change rooms and showers is already indirectly triggered by the results of a hazard assessment.

A commenter (Ex. 23) expressed concern that the impact and burden of constructing new change rooms for D&D closure sites has not been considered in the development of the change room provisions, and argued that alternative methods of compliance should be considered for D&D operations. In fact, DOE has addressed the economic impact of requiring responsible employers to provide change rooms for workers in the economic analysis prepared for the NOPR and made available for public review. Based on that economic analysis, DOE is aware that the cost of change rooms may be substantial for some DOE facilities. However, DOE believes that providing change rooms and showers for workers who work in regulated areas is the most effective method for preventing workers from carrying beryllium contamination on their work clothes and bodies from regulated areas to other areas of DOE facilities and to workers' private automobiles and homes. DOE is unaware of any equally effective alternative method for achieving this objective and, thus, has retained the change room and shower provisions in the final rule. The economic burden may be lessened by steps employers already have taken to comply with existing hygiene facility requirements. For example, 29 CFR 1910.120(n)(7) of OSHA's Hazardous Waste Operations and Emergency Response standard already requires employers to provide showers and change rooms for workers on D&D operations of six months duration or longer. DOE contractors at DOE sites are subject to this requirement through their contracts, which require compliance with DOE Order 440.1A or other analogous Orders or standards.

Consistent with the goal of preventing the spread of contamination into adjacent work areas and into affected workers' homes, section 850.27(c)(1) requires responsible employers to provide shower and hand-washing facilities for workers assigned to regulated areas. In addition to controlling the spread of contamination, showering also reduces the worker's period of exposure to beryllium by removing any beryllium that may have accumulated on the skin and hair. Requiring workers to change out of work clothes, which are segregated from their street clothes, and to shower before leaving the plant, leaving work clothing

at the workplace, significantly reduces the movement of beryllium from the workplace. These steps ensure that the duration of beryllium exposure does not extend beyond the work shift and, thus, protect workers and their families from off-site exposures. DOE recognizes that the installation of such facilities may take time in some cases. Accordingly, section 850.13(b) of the final rule allows responsible employers two years to achieve full compliance with the requirements of the rule.

Section 850.27(d) requires responsible employers to provide beryllium workers working in regulated areas with readily accessible lunchroom facilities in which tables for eating are free of beryllium and no worker is exposed at any time to a concentration of beryllium at or above the action level. DOE believes that it is imperative that workers have a clean place to eat to reduce the likelihood of additional exposure to loose beryllium dust through inhalation or ingestion.

Responsible employers must also assure that workers in regulated areas do not enter the lunchroom wearing protective clothing unless the clothing is properly cleaned beforehand. Responsible employers are given discretion to choose any method for removing surface beryllium from the clothing that does not disperse the dust into the air. These requirements are similar to the hygiene facilities and practices provisions in a number of OSHA's health standards.

Section 850.28–Respiratory Protection

Section 850.28 establishes the respiratory protection requirements for the CBDPP. Section 850.28(a) requires that responsible employers comply with OSHA's Respiratory Protection standard (29 CFR 1910.134). Section 850.28(b) requires that responsible employers provide appropriate respiratory protective equipment for all workers exposed, or potentially exposed based upon task analyses, to airborne concentrations of beryllium at or above the action level. This section also requires the responsible employer to ensure that workers use respirators. Section 850.28(c) requires the responsible employer to include in the respiratory protection program any beryllium-associated worker who requests to use a respirator, regardless of exposure level. Section 850.28(d) requires that responsible employers select and use only National Institute for Occupational Safety and Health (NIOSH)-approved respiratory protective equipment or, if none exist for a DOE beryllium activity, DOE-accepted respiratory protective equipment.

Some of the requirements of section 850.28 are not new. For instance, DOE contractors have historically been required to comply with OSHA standards, including 29 CFR 1910.134, through contract provisions requiring compliance with DOE Order 440.1A and its predecessor orders. DOE also has followed OSHA standards in implementing the Federal Employee Occupational Safety and Health Program. DOE Order 440.1A requires employers to provide, and DOE workers to use, appropriate respiratory protective equipment necessary to protect workers from exposures to hazardous substances. In addition, the provisions of 29 CFR 1910.134 include a requirement that employers select only NIOSH-approved respirators. DOE Order 440.1A expands this requirement to allow for the use of DOE-accepted respiratory protection if NIOSH-approved respiratory protection does not exist for a specific DOE task. The provisions of section 850.28 that are new in this final rule are the requirements for the use of respiratory protection: (1) at the action level (rather than at OSHA's PEL); (2) based on the analyses of job activities (rather than only on measured levels); and (3) when requested by beryllium-associated workers regardless of exposure level. DOE does not expect that these new provisions will greatly increase the number of workers who wear respirators at DOE sites. Under current practice, DOE sites require use of respirators at their established action level (ranging from 0.2 to 1.0 $\mu g/m^3$) rather than at the PEL (see CBDPP Economic Analysis, Chapter 3, Section 3.2.8).

The NOPR (Section V, Request for Information) requested comments on changing the trigger for requiring respiratory protection from the PEL to the action level. Seven of the thirteen commenters on respiratory protection (Exs. 16, 18, 23, 25, 26, 28, 30) recommended that the rule be more protective of workers' health by requiring the use of respiratory protection at the proposed action level. None of the remaining four commenters on this issue (Exs. 3, 4, 20, 31) recommended retaining the PEL as a trigger. The seven supporters of using the action level as a trigger represent a wide variety of stakeholders. These commenters' predominant reason for recommending the more protective level as the trigger is the uncertainty about the protection afforded by the current PEL. These commenters provided the following additional reasons for lowering the respiratory protection trigger from the PEL to the action level: (1) To provide a greater margin of safety because of the imperfections in measuring exposure levels; (2) to provide a greater margin of safety because of the imperfections in understanding how to set exposure limits for materials, such as beryllium, for which the cause of illness is the body's immune system reaction; and (3) to establish an internally consistent CBDPP which includes consistent triggers for its protective provisions and, therefore, is rational and easy to communicate. DOE generally agrees with these comments and has revised section 850.28 to require the use of respirators when exposures are at or above the action level.

One commenter (Ex. 3) was concerned that using the action level as a trigger for respiratory protection would render the action level a de facto PEL, because OSHA uses the PEL as the trigger for respiratory protection in OSHA substance-specific standards. Similarly, two commenters (Exs. 4, 20) believed that using the action level as a trigger for respiratory protection signifies that DOE believes that the PEL is not adequately protective. Section I.C., Health Effects, of the Supplementary Information section provides a detailed explanation of the difficulties of determining a safe threshold level for occupational exposure to beryllium, given the current state of knowledge of occupational exposures and the etiology of beryllium disease. DOE's strategy is to require a rigorous program to prevent chronic beryllium disease by reducing and minimizing exposures, while studies continue that may provide the data needed to establish a safe level of exposure to airborne beryllium. The preamble discussions of sections 850.22 and 850.23 explain in greater detail DOE's rationale for continuing to defer to OSHA's PEL, while establishing a more protective action level for DOE.

One commenter (Ex. 26) recommended that the responsible employer provide respiratory protection when warranted based upon an analysis of the worker's job activities. DOE recognizes that many tasks involving beryllium may result in high concentrations of airborne beryllium due to a procedure error, a work error, or an equipment failure. An analysis of the worker's job activities will determine whether respiratory protection is necessary for such tasks. Therefore, DOE added section 850.28(b)(2) requiring responsible employers to provide respiratory protection for task involving such circumstances.

Two commenters (Exs. 26, 30) recommended that the responsible employer provide respiratory protection when it is not otherwise required if requested by a worker due to the uncertainty about what is a safe level and uncertainties in monitoring and controlling a substance like airborne beryllium. DOE agrees with these commenters and has added section 850.28(c), which requires the responsible employer to provide respiratory protection upon the request of the beryllium-associated worker regardless of measured exposure levels.

One commenter (Ex. 3) recommended requiring respiratory protection for exposures at or above the STEL. DOE agrees with the commenter that the STEL would have been an appropriate trigger for respiratory protection if the action level had remained at 0.5 $\mu g/m^3$. However, a STEL of 10 $\mu g/m^3$ for 15 minutes, as proposed in the NOPR, would provide no added protection for workers as a trigger for respiratory protection in the final rule because its action level of 0.2 $\mu g/m^3$ will be exceeded in less than 15 minutes where exposure levels are at 10 $\mu g/m^3$. As explained in the discussion of section 850.22, DOE has decided that it would not be appropriate, given the current science, to establish a lower STEL in this rule.

DOE has clarified its expectations on the use of DOE-accepted respirators in response to one commenter (Ex. 31) who questioned the use of DOE-accepted respirators rather than NIOSH-approved respirators. This requirement as proposed in section 850.28(c) could have been interpreted, as it was by this commenter, to mean that responsible employers could choose between NIOSH-approved respirators and DOE-accepted respirators. This was not DOE's intent. DOE's revision in section 850.28(d)(2) clarifies that responsible employers may use the DOE-accepted respirators only if NIOSH-approved respirators do not exist for particular DOE tasks. This section also references DOE's Respirator Acceptance Program to clarify that DOE only accepts for use respirators that DOE deems acceptable based upon the results of a formal testing and evaluation program.

One commenter (Ex. 31) recommended that the rule specify that all respiratory protective equipment be furnished at no cost to the worker. Section 850.28(a) requires that responsible employers comply with 29 CFR 1910.134, Respiratory Protection, which currently requires in section 1910.134(c)(4), that employers provide respirators at no cost to the employee. Accordingly, DOE will continue to rely upon OSHA's requirements in lieu of making specific changes to the rule.

Section 850.29–Protective Clothing and Equipment

Section 850.29 establishes the protective clothing and equipment provisions (other than respirator use) of the CBDPP. The objectives of this section are to provide clothing and equipment that protects workers against the hazards of skin and eye contact with dispersible forms of beryllium and to prevent the spread of contamination outside work areas that could occur from the improper handling of beryllium-contaminated clothing and equipment.

DOE has clarified the proposed requirement for the responsible employer to provide protective clothing and equipment where skin or eye contact with beryllium is possible. Section 850.29(a) requires that responsible employers provide protective clothing and equipment to beryllium workers where dispersible forms of beryllium may contact workers' skin, enter openings in workers' skin, or contact workers' eyes.

The openings in workers' skin could include fissures, cuts, and abrasions. DOE recognizes that the potential for the development of contact dermatitis, chronic ulcerations, and conjunctivitis is mainly associated with contact with soluble forms of beryllium compounds that are not included in the definition of "beryllium" in this rule. Insoluble beryllium, however, has also been shown to cause chronic ulcerations if introduced into or below the skin via cuts or abrasions (ref. 34). DOE believes that it is prudent industrial hygiene practice to avoid skin or eye contact with a material that causes chronic ulcerations and, therefore, has included protecting workers' skin and eyes from contact with insoluble beryllium in section 850.29(a). The protective equipment required by this section could include coveralls, overalls, jackets, footwear, headwear, face shields, goggles, gloves, and gauntlets, depending on the nature of the operation and the related skin and eye exposure hazards involved.

In the NOPR, DOE requested information regarding the presence of soluble beryllium compounds within the DOE complex and the appropriateness of the exclusion of such compounds from the definition of "beryllium" in the proposed rule. In addition, DOE requested comments regarding the need for the protective clothing and equipment provisions of proposed section 850.29(a)(2), given a DOE survey that had found that soluble beryllium compounds apparently were not present within the DOE complex. One commenter (Ex. 4) recommended excluding soluble beryllium from section 850.29 based on that survey result. However, as a result of other public comments, DOE learned that that survey result was incorrect because one DOE commenter (Ex. 16) indicated that its facilities contain soluble beryllium. Moreover, other commenters (Exs. 26, 30) pointed out that DOE facilities may contain soluble beryllium in the future.

Nevertheless, DOE has not changed the definition of "beryllium" in the final rule to include soluble forms of beryllium, because the principal focus of this rule is on preventing CBD, which is caused by exposure to insoluble forms of beryllium. One commenter (Ex. 26) correctly pointed out that the skin and eye effects that this section is intended to prevent are different health effects than CBD. Although another commenter (Ex. 25) questioned DOE's view that soluble beryllium exposure to the lungs does not cause CBD, DOE finds no evidence in the information on health effects presented in section I.C. that exposure of the lungs to soluble forms of beryllium causes CBD. DOE expects responsible employers to address soluble beryllium hazards in existing worker protection programs under DOE Order 440.1 or analogous Orders or standards cited in responsible employers' contracts with DOE.

Section 850.29(a)(1) requires responsible employers to provide protective clothing and equipment to beryllium workers, at no cost, where airborne beryllium levels are measured or presumed to be at or above the action level, because elevated airborne levels are likely to generate elevated surface levels which represent a skin and eye hazard. DOE has included "presumed to be" in section 850.29(a)(1) in response to a recommendation that one commenter (Ex. 26) made with respect to respiratory protection that applies equally to protective clothing and equipment. The commenter recommended that the responsible employer provide respiratory protection when warranted based upon task analyses. DOE recognizes that many tasks involve beryllium that could readily become airborne in high concentrations due to a procedure error, a worker error, or an equipment failure, but which will have no measurable exposure level unless one or more of these problems occur. DOE believes that an analysis of the worker's job activities would show the need for protective clothing and equipment, and respiratory protection to perform such activities.

Another commenter (Ex. 3) recommended that DOE add a surface contamination level that would also trigger the requirement to provide protective clothing and equipment. DOE agrees with this commenter because elevated surface levels represent a skin and eye hazard, and, accordingly, DOE has added paragraphs (a)(2) and (a)(3) to this section. Section 850.29(a)(2) requires responsible employers to provide protective clothing and equipment to beryllium workers where surface contamination levels are measured to be, or prior to initiating work are presumed to be, above the housekeeping level prescribed in section 850.30. Section 850.29(a)(3) requires responsible employers to provide protective clothing and equipment to beryllium workers where surface contamination level results obtained to confirm housekeeping efforts are above the prescribed housekeeping level.

Section 850.29(a)(2) addresses the situation in which the responsible employer is planning to conduct a task involving beryllium and has time to measure or estimate surface levels before the task begins. Section 850.29(a)(3) addresses the situation in which the responsible employer learns from routine surface monitoring conducted at the end of a shift that housekeeping efforts did not reduce surface levels to below the surface contamination level specified in section 850.30. DOE recognizes that sampling to confirm the adequacy of housekeeping efforts at the end of shifts, and the turnaround time of as much as 24 hours for sample analysis, could result in workers not using protective clothing and equipment for more than a day where surface contamination levels exceed the prescribed surface contamination level. However, DOE believes that these situations will be rare, because routine post-shift cleaning should keep these surface contamination levels from becoming excessive. Also, DOE believes that responsible employers will be motivated to reduce turnaround times for analyses in their efforts to reduce and minimize exposures. DOE selected the term "results" in section 850.29(a)(3) to avoid creating a situation in which the responsible employer would violate the rule simply because the employer did not know that the housekeeping criterion had been exceeded until surface monitoring results were available.

Section 850.29(a)(4) requires the responsible employer to provide protective clothing and equipment upon the request of the beryllium-associated worker, regardless of measured exposure levels.

Section 850.29(b) incorporates into this rule 29 CFR 1910.132, Personal Protective Equipment General Requirements. This OSHA standard is responsive to a commenter's (Ex. 31) recommendation that the rule should require the responsible employer to furnish the clothing and equipment at no cost to the employee, and covers other well-established practices, such as the topics to be included in protective clothing and equipment training, and ensuring that protective clothing and equipment fits properly. This requirement to comply with 29 CFR 1910.132 is consistent with the general worker protection provisions of DOE Order 440.1A, and analogous Orders or standards cited in the responsible employer's contract with DOE.

Section 850.29(c)(1) requires the responsible employer to establish procedures for donning, doffing, handling, and storing protective clothing and equipment that prevent beryllium workers from exiting areas that contain beryllium with contamination on their bodies or their personal clothing. DOE added this provision because one commenter (Ex. 3) correctly pointed out that it was omitted in the proposed rule and is needed to ensure that workers do not track contamination out of areas that contain beryllium. The same commenter recommended that DOE explicitly require HEPA vacuuming of contaminated protective clothing and equipment as part of the required doffing procedure. This final rule does not include a requirement to include HEPA vacuuming in doffing procedure, because DOE believes that this would not allow the employer sufficient flexibility in selecting cleaning procedures.

Section 850.29(c)(2) requires that the procedures for donning, doffing, handling, and storing protective clothing and equipment include a requirement that beryllium workers exchange their personal clothing for full-body protective clothing and footwear (work shoes or booties) before beginning work in regulated areas. This change from personal clothes into protective work clothing must occur in a change room that protects the worker's personal clothes and clean protective clothing from beryllium contamination. DOE believes that the use of full-body protective clothing in lieu of personal clothes in regulated areas is necessary to prevent the spread of beryllium contamination into adjacent work areas and to preclude the possible transport of beryllium onto affected workers' private property. A recent study (ref. 35) has documented the transport from work areas of beryllium on workers' hands and inside their personal vehicles.

One of DOE's objectives is to prevent the spread of beryllium contamination, thereby reducing the number of persons exposed and the opportunities for potential exposures. Thus, sections 850.29(d) through (f) establish provisions to control the handling, maintenance, cleaning, and disposal of beryllium-contaminated protective clothing and equipment.

Section 850.29(d) requires the responsible employer to ensure that workers do not remove beryllium-contaminated protective clothing and equipment from areas that contain beryllium, except for authorized activities such as cleaning and repairing the clothing and equipment. DOE replaced "site" in the proposed rule with "area that contains beryllium" in the final rule to clarify its intent to minimize contamination of other areas at the site as well as outside the site.

Section 850.29(e) requires the responsible employer to prohibit the removal of beryllium from protective clothing and equipment by blowing, shaking, or other means that may disperse beryllium into the air. Although DOE generally believes that responsible employers should have the flexibility to determine the most appropriate means to clean contaminated clothes based on their own specific worksite conditions, DOE has included this well recognized and accepted industrial hygiene control to prevent the dispersion of beryllium particles into the workplace atmosphere.

Section 850.29(f), which was proposed as section 850.29(c), requires responsible employers to clean, launder, repair, and replace protective clothing and equipment as needed to ensure its continued effectiveness in protecting workers. This section allows contractors flexibility in determining the required frequency for laundering protective clothing based on specific work conditions and the potential for contamination.

Section 850.29(f)(1), which was proposed as section 850.29(b), paragraphs (1)–(2), requires the responsible employer to ensure that protective clothing and equipment removed for laundering, cleaning, maintenance, or disposal, is placed in containers that prevent the dispersion of beryllium dust, and that these containers are labeled in accordance with section 850.38. These warning labels will help ensure appropriate subsequent handling of beryllium-

contaminated materials and may prevent inadvertent exposures that could result if laundry, maintenance, or disposal personnel are not aware of the beryllium contamination and the precautions prescribed by the responsible employer to prevent the release of airborne beryllium. In section 850.29(f)(1) of the final rule, DOE has deleted the words "impermeable" and "are designed" which were in proposed section 850.29(b)(1) in response to a commenter's (Ex. 8) recommendation to clarify DOE's intent. This change eliminates the possible implication that DOE expects responsible employers to provide special containers even if existing containers are capable of preventing the spread of contamination.

Section 850.29(f)(2), which was proposed as section 850.29(d), requires the responsible employer to ensure that organizations that launder or clean DOE beryllium-contaminated protective clothing or equipment are informed that exposure to beryllium is potentially harmful, and that clothing and equipment should be laundered or cleaned in the manner prescribed by the responsible employer to prevent the release of airborne beryllium. DOE replaced "any individual" with "organizations" to clarify that DOE's objective for this section is to ensure that any organization that launders beryllium contaminated clothing is informed of the hazards of handling beryllium contaminated items so that the organization can take steps to protect its workers. The proposed wording "any individual" could have been interpreted as establishing a direct relationship between the responsible employer that generated the contaminated clothing and the employee of the laundry or cleaning organization, which is not DOE's intent. Also, DOE clarifies in section 850.29(f)(2) that this section requires informing both on-site cleaning and laundry services, as well as off-site cleaning and laundry vendors. On-site cleaning and laundry services are covered by this rule, but may not know about the presence and hazards of beryllium on the clothing and equipment unless the responsible employer informs them.

DOE has deleted the words "at or above the action level or above the STEL," which in proposed section 850.29(a) qualified the requirement to inform downstream launderers or cleaners of beryllium-contaminated protective clothing and equipment. This change is consistent with final section 850.25, which requires reduction and minimization, if practicable, where exposure levels are below the action level.

One commenter (Ex. 31) recommended including in the rule provisions for preventing heat stress. DOE recognizes that requiring protective clothing and equipment for dispersible forms of beryllium compounds at the final rule's lower action level is likely to result in greater use of protective clothing and equipment, including respirators, and consequently greater potential for heat stress. DOE believes that the health benefit from lowering the risk of CBD outweighs any increased health risk caused by heat stress that results from the requirements of this section. DOE has not included heat stress provisions in this rule because it is a potential problem for many DOE activities that require the use of protective clothing and equipment; and DOE expects heat stress issues to be addressed in the responsible employer's existing worker protection program.

Section 850.30—Housekeeping

Section 850.30 establishes the housekeeping provisions of the CBDPP. Good housekeeping practices are necessary in operational areas where beryllium is used or handled, to prevent the accumulation of beryllium contamination on surfaces throughout the workplace. Such accumulations, if not controlled, may lead to the spread of beryllium contamination on surfaces and the re-suspension of beryllium particles into the air, both in the area where beryllium dusts were originally generated and in other work areas. In addition, the uncontrolled accumulation of beryllium-contamination on equipment in the workplace increases the potential for worker exposure to beryllium during the performance of equipment maintenance, handling, and disposal tasks.

DOE in section 850.30(a) has established that the removable contamination housekeeping level on surfaces must not exceed 3 μ/100 cm^2 during non-operational periods. Establishing a surface removable contamination limit reduces the potential for spread of beryllium contamination. Responsible employers must perform measurements to determine if the operational work area is in compliance with the rule. In addition, monitoring surface contamination levels is an indispensable tool for ensuring that beryllium emissions from operations are under control. The only practical method of monitoring surface levels is to maintain the surface contamination at an established housekeeping level so that elevations above that level can readily be detected.

The performance of housekeeping tasks can, in and of itself, lead to worker exposures to beryllium-contaminated dust. Therefore, the housekeeping section also seeks to prevent the spread and re-suspension of dust during housekeeping activities.

Two commenters (Exs. 26, 28) questioned the scientific basis for establishing a 3 μg/100 cm^2 surface removable contamination level. In addition, these two commenters stated that the variability associated with wipe sampling makes surface sampling method an unreliable method for sampling. DOE views wipe sampling as a useful and accepted method for providing qualitative information on chemical contamination of work surfaces, and agrees with the following statement in the OSHA Technical Manual (Section II: Chapter 2, Sampling for Surface Contamination): "Wipe sampling is an important tool of work site analysis for both identifying hazardous conditions, and in evaluating the effectiveness of * * * housekeeping, and decontamination programs." Accordingly, this requirement is intended only as a housekeeping performance measure, and should not be viewed as a mechanism for measuring, or predicting airborne concentrations of beryllium. In addition, this requirement only applies to removable or loose surface contamination, which could become re-suspended in the workplace air or spread to non-controlled areas.

DOE does not intend the requirement for surface wipe sampling in this rule to preclude the use of other surface sampling methods for measuring beryllium contamination. DOE agrees with comments calling for more research (Exs. 16, 28) and encourages the use, research, and development of new technologies such as direct reading instruments, which may provide better results than wipe sampling.

Section 850.30(a) requires that responsible employers conduct routine surface sampling in operational areas, to ensure the effectiveness of their housekeeping efforts. This sampling would not include the interior of installed closed systems such as enclosures, glove boxes, chambers, or ventilation systems. Sampling should not be carried out during a normal work shift, but rather it should be undertaken after normal clean-up and during non-operational periods.

Affected sites throughout DOE have already established, under the interim CBDPP, allowable beryllium surface contamination levels to ensure the

effectiveness of their housekeeping procedures. These levels range from 1 to greater than 5 μg/100 cm², with the majority of the sites using approximately 3 μg/100 cm² or less as the criterion for determining the cleanliness of their working environment outside of regulated areas. Comments on the NOPR called for setting levels ranging from less than 1 μg/100 cm² (Exs. 14, 18) to 5 μg/100 cm² (Ex. 24). Information collected from the sites during the development of the interim beryllium CBDPP indicated that the Pantex and Y–12 facilities currently have an allowable surface concentration level of 25 μg/100 cm² for regulated areas. Los Alamos National Laboratory (LANL) procedures call for re-evaluation of the operations with additional cleaning of beryllium operations areas at levels greater than 26 μg/ft² (2.8 μg /100 cm²). Lawrence Livermore National Laboratory (LLNL) indicated those areas with surface concentrations greater than 3 μg/100 cm² are designated as regulated areas. Rocky Mountain Remediation Services (a sub-contractor at Rocky Flats) indicated that a surface contamination level greater than 25 μg/ft (2.7 μg/100 cm²) outside of regulated areas triggers clean up actions at its site. The AWE facility at Cardiff (United Kingdom) has utilized a surface action level of 10 μg/ft² (1 μg/100 cm²) outside of regulated areas since 1990. Based on this range of data, DOE adopted the 3 μg/100 cm² housekeeping level in the proposed rule and continues to believe it is a reasonable surface removable contamination level that should not be exceeded.

One commenter (Ex. 3) recommended that the surface removable contamination level be the same level as the criterion for releasing contaminated equipment for other uses. Another commenter (Ex. 23) objected to establishing a single surface limit for removable beryllium contamination that would be both a housekeeping and release level, recommending instead a tiered approach, with different levels for normal or safe work conditions (and free release of equipment), for beryllium work, and for special work conditions. For the reasons discussed under section 850.31, Release Criteria, DOE has adopted different levels for the release of equipment that depend on the intended future use of the equipment.

One commenter (Ex. 24) expressed concern that certain beryllium oxide weapons components could not meet the 3 μg/100 cm² level, and recommended that weapons components be exempt from surface contamination limits. DOE has revised section 850.30 to clarify that the surface removable contamination level is to be measured post-shift, and that the purpose of the surface level is not to have an absolute value of 3 μg/100 cm² at all times during the machining or working with beryllium or beryllium parts. DOE is aware that it may not be possible to maintain surface levels of beryllium in an operational work area below the 3 μg/100 cm² limit at all times. Again, the surface removable contamination level is intended as a post-shift measure of the effectiveness of routine housekeeping efforts.

DOE emphasizes that the housekeeping concerns addressed by section 850.30 apply to areas where workers may be exposed to beryllium, not to closed-off rooms or buildings. To make this clear, DOE has added the term "operational areas" in section 850.30(a). If routine surface sampling during non-operational or post-shift periods shows that the removable contamination level has been exceeded, clean-up measures must be instituted.

DOE agrees with the comment (Ex. 28) that the meaning of the term "removable" contamination may not be clear. Therefore, DOE has added a new definition of "removable contamination" and deleted the definition of "surface contamination" in section 850.3. The definition of "removable contamination" is taken from the U.S. Department of Energy Radiological Control Manual (DOE/EH–0256T Revision 1, April 1994). Use of this language in this rule maintains a consistent approach with DOE's radiological surface sampling program.

Two commenters suggested the use of wet wipes for surface sampling, while another commenter (Ex. 24) indicated that there is no basis for the application of a wet method. NIOSH, in its recent publication on beryllium contamination inside worker vehicles, supports the use of a wet wipe sampling method to collect beryllium samples in potentially contaminated employee vehicles (ref. 35).

The use of diverse sampling methods (e.g., differences in type of sample media, type of solvent (if any) on the sample media, area sampled, etc.) may easily lead to the reporting of inconsistent results. To reduce the variability in reported surface contamination across the DOE complex, DOE recommends, but does not require, the use of a single sampling method: NIOSH method 9100 (NIOSH Manual of Analytical Methods, 4th Edition, August 15, 1994, Lead in Surface Wipe Samples). This method may have to be modified for surfaces smaller than 100 cm² using a procedure such as that described in Appendix D of 10 CFR part 835. Sites using other methods, e.g., dry wipe sampling, should transition to the NIOSH method in a cost-effective manner. Current data is not clear on the relative efficiency of dry verses wet sampling on the variety of surfaces found in the DOE. Therefore, immediate adoption of the NIOSH method at sites across DOE may be impractical and add no immediate value to worker health and safety. In the long term, by recommending a single method (a wet method) for conducting the surface sampling, DOE believes that the variability associated with surface sampling will be reduced without specifying a particular method in the rule.

One commenter (Ex. 3) suggested that the term "routine" in section 850.30(a) should be more clearly defined, i.e., weekly or monthly. Because DOE believes that this rule should be as performance-based as possible, the frequency of "routine" monitoring procedures under this section should be developed by the local health and safety specialist (industrial hygienist) based on the specific circumstances at the site.

Section 850.30(b) prohibits the use of compressed air or dry methods and requires the use of vacuuming, wet or similar methods for the cleaning of beryllium-contaminated floors and other surfaces. The purpose of using these methods is to reduce or eliminate the potential for re-suspension of beryllium dust into the air and breathing zone of the worker.

One commenter (Ex. 23) requested flexibility in cleaning methods, such as permitting the use of sticky tack cloths. DOE agrees with the comment and in the final rule has allowed the use of other cleaning methods, such as sticky tack cloths, that have the same end result as wet vacuuming (i.e., a reduction of dust-producing cleaning methods). These are appropriate methods for complying with the housekeeping requirement of the rule.

Section 850.30(c) requires the use of HEPA filters in all vacuuming operations used to clean contaminated or potentially contaminated surfaces, and further requires filter replacement as needed, to maintain the capture efficiency of the vacuum system. The use of wet methods for reducing or minimizing the dispersal of dust during general housekeeping tasks, such as sweeping, is a common industrial hygiene practice. HEPA filters must be used to prevent the spread of dust by effectively collecting the dust that is collected by vacuum systems. Responsible employers should have procedures for the cleaning or replacement of filters that ensure

minimum employee exposure to beryllium dust on the filter.

As discussed in earlier sections of this analysis, the movement of contaminated equipment from a regulated area to a nonregulated area may result in the spread of beryllium contamination to the nonregulated area. To prevent the potential spread of contamination from the performance of housekeeping activities required by this rule, section 850.30(d) requires that cleaning equipment used in areas where surfaces are contaminated or potentially contaminated with beryllium be labeled, controlled, and not used for other, non-hazardous materials. These procedures are similar to those required under OSHA's asbestos standard for equipment used during cleanup or removal of asbestos from buildings.

Section 850.31—Release Criteria

Section 850.31 establishes beryllium contamination levels and other requirements that must be met before equipment and other items used in beryllium work areas may be released or transferred to the general public and non-beryllium areas of DOE facilities, or to facilities engaged in work involving beryllium. DOE requested comments on the setting of "beryllium free-release" public contamination levels in the NOPR. After considering the comments received in response to this broad request for views and information, DOE reopened the comment period on June 3, 1999, to invite public comment on specific options for release criteria that were being considered by DOE (64 FR 29811). Section 850.31 reflects DOE's consideration of the substantial number of comments received from organizations and individuals on this topic.

In the notice of reopening of the comment period, DOE suggested that a reasonable contamination level for release of equipment and other items to the public for non-beryllium uses would be 0.1 μg/100cm^2. This level was based on the housekeeping and release levels believed to be in effect at various DOE facilities and the AWE facility in the United Kingdom. DOE also stated that it was inclined to adopt a contamination level of 3 μg/100 cm^2 for release of items for beryllium work in other facilities. This level was based principally on the practice at the Rocky Flats.

Ten organizations and individuals submitted comments that recommended release level values. These values ranged from non-detectable to 3 μg/100 cm^2 for public release and non-detectable to 10 μg/100 cm^2 for release to beryllium facilities.

One commenter (Ex. 47) stated that there should be a single contamination level for both the housekeeping standard for beryllium areas and for release of items for beryllium and non-beryllium uses. Another commenter (Ex. 43) urged DOE to adopt a single criterion for release to the public and DOE non-beryllium facilities and to beryllium-handling facilities because it would be simpler to administer. DOE does not agree with these comments, because the workers in operational areas where beryllium is used have been trained in the hazards of beryllium and the proper use of protective equipment that is required to be worn in those areas. DOE does not believe that the general population or DOE non-beryllium workers should be exposed to the same level of a hazardous material as workers who have been trained in the safe handling of that material. DOE, therefore, has included in the rule separate requirements for the release of beryllium-contaminated equipment and other items to facilities engaged in beryllium work and for releases to the general public or DOE non-beryllium facilities.

Section 850.31(a) requires the responsible employer to clean beryllium-contaminated equipment and other items to a contamination level that is as low as practicable, but not to exceed the removable contamination levels specified in section 850.31(b), for release to the general public or to non-beryllium areas of DOE facilities, and section 850.31(c), for release to facilities performing work with beryllium. In addition, DOE has included in these sections other requirements that are designed to protect workers and others from the hazards associated with exposure to beryllium. DOE uses the words "and other items" after "equipment" in section 850.31(a) to cover tools, supplies, documents, etc., and any personal property in beryllium-handling areas that may not be encompassed by the term "equipment." The phrase "equipment and other items" does not include real property or buildings.

Release to the public and for use in DOE non-beryllium areas. Section 850.31(b)(1) sets the removable contamination level for equipment and other items to be released to the general public or for use in DOE non-beryllium work areas at 0.2 μg/100cm^2 or the concentration level of beryllium in soil at the point of release, whichever is higher. The equipment also must be labeled, in accordance with section 850.38(b), to warn recipients of potential beryllium hazards. The responsible employer must condition the release of equipment and other items to the public based on the recipient's commitment to implement controls to ensure that exposure does not occur. Such a commitment should be based on the nature and possible future uses of the equipment and other items, the nature of the beryllium contamination, and whether exposure to beryllium is foreseeable.

In the notice of reopening, DOE referenced a comment by the AWE (Ex. 1) which reported that the housekeeping surface action level in its Cardiff, Wales facility had been reduced to 1 μg/ft^2 (about 0.1 μg/100 cm^2) in 1990. DOE reasoned that, based on the AWE experience and release limits included in DOE facilities' interim CBDPPs, a public release limit as low as 0.1 μg/100 cm^2 would be achievable. Several commenters (Exs. 41, 43, 46, 47, 51) argued that this level would be difficult and costly to achieve, and that there is no technical basis for concluding that it would be more beneficial than a higher level. AWE (Ex. 38) commented that it is not using 0.1 μg/100 cm^2 as a release level; its current policy is to dispose of contaminated items in a landfill site. The Pantex Plant (Ex. 46) stated that its reported use of 0.1 μg/100 cm^2 as a release criterion was incorrect, possibly due to a typographical error, and it recommended using 3 μg/100 cm^2 for the public release limit. Rocky Flats (Ex. 47) pointed out significant differences between the AWE Cardiff facility, which is a stable work environment, and the Rocky Flats facility, which is engaged in decontamination and decommissioning work. Two commenters (Exs. 43, 46) argued that a surface removable contamination level of 0.1 μg/100 cm^2 could easily be exceeded by background levels of beryllium.

Other commenters (Exs. 44, 45, 48, 49) took the position that any detectable level of beryllium on the surface of an item should be presumed to present a health risk and, therefore, that no item having a detectable level of beryllium should be released to anyone for any purpose. One commenter (Ex. 48) stated that the correlation between surface beryllium levels and associated health hazards is unknown, and the possibility exists for fixed or inaccessible beryllium to be liberated when equipment is worked on or repaired. Another commenter (Ex. 49) stated that DOE should take a cautious stance because of the current lack of information regarding the nature of the exposure-response relationship and the factors that underlie individual sensitization towards beryllium. Two commenters (Exs. 49, 52) recommended life-cycle

administrative controls for beryllium-contaminated equipment.

Section 850.31(b)(3) responds to the recommendation of comments (Exs. 26, 38) calling for a risk assessment that considers the downstream user's exposure potential, the history and type of equipment, and the nature of the contamination, in order to decide whether and how to release equipment and other items for non-beryllium uses. As recognized by DOE in the reopening notice, surface or wipe sampling is not an adequate means of characterizing potential exposure risk. For example, a lathe or other piece of equipment released because it is determined to be beryllium-free on the surface may contain internal beryllium dust that could become airborne and present a health hazard during future maintenance. On the other hand, other types of equipment may contain internal beryllium that is combined with other substances (e.g., grease) which would make it unlikely that the beryllium would ever become airborne. The presence of this type of suspended contamination, even at levels above the surface release criterion, would not necessarily present a health hazard. Accordingly, an assessment of potential risk of exposure should be undertaken before the release of any equipment or other item to either the general public or to DOE for non-beryllium uses. Based upon the assessment, the decision should be made as to ultimate disposition of the equipment and any conditions that should be placed on its future use.

After considering the comments, DOE is persuaded that it would be costly, if not infeasible, to implement a contamination level of 0.1 μg/100 cm^2 or lower as the public release criterion. Section 850.31(a)(1) requires responsible employers to clean equipment and other items to the lowest contamination level practicable and to ensure that removable contamination on surfaces does not exceed 0.2 μg/100 cm^2 or the concentration level of beryllium in local soil. This removable contamination criterion is based, in large measure, on information provided in comments submitted by the contractor that manages the Rocky Flats facility (Ex. 47). To comply with the interim CBDPP established by DOE Notice 440.1, Rocky Flats conducted an extensive site characterization (over 6000 samples) using 0.2 μg/100 cm^2 as the target contamination level. Rocky Flats reported that they found the 0.2 μg/100 cm^2 to be an achievable level and determined (using recently published re-suspension factors) that any airborne beryllium generated from re-suspending beryllium from surfaces, even with some beryllium surface levels above 0.2 μg/100 cm^2, would be expected to be well below the EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) limit of 0.01 $\mu g/m^3$ and therefore, at safe levels. EPA's NESHAP is the national standard for community air that the population continuously breathes.

DOE has addressed the concerns of commenters (Exs. 46, 50) that it may not be possible to clean equipment and other items to below the natural background of beryllium in local soil. It is highly unlikely that this rule would apply to soil because soils generally contains less than 0.1 percent beryllium and, therefore, is not considered beryllium for the purposes of this rule. Nonetheless, DOE included in section 850.31(b)(3) the words "or the concentration level of beryllium in local soil at the point of release" to eliminate the possibility that the rule would compel a responsible employer to clean local soil off of equipment and other items before release.

DOE does not agree with the view of some commenters that, in the absence of scientific evidence of a threshold or "safe" level of exposure to beryllium, the surface contamination release level should be at the limit of detection or zero. Although one commenter (Ex. 45, 45B) submitted information indicating that re-suspension of beryllium in the air is possible on surfaces with less than 1.0 μg/100 cm^2 of beryllium, there currently is no scientific evidence that surfaces cleaned to that level would result in airborne concentrations of beryllium at levels that would be harmful to workers.

DOE has addressed the concern about the potential for exposure to re-suspended beryllium by requiring a case-by-case assessment of risk before equipment and other items are released for non-beryllium uses. There is likely to be wide variation in these situations, and DOE is not prepared at this time to prescribe uniform management controls. However, this is an area for which DOE may develop guidance to assist field elements, as experience is gained under this rule.

One commenter (Ex. 43) recommended establishing a general surface release level of 1 μg/100 cm^2, plus labeling of items. The commenter suggested the use of labels to shift responsibility for controlling future exposures to the recipients of the equipment or items. DOE does not believe that simply cleaning the outside of the equipment and other items and providing warning to the new user is adequate because some recipients, particularly recipients who have not performed work using beryllium, may not fully understand the risks associated with beryllium exposure.

Release for beryllium work. Section 850.31(c)(1) sets the contamination level for equipment or other items released for use in other facilities engaged in beryllium work at 3 μg/100 cm^2. The equipment or item also must be labeled in accordance with section 850.38(b). Section 850.31(c)(3) requires the responsible employer to ensure that a released item is enclosed or placed in sealed, impermeable bags or containers to prevent exposure to beryllium during handling and transportation to its destination. Enclosure of equipment and other items to be released to other beryllium operations can be accomplished by any practical means, such as wrapping in plastic.

Several commenters recommended that DOE establish a higher surface contamination release level for equipment and other items to be transferred to another facility for beryllium work than is allowed for items released to the public or for use in DOE non-beryllium work (Exs. 38, 41, 42, 46, 51). Surface contamination levels recommended by the commenters (see Table 9) for release of equipment and other items to be used in beryllium areas range from 0 and non-detectable to 10 μg/100 cm^2. Rocky Flats (Ex. 47) previously established a release level for equipment and other items to be transferred to other DOE facilities for beryllium work at 2.5 μg/100 cm^2. Several commenters (Exs. 41, 42, 51) and a number of the DOE sites reporting release levels support the use of 3 μg/100 cm^2 or less as a release level for equipment and other items that will be used for beryllium work.

Based upon current surface sampling technology, DOE sees no appreciable difference between 2.5 μg/100 cm^2 and 3 μg/100 cm^2 and, therefore, has adopted the 3 μg 100 cm^2 value for release of equipment and other items to other facilities for beryllium work. Adoption of this value also maintains a consistency with the housekeeping requirements for operational beryllium areas, which will simplify implementation by DOE facilities.

Other issues. One commenter (Ex. 51) recommended that the rule specify that an industrial hygienist should determine the number and location of swipe samples. DOE views the determination of the number and location of swipe samples to be part of the hazard assessment, which must be managed by a qualified individual such as a CIH (see discussion for section 850.21).

Two commenters (Exs. 49, 50) were concerned with dermal exposures to beryllium. DOE agrees that there is a potential health hazard associated with dermal exposure to beryllium, and has imposed requirements under sections 850.29 and 850.37 to protect workers handling beryllium. The hazards associated with dermal exposures also are dealt with in the DOE facilities' health and safety programs under DOE Order 440.1A or, analogous Orders or standards cited in responsible employers' contract with DOE.

Section 850.32—Waste Disposal

Section 850.32 (proposed as section 850.31) establishes the waste disposal provisions of the CBDPP. Like many of the provisions of the rule (e.g., regulated areas, protective clothing and equipment, and housekeeping), the waste disposal provisions are designed to minimize the spread of beryllium contamination throughout the facility or beyond the sites boundaries.

DOE believes that the most effective way to control the spread of contamination resulting from waste disposal activities is to prevent or minimize the generation of beryllium waste. Accordingly, section 850.32(a) of the final rule requires responsible employers to employ waste minimization principles in conducting beryllium activities. Good housekeeping practices, required by section 850.30, aid in this effort by continually removing beryllium dust accumulations from work surfaces, thereby reducing the level of contamination of workplace equipment. The performance of hazard analyses on operations with the potential to generate wastes, as required by section 850.21, can help responsible employers identify potential sources of wastes and evaluate possible controls that could be implemented to prevent or reduce waste generation. Other waste minimization practices, such as minimizing the equipment and material that is exposed to beryllium contamination, will also assist in reducing the amount of material that must be disposed of as beryllium or beryllium-contaminated waste, thus reducing the potential beryllium exposure hazards.

Section 850.32(b) of the final rule requires responsible employers to dispose of beryllium-containing waste, and beryllium-contaminated equipment and other items that are disposed of as waste, in sealed impermeable bags, containers, or enclosures that are labeled in accordance with section 850.38. Enclosure can be any practical mechanism for sealing, such as wrapping in plastic. DOE believes these waste disposal provisions are necessary to prevent the re-suspension of beryllium contamination into the workplace atmosphere. Warning labels are necessary to ensure that workers are aware that bags, containers, or enclosures contain beryllium so that they can take appropriate precautions. Furthermore, responsible employers must comply with applicable Federal, state, and local regulations governing the management, transportation, and disposal of waste that contain beryllium.

DOE received two comments regarding the waste disposal provisions of the NOPR. One commenter (Ex. 31) applauded DOE for including waste minimization principles as a control measure for reducing beryllium exposures. This commenter suggested that DOE consider developing a non-mandatory appendix to the rule or stand-alone guidance to illustrate waste minimization principles and provide ideas for workers and employers. DOE recognizes the utility of non-mandatory guidance in assisting responsible employers in implementing certain mandatory requirements of the CBDPP. DOE notes, however, that the U.S. Environmental Protection Agency and other Federal agencies have already developed a wide variety of guidance materials addressing waste management, waste minimization, and pollution prevention principles and practices. Not only are these guides readily available to the DOE community, but many DOE sites have used these guides to develop their own hazardous waste management plans. For this reason, DOE believes that the development of an additional guidance document to address waste minimization principles for the final CBDPP rule is not necessary. DOE is developing an implementation guide for the CBDPP rule that will provide general guidance for disposal of beryllium waste.

The other commenter (Ex. 18) suggested that the waste disposal provisions should address the declassification of beryllium parts that are classified for national security purposes at certain DOE sites. This section of the final rule requires responsible employers to control the generation of beryllium-containing waste, and beryllium-contaminated equipment and other items that are disposed of as waste and to dispose of this equipment and other items in a safe manner. DOE does not intend for these provisions to alter or affect the classification of beryllium-contaminated equipment and other items, nor to supersede the applicable requirements for protection of such equipment and items. Accordingly, beryllium-contaminated materials that are classified must be handled in accordance with the governing national security regulations, standards, and policies. Responsible employers also must dispose of such materials in accordance with the provisions of this rule.

Section 850.33—Beryllium Emergencies

Section 850.33 (proposed as section 850.32) establishes the beryllium-related emergency provisions of the CBDPP. Such provisions are particularly important in light of the possibility, suggested by several commenters, that a single, high-level beryllium exposure may have been the cause of CBD occurring among several workers thought to have had no exposure or only incidental, low-level exposures to beryllium.

Proposed section 850.32 would have established broad performance-based provisions requiring responsible employers to develop procedures for responding to and alerting workers to beryllium emergencies, to ensure the availability and use of appropriate protective equipment during related cleanup operations, and to provide emergency response workers with appropriate training on proper response procedures.

Two commenters (Exs. 11, 31) responded to the proposed beryllium emergencies section, and both requested that DOE provide additional guidance regarding beryllium emergency procedures, training, and personal protective equipment requirements. One commenter (Ex. 31) suggested that this guidance was needed to ensure a consistent and coordinated response to beryllium emergencies in cases in which workers from different employers respond to the same event. Both commenters suggested that DOE consider incorporating elements of the emergency response provisions of OSHA's Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120) in the CBDPP rule.

DOE agrees with the commenters, and notes that the beryllium emergencies provisions of the NOPR were not intended to supersede the applicable provisions of 29 CFR 1910.120. Accordingly, to avoid confusion and duplicative efforts and to ensure consistent and coordinated responses to beryllium emergencies at DOE facilities, DOE has revised the beryllium emergencies section (renumbered section 850.33 in the final rule) to require responsible employers to comply with 29 CFR 1910.120(l) for

emergency response activities related to hazardous waste cleanup operations, and 29 CFR 1910.120(q) for emergency response activities related to all other operations. Also, DOE will provide general guidance on preparing for, and responding to, emergencies involving beryllium in the DOE implementation guide for this rule.

Section 850.34—Medical Surveillance

Section 850.34 (proposed as section 850.33) establishes the medical surveillance provisions of the CBDPP. These provisions are aimed at: (1) Identifying workers at higher risk of adverse health effects from exposure to beryllium; (2) preventing beryllium-induced disease by linking health outcomes to beryllium tasks; and (3) making possible the early treatment of beryllium-induced disease.

Several changes have been made to the medical surveillance provisions as proposed. These changes include enlarging the scope of the covered population to include former beryllium workers who are still employed at DOE facilities in non-beryllium work; adding the term "beryllium-associated worker," which includes all current workers who have or had the potential for exposure to beryllium; adding a multiple and alternate physician review process; deleting the requirement that exposure be at or above the action level before initiating medical surveillance; and deleting the requirement for Office of Environment, Safety and Health review of the written medical surveillance program. In addition, DOE has made editorial changes to clarify various provisions.

The medical surveillance program is designed to ensure the prompt identification, and makes possible the proper treatment, of workers who become sensitized to beryllium or develop CBD. In addition to determining the incidence of CBD in the workforce, the medical surveillance program fulfills a critical information development function, including identifying the risk factors associated with the development of CBD and beryllium sensitization. This rule requires that medical surveillance be given to workers who are at the greatest risk from continued exposure. This determination should be made on the basis of the air monitoring results, the SOMD's recommendation, and any other relevant information the responsible employer may possess, such as past medical or air monitoring records, workers' job tenure, etc.

DOE realizes that some workers may elect not to participate in the medical surveillance program because they believe that a diagnosis of CBD or beryllium sensitization could have a negative impact on future employment opportunities or on their health insurance. In light of this concern and DOE's desire to maximize worker participation in the medical surveillance program, DOE in the NOPR requested interested parties to comment on the feasibility and utility of including anonymous testing as a provision in the final rule. In requesting public comment, DOE noted two concerns it had regarding the use of anonymous testing; specifically, concern about DOE's inability to correlate collected exposure data to health outcomes for workers choosing anonymous testing, and concern about the effect of anonymous testing on DOE's ability to conduct follow-up tests to confirm positive Be-LPT results.

Eight commenters (Exs. 4, 16, 17, 23, 26, 28, 30, 31) responded to DOE's request for information regarding anonymous testing. Most commenters stated that anonymous testing would not provide significant additional benefits or protection for workers. In addition, all of the commenters shared DOE's concerns regarding the resulting inability to correlate collected exposure data to health outcomes, and the difficulty of tracking employees for follow-up testing to confirm positive results. The commenters believed that these two drawbacks overshadow any potential increase in worker participation.

One commenter (Ex. 17) expressed concern that the use of anonymous testing would limit the employer's ability to provide support to workers receiving medical surveillance. This commenter noted that ongoing support and reassurance is essential for those workers with positive or inconclusive test results. Three commenters (Exs. 16, 23, 26) stated that medical surveillance should be used to determine workplace exposures and evaluate the effectiveness of workplace controls. These commenters believe that anonymous testing would hamper this effort by preventing responsible employers from identifying specific jobs or tasks that lead to beryllium-related health effects.

For reasons stated in the NOPR and expressed by all eight commenters, DOE has decided against the use of anonymous testing. However, DOE has taken steps in the final rule to protect the privacy of beryllium-associated workers, e.g., by requiring the use of unique identifiers (see discussion of section 850.39). DOE cannot responsibly accomplish the tasks of ameliorating the effects of exposure to beryllium and developing needed data on the cause and development of CDB through anonymous testing. DOE also believes that offering anonymous testing as a supplement to identified testing would discourage workers from participating in identified testing. Accordingly, provisions for anonymous testing are not included in the final beryllium rule.

Section 850.34(a)(1) requires responsible employers to establish and implement a medical surveillance program for beryllium-associated workers. DOE adheres to its view that participation in the medical surveillance program should not be mandatory for workers. The responsible employer's obligation is to offer to provide the medical tests and procedures as required. DOE expects that where worker confidence in the medical program exists, refusal to participate will be minimal.

The term "beryllium-associated worker" is used in the final rule where DOE has determined that coverage of provisions should not be limited to current workers regularly employed in DOE beryllium activities. Use of the term "beryllium-associated worker" will increase the population eligible to receive medical surveillance by including current workers with past beryllium exposures or potential for exposures.

Numerous commenters (Exs. 2, 3, 4, 14, 16, 17, 28, 30, 29, 31) made recommendations regarding the level of employee exposure that should trigger worker participation in the medical surveillance program. Two of these commenters (Exs. 3, 4) objected to offering medical surveillance to all workers potentially exposed to beryllium. However, their reasons for not wanting to include all potentially exposed workers differed. One commenter (Ex. 3) stated that placing all potentially exposed employees in the medical surveillance program would be inconsistent with the permissible exposure limit. The other commenter (Ex. 4) was concerned with the costs associated with such a strategy, and the potential for causing worker anxiety from false-positive Be-LPT test results for workers with limited exposure potential. While these commenters agreed that some level of worker beryllium exposure should trigger the medical surveillance program, neither provided recommendations for an appropriate trigger level.

One commenter (Ex. 16) suggested that DOE use a graded approach to the medical surveillance program which would include current beryllium workers and other workers with exposures or potential exposures at or above the action level. DOE has

determined that a graded approach linked to exposure at or above the action level would not ensure the necessary surveillance of all DOE and contractor workers who may have had exposure to beryllium, whether current or past.

Several commenters (Exs. 2, 14, 16, 17, 28, 29, 30, 31) favored the inclusion of all potentially exposed workers in the medical surveillance program regardless of the measured exposure level. These commenters argued that medical surveillance should not be limited to workers exposed to levels of beryllium at or above the action level, but rather should include all workers with the potential for any beryllium exposure. Three of these commenters stated that current scientific evidence does not indicate a "safe" level of beryllium exposure, and that CBD has been identified in individuals thought to have only low or incidental exposure to beryllium. Their concern was that restricting medical surveillance to "beryllium workers," as defined in proposed section 850.3, would exclude such workers, who in their view are also at risk of contracting CBD. In addition, two of the commenters (Exs. 28, 30) noted that allowing workers exposed at any level to participate in the medical surveillance program would act as an incentive for employers to minimize the number of individuals who work in beryllium areas.

Similarly, three commenters (Exs. 28, 29, 31) argued that current workers with past beryllium exposures should be offered the opportunity to participate in the medical surveillance program. One commenter (Ex. 31) noted that, based on the proposed definition of "beryllium worker," medical surveillance would not be made available to current workers with past beryllium exposure unless they were covered under the medical removal provisions of proposed section 850.34. Another commenter (Ex.15) suggested that all employees at DOE facilities, even those with no exposure to beryllium, should be given the option of participating in the medical surveillance program.

Several commenters (Exs. 2, 16, 28, 31, 19) raised the issue of medical surveillance for former workers with past beryllium exposures who no longer work at a DOE facility. The commenters stated that former DOE workers should also be provided the opportunity to participate in medical monitoring. They acknowledged DOE's proposed establishment of a separate, directly funded program that offers medical examinations to former workers at risk of developing CBD. However, two of the commenters (Exs. 16, 31) argued that this program should be made available to former workers at the same time as the program for current workers. Another commenter argued that maintaining two separate databases and programs was not practical.

DOE has revised the final rule to require responsible employers to provide medical surveillance for all beryllium-associated workers. DOE based this revision on the beryllium cases suggesting that low and even incidental exposure to beryllium can lead to sensitization or beryllium disease. This approach will ensure the early identification of workers at risk of health effects from exposure to beryllium, provide the greatest protection of worker health, and provide a more complete documentation of beryllium exposures. Beryllium-associated workers eligible for medical surveillance include any current worker who is exposed or was exposed or potentially exposed to airborne concentrations of beryllium at a DOE facility. Thus medical surveillance will be available to a beryllium worker (as defined in section 850.3), a current worker whose work history shows that the worker may have been exposed to airborne concentrations of beryllium at DOE facilities, a current worker who exhibits signs and symptoms of beryllium exposure, and a worker who is receiving medical removal protection benefits.

Section 850.34(a)(2) requires responsible employers to designate a Site Occupational Medical Director (SOMD) who will be responsible for administering the medical surveillance program. One commenter (Ex. 18) stated that a panel comprised of individuals representing management, labor, the public, and the local medical community should select the SOMD. DOE has not adopted this recommendation because DOE believes that the responsible employer must have ultimate responsibility for ensuring compliance with this requirement.

A number of commenters (Exs. 12, 14, 20, 23) were concerned about the quality of health care for workers with CBD and, more specifically, whether or not workers would have a choice of physicians. One commenter (Ex. 20) pointed out that OSHA no longer restricts the performance of medical evaluations to licensed physicians because this requirement is too prescriptive and fails to recognize the realities of today's health care system. This commenter suggested adding a provision to include other licensed health care professionals among those who may perform medical evaluations.

DOE agrees with this commenter and has revised section 850.34(a)(3) of the final rule to require responsible employers to ensure that all medical evaluations and procedures are performed by or under the supervision of a licensed physician who is familiar with the health effects of beryllium. Although a licensed physician is the appropriate person to supervise and evaluate a medical evaluation, certain required elements of the evaluation may be performed by another, appropriately qualified person under the supervision of the physician. The licensed physician is required to be familiar with the health effects of beryllium. DOE expects that the medical evaluations and procedures required to diagnose CBD will be performed or validated by a specialist in pulmonary medicine, occupational medicine, or other physician with specialized equipment and examination protocols required to definitively differentiate between CBD and other lung diseases. DOE believes that this is necessary due to the unusual nature of CBD and the fact that not all physicians are familiar with the evaluation of beryllium-associated patients.

Three commenters (Exs. 15, 18, 22) expressed concern about certain language in the NOPR preamble that they interpreted to mean that workers would be limited to an evaluation performed by an employer's physician. One commenter (Ex. 22) suggested that DOE adopt OSHA's Lead Standard as a model for selecting physicians. DOE never intended to limit an employee's choice of physicians. To clarify this point, DOE has included in section 850.34, paragraphs (c) and (d), provisions for a multiple physician and alternate physician review. These provisions are explained in the discussion that follows.

DOE views medical surveillance as a primary tool for determining the extent of CBD risk within the worker population. Therefore, section 850.34(a)(4) requires responsible employers to maintain and give to the SOMD a list of beryllium-associated workers who may be eligible for medical surveillance. The list must be based on hazard assessments, exposure records, and any other information that will identify beryllium-associated workers (section 850.34(a)(4)(i)). In addition, section 850.34(a)(4)(ii) requires responsible employers to regularly update the list based on the information from the periodic evaluations performed pursuant to paragraph (b)(2) of this section.

One commenter (Ex. 16) questioned why DOE proposed to give the SOMD the task of identifying working conditions that contribute to the risk of CBD and determining the need for

additional exposure controls. This commenter believed that this task should be performed by an industrial hygienist. Similarly, another commenter (Ex. 23) stated that the SOMD should not be responsible for performing data analysis to determine which workers should be included in the medical surveillance program, or for maintaining the list of beryllium workers at a site. The commenter argued that both of these tasks are management functions that should be carried out by the responsible employer based on technical guidance provided by the industrial hygiene department and the SOMD. DOE agrees with both of these commenters. The responsible employer, not the SOMD, should have the function of identifying working conditions and evaluating the need for workplace controls. Consequently, DOE has revised the final rule to require that responsible employers identify beryllium-associated workers. However, medical judgments that are requisite to management decisions are the SOMD's responsibility.

Section 850.34(a)(5) requires the responsible employer to provide the SOMD with the information needed to operate and administer the medical surveillance program. This information includes, but is not limited to, the baseline beryllium inventory, hazard assessment results, and exposure monitoring data, as well as information regarding the identity and nature of activities or operations on the site that are covered under the CBDPP, the related duties of beryllium workers, and the types of personal protective equipment employed in the performance of these duties.

Section 850.34(a)(6) requires the responsible employer to provide the SOMD and the examining physician with (1) A copy of this rule and its preamble; (2) a description of the workers' duties as they pertain to beryllium exposure; (3) records of the workers' beryllium exposure; and (4) a description of personal protective and respiratory protective equipment in current or anticipated use. DOE believes that this information is necessary to ensure that the physician can make informed decisions regarding the required content of the medical evaluation and the subsequent development of recommendations related to each beryllium-associated worker.

Several commenters (Ex. 8, 17, 18, 19) suggested including provisions for providing beryllium education and training programs to physicians and other health care providers in the rule. DOE has not adopted this suggestion, because it would expand the scope of the rule.

Section 850.34(b) requires responsible employers to provide, without cost to beryllium-associated workers, all medical evaluations and procedures performed to comply with these regulations. This section also requires that all evaluations and procedures be performed at a time and place that are convenient for the worker. This provision is consistent with similar provisions in OSHA's expanded health standards. This section also requires responsible employers to provide the SOMD with a list of beryllium-associated workers who may be eligible for protective measures under the rule.

Section 850.34(b)(1) requires responsible employers to provide a baseline medical evaluation to beryllium-associated workers. The purpose of the baseline medical evaluation is to: (1) Establish the current health status of the worker and determine whether it is appropriate to assign the worker to jobs with beryllium exposure; (2) initially determine what level of medical surveillance the responsible employer must provide to the worker; and (3) establish essential baseline data for the worker which is used to assess subsequent health changes attributable to beryllium exposure.

DOE received a number of comments regarding baseline medical evaluations and medical testing. One commenter (Ex. 25) requested clarification as to the differences between pre-placement exams, as specified in DOE Notice 440.1, "Interim Chronic Beryllium Disease Prevention Program," and the baseline exams specified in the NOPR. The final rule will supersede DOE Notice 440.1, and the interim medical surveillance program requirements will be replaced with those of the final rule. The final rule does not refer to pre-placement exams. Another commenter (Ex. 23) recommended that the meaning of spirometry be clarified to ensure consistency. DOE agrees and has specified the measurement of forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_1) in section 850.34(b)(1)(v) of the final rule.

A commenter (Ex. 19) questioned the value of baseline pulmonary function tests and x-rays. This commenter suggested that baseline studies cannot be used to determine which health changes are related to work hazards and which are related to other activities or disease processes. This commenter favored the approach of following patients clinically and using Be-LPT and other studies, to augment clinical impressions. Early identification of CBD, this commenter states, might have no positive effect on the course of the disease.

DOE disagrees with this comment. Early identification and intervention are important for identifying workers at higher risk of exposure to beryllium, and for preventing and minimizing the effects of beryllium-induced disease. DOE's position is supported by a commenter (Ex. 29) who stated that while spirometry and X-rays may not be predictive, X-rays have in some instances identified CBD cases in individuals who had a normal Be-LPT. This commenter stated that these cases are likely to be missed if spirometry and X-rays are not required, and also recommended X-ray screening for Be-LPT negative individuals with persistent chest problems. Another commenter (Ex. 19) emphasized the benefits of good data collection to determine if early removal of beryllium sensitized workers prevents the progression to CBD.

One commenter (Ex. 33) suggested that, if available, recent chest X-rays be utilized for the baseline medical evaluation to reduce X-ray exposure. DOE agrees that if previous chest X-rays have been conducted, for a baseline beryllium evaluation, additional X-rays should not be used unless specified by a physician. However, to ensure that the chest X-ray correlates with other diagnostic and historical information, only those X-rays taken for the purpose of a baseline beryllium evaluation or equivalent evaluation should be used to establish a baseline.

Section 850.34(b)(1)(vi) requires responsible employers to provide a Be-LPT as part of the baseline evaluation. The Be-LPT is the only available laboratory test for determining individual immune response to beryllium in vitro. Its use in a surveillance program will permit detection of beryllium-related health effects at a pre-clinical stage. A positive Be-LPT would indicate the need for further evaluation to determine the presence of CBD. The use of the Be-LPT as an evaluation tool provides an early opportunity for diagnosis and treatment of CBD.

Finally, section 850.34(b)(1)(vii) authorizes the examining physician to make available to the worker any additional tests deemed medically necessary. DOE believes that it is important that the examining physician have such discretion because individuals may exhibit different responses to beryllium. In this regard, one commenter (Ex. 16) expressed concern regarding proposed section 850.33(i), which provided that workers

would be referred for further diagnostic evaluation if there were two or more positive Be-LPTs. The commenter interpreted this provision as a mandatory requirement. DOE's intent is that workers have the opportunity for additional testing if recommended by the examining physician. A worker is not required by the rule to undergo additional medical evaluation and treatment.

One commenter (Ex. 29) recommended clinical referral for additional diagnostic tests after one positive Be-LPT, instead of two or more as proposed by DOE. DOE believes that the examining physician is in the best position to determine which additional tests, if any, would be useful in evaluating the health of an individual worker. Therefore, DOE has removed the requirement for follow-up testing based on two or more positive Be-LPT tests, relying instead on the examining physician's discretion under section 850.34(b)(1)(vii) to order follow-up tests when appropriate.

Section 850.34(b)(2) requires responsible employers to provide medical evaluations to beryllium workers annually, and to other beryllium-associated workers every 3 years. Responsible employers must provide the periodic medical evaluation elements described in section 850.34(b)(2)(i) to detect, at an early stage, any pathological changes that could lead to CBD or be aggravated by beryllium exposure. By detecting abnormalities early, workers may be medically removed to prevent further beryllium exposure.

Section 850.34(b)(2)(ii) requires responsible employers to provide to beryllium-associated workers a chest radiograph (X-ray) every 5 years. DOE includes this requirement for periodic X-rays because X-rays have been shown to be effective in the early detection of beryllium-related health effects (Ex. 29).

Following an emergency in which a worker, who is not already participating in the beryllium medical surveillance program, is exposed to an elevated amount of beryllium, the responsible employer is required by section 850.34(b)(3) to provide a medical evaluation as soon as possible.

A commenter (Ex. 23) suggested that a standard respiratory symptom questionnaire, medical work history form, and physical examination form be used at all DOE sites for consistency. DOE agrees that such standardized forms may help ensure consistency across the DOE complex, but is concerned that mandating the use of standardized forms may limit the discretion of the SOMD in determining the appropriate medical surveillance for each individual. Accordingly, DOE has decided to include appropriate standardized forms as non-mandatory guidance in an implementation guide to accompany the final rule. Another commenter (Ex. 29) was concerned that the NOPR required a respiratory symptom questionnaire for periodic medical evaluations, but not for the baseline evaluation. DOE acknowledges this oversight and has included the respiratory symptom questionnaire as part of both the periodic and baseline medical evaluations in sections 850.34(b)(1)(ii) and (b)(2)(I)(B) of the final rule.

Section 850.34(c) requires responsible employers to establish a multiple physician review process for affected beryllium-associated workers. DOE has identified three benefits of providing a multiple physician review process: (1) to strengthen and broaden the bases for medical decisions made pursuant to this rule when a beryllium-associated worker questions the findings, recommendations, or determinations of an initial physician retained by the responsible employer; (2) to increase beryllium-associated workers' confidence in the soundness of medical findings, recommendations and determinations made under this rule; and (3) to increase beryllium-associated worker's acceptance of, and participation, in the medical surveillance program.

Given the shortage of trained and experienced occupational physicians, it is possible that some physicians performing examinations or consultations under the beryllium rule will misdiagnose CBD. However, rather than requiring multiple medical opinions in all cases, which would be expensive and potentially wasteful, DOE is providing to beryllium-associated workers an opportunity to obtain an independent review of the findings, determinations or recommendations of the physician selected by the responsible employer. Over time, this independent review is likely to show either that a perceived low level of confidence in the physician retained by the responsible employer is unwarranted, or that the responsible employer should improve the quality of the medical surveillance being provided. In either case, the multiple physician review process will have served a beneficial purpose.

In section 850.34(c)(1), a beryllium-associated worker may designate a second physician to review any findings, determinations, or recommendations of the physician chosen by the responsible employer, and to conduct such examinations, consultations, and laboratory tests as the second physician may deem necessary to facilitate this review. The responsible employer's obligation to provide information to the examining physician extends to other physicians involved in the multiple physician review or alternate physician review process so that all of the physicians involved will have an equal opportunity to assess the beryllium-associated worker's health status.

Section 850.34(c)(2) requires that after an initial physician conducts an examination or consultation, the responsible employer must promptly notify the worker of his or her right to seek a second medical opinion. This notification must be in writing.

Section 850.34(c)(3) requires that after the worker is notified of this right, the responsible employer may condition its participation in, and payment for, multiple physician review upon the worker, within 15 days after receipt of the notification or the initial physician's written opinion, whichever is later, both (1) informing the responsible employer that the worker intends to seek a second medical opinion, and (2) initiating steps to make an appointment with a second physician.

The rule contains no limitation on a beryllium-associated worker's choice of a second physician, except the requirement in section 850.34(a)(3) that the second physician must be a licensed physician who is familiar with the health effects of beryllium.

If the second physician's findings, determinations, and recommendations are the same as those of the initial physician, then the multiple physician review process comes to an end. However, as provided in section 850.34(c)(4), if the opinions of the two physicians are in conflict, then the responsible employer and the beryllium-associated worker must undertake to encourage the two physicians to resolve any disagreement. DOE expects that the two physicians will communicate with each other to resolve their differences, but the rule requires the responsible employer and worker to encourage such a resolution. In most cases, this professional interaction should resolve any differences of opinion.

In cases where differences remain, these differences of opinion are likely to be genuine and substantial. If the first two physicians are unable to resolve expeditiously any differences of opinion with respect to a beryllium-associated worker, then it is necessary for a third qualified physician to resolve the dispute. It is critical that this third

physician has the confidence of those concerned and is competent to resolve the dispute. Consequently, section 850.34(c)(5) requires that the responsible employer and the beryllium-associated worker together, through their respective physicians, must designate the third physician.

Under section 850.34(c)(5) the third physician will have a full opportunity to review the findings, determinations, and recommendations of the two prior physicians, and to conduct such examinations, consultations and laboratory tests as the third physician deems necessary. DOE's expects that the third physician will consult with the other two physicians. The third physician should provide a written medical opinion to the SOMD which will be used to resolve the disagreement between the other two physicians. Section 850.34(c)(6) requires the SOMD to act in a manner consistent with the findings, determinations, and recommendations of the third physician, unless the SOMD and the beryllium-associated worker reach an agreement that is otherwise consistent with the recommendations of at least one of the other two physicians.

Since the multiple physician review process will be a means by which medical surveillance is provided to a beryllium-associated worker, responsible employers must bear the expense of this process when it is used. Based on OSHA's practice and experience with multiple physician review in its health standards, DOE does not expect the costs of this process to be burdensome to the responsible employers. If responsible employers establish and administer medical surveillance programs that engender worker confidence, workers should have little or no need to seek second medical opinions.

The requirement for multiple physician review is not intended to preclude responsible employers from establishing and implementing alternate medical protocols. DOE has included language in section 850.34(d) to provide for alternate physician determination. Under that section, the responsible employer and beryllium-associated worker, or the worker's designated representative, may agree upon the use of any expeditious alternate physician determination process, instead of the multiple physician review process. The only condition is that the alternate process be no less protective of the worker's health than the multiple review process. For example, a jointly agreed upon physician might be used in the first instance without recourse to other physicians. DOE encourages responsible employers and workers to adopt medical determination procedures in which all parties have trust and confidence.

Section 850.34(e)(1) requires the SOMD to provide to responsible employers, within two weeks after receipt of results, a written and signed medical opinion after each medical evaluation of a beryllium-associated worker. The purpose of requiring the SOMD to give the responsible employer a written opinion is to inform the responsible employer of the medical basis for determining the job placement of the examined worker. This written medical opinion, as described in section 850.34(e)(i–iii), must contain any diagnosis of the worker's condition related to occupational exposure to beryllium; any other detected medical conditions relevant to further beryllium exposure; any recommended restrictions on the worker's exposure to beryllium or on the use of protective clothing or equipment; and a statement indicating that the SOMD or the examining physician has provided to the worker the results of the test, the medical evaluation, including all tests results and any medical condition related to beryllium exposure that requires further evaluation or treatment.

Section 850.34(e)(2) requires the SOMD to withhold from the responsible employer, orally or in the written medical opinion, specific findings or diagnoses not related to occupational exposure to beryllium.

Two commenters (Ex. 23, 28) expressed concern regarding proposed section 850.33(j)(2), which stipulated that the physician's written medical reports be delivered within 15 calendar days after the completion of a medical evaluation. The commenters noted that Be-LPT tests are time-consuming and may exceed the 15-day time frame, and suggested that the 15-day period should begin after receipt of the test results. DOE agrees, and has revised section 850.34(f) to require the SOMD to give beryllium-associated workers a written medical opinion containing the results of all medical tests or procedures, an explanation of any abnormal findings, and any recommendation that the worker be referred for additional testing within 10 working days after the SOMD's receipt of test results.

In section 850.34(f)(2), upon request by the beryllium-associated worker, the responsible employer is required to provide the worker with a copy of the information the responsible employer is required to provide to the examining physician.

Section 850.34(g) requires the responsible employer to report on the applicable OSHA reporting form (currently OSHA Form No. 200) beryllium sensitization, CBD, or any other abnormal condition or disorder of workers caused or aggravated by occupational exposure to beryllium. Although not included in the proposed rule, this provision reflects current practices and does not impose a new burden on employers. Reporting abnormal conditions and disorders that are occupationally caused and beryllium-related will contribute to the development of occupational health statistics that eventually may lead to improved disease prevention and medical intervention for beryllium-associated workers. It will also provide DOE with information and data helpful in assessing the effectiveness of the CBDPP rule and in considering what, if any, modification should be made to the rule in the future.

Section 850.34(h)(1) requires responsible employers to establish a routine and systematic analysis of medical, job, and exposure data. The purpose of this requirement is to collect and analyze information so that the prevalence of disease can be accurately described and conclusions reached on causes or risk factors for the disease. This data analysis is an effective means of measuring performance under the CBDPP, and for correcting and improving the CBDPP. Section 850.34(h)(2) requires the responsible employer to use the results of these analyses to determine which workers should be offered medical surveillance and the need for additional exposure controls.

Section 850.35—Medical Removal

Section 850.35 (proposed as section 850.34) requires responsible employers to establish medical removal protection (MRP) and medical removal protection benefits (MRPB) as part of the CBDPP.

Medical surveillance can only be effective in detecting and preventing disease if beryllium-associated workers: (1) voluntarily seek medical attention when they feel ill; (2) refrain from efforts to conceal their true health status; and (3) fully cooperate with examining physicians to facilitate accurate medical diagnoses and effective treatment. This sort of worker participation and cooperation cannot be evoked by coercion; it will occur only where no major disincentives to meaningful worker participation exist. Without such participation, it would be much more difficult, if not impossible, to adequately monitor workers' health and to identify workers who need temporary or permanent medical removal.

MRP is a logical result of medical surveillance. Without MRP, responsible employers would be free to maintain high-risk workers in their current jobs, which would not be sufficiently protective of their health. Alternatively, responsible employers could choose to terminate workers or transfer them from higher-paying, beryllium-exposed jobs to lower-paying, non-beryllium jobs. This might be protective, but it would impair the workers' standards of living. In either case, the effectiveness and integrity of the medical surveillance program would be compromised.

With MRP, beryllium-associated workers are assured of being removed to jobs where exposure to beryllium is low if such removal is determined to be necessary to protect their health. With MRPB, workers are assured that, if they fully participate in medical surveillance and if the results of medical surveillance require removal from their beryllium exposed jobs, their normal earnings and job status will be protected for a pre-determined period.

Thirty-two commenters (Ex. 12 is a form letter submitted by 16 beryllium workers) commented on the proposed MRP and MRPB provisions in the NOPR. They addressed a wide variety of issues and frequently expressed opposing viewpoints. For instance, two commenters (Exs. 16, 26) stated that the proposed MRP provisions went too far (e.g., two years of protection is too long; accepted applicants should not be included under the provisions), while others (Exs. 3, 8, 12, 14, 17, 18, 22, 24, 28, 29, 31) stated that the provisions did not go far enough (e.g., two years of protection is not long enough; one follow-up examination is not enough; the training costs limits are too restrictive; the rule should provide provisions for multiple physician reviews). Several commenters (Exs. 20, 22, 31) argued against the voluntary nature of the proposed provisions, stating that it would be unethical to allow a worker with CBD to continue to be exposed to beryllium, and suggesting that workers could be wrongfully pressured into staying in beryllium-related jobs. Other commenters (Exs. 29, 30) agreed with DOE's proposal to require employee consent, and requested that DOE provide additional guidance to help workers make more informed decisions regarding their medical removal. DOE has decided, consistent with some of the comments, to use the provisions of OSHA's expanded health standards as the basis for the MRP and MRPB provisions of the final rule. DOE has modeled the MRP and MRPB provisions of this final rule upon similar provisions in OSHA's Cadmium, Lead and Benzene standards, 29 CFR 1910.27, 1910.1025 and 1910.1028, respectively. DOE's rationale for each provision of section 850.35 in the final rule is discussed below.

Section 850.35(a) requires responsible employers to offer a beryllium-associated worker medical removal from exposure to beryllium on each occasion that the SOMD determines in a written medical opinion that medical removal is required. The SOMD's determination must be based upon one or more positive Be-LPT results, CBD diagnosis, an examining physician's recommendation, or any other signs or symptoms the SOMD deems medically sufficient to show that the worker has a medical condition that places the worker at increased risk of material impairment to health from further exposure to beryllium.

Section 850.35(a)(1) deals with temporary removal. It requires the responsible employer to offer temporary medical removal to a beryllium-associated worker whenever the SOMD determines in a written medical opinion that the worker should be removed pending a final medical determination on the worker's health. The responsible employer must offer to temporarily remove a worker regardless of whether a job is available into which the removed worker may be transferred. If no such job is available, the responsible employer must pay medical removal protection benefits to the worker for up to one year. Section 850.35(a)(1) (iii) and (iv) require that for each time a beryllium-associated worker is temporarily removed, the responsible employer must maintain the worker's total normal earnings, seniority and other employment rights as if the worker were not removed, either by providing an appropriate alternative job or by paying MRPB, for one year.

If a final medical determination is made that the worker does not have a medical condition which places the worker at increased risk of material impairment to health from exposure to beryllium, the temporary MRP must be lifted so that the affected worker may return to his or her normal duties.

Section 850.35(a)(2) requires the responsible employer to offer beryllium-associated workers permanent medical removal whenever the SOMD determines in a written medical opinion that the beryllium-associated worker should be permanently removed from exposure to beryllium. Once a worker is permanently removed, the worker will receive the medical removal protection benefits specified in section 850.35(b) of this rule.

Section 850.35(a)(3) is intended to ensure that beryllium-associated workers are given the information needed to make an informed decision on whether to accept temporary or permanent removal from a job with a potential for beryllium exposure.

Section 850.35(a)(4)(i) prohibits the responsible employer from returning a beryllium-associated worker who has been permanently removed to the worker's former job status, unless the SOMD has determined in a written medical opinion that removal is no longer necessary to protect the worker's health, or the exception in section 850.35(a)(4)(ii) applies. Under section 850.35(a)(4)(ii), if there are special circumstances that make medical removal an inappropriate remedy, or if the SOMD's professional opinion is that continued exposure will not pose an increased risk to the worker's health (e.g., the potential decrements to the worker's lung function are not projected to be any greater if the worker were permitted to continue on the job than they would be if the worker were removed), the SOMD must fully discuss the matter with the worker and, in a written medical determination, may recommend returning the worker to his or her former job status. The purpose of this exception is to provide some flexibility where it is reasonably clear that returning the worker to his or her normal job is unlikely to adversely affect the worker's health. For example, a return to work may be justified if a worker who is not experiencing a decrease in lung function, has been on medical removal for 2 years and is about to retire, and the time that the worker will continue to be occupationally exposed at or above the action level is very limited. If the SOMD recommends return of the worker in such cases, the SOMD may require the responsible employer to provide the worker with additional protection, such as a supplied air respirator operated in a positive pressure mode. In any event, a decision to return the worker should be made only after the SOMD has fully explained the relevant facts and prognoses to the worker.

Section 850.35(b) establishes the MRPB that must be provided to removed workers. DOE believes that the establishment of MRPB is critical to minimize the disability associated with CBD. Removal from exposure and effective job-placement efforts, coupled with early diagnosis and treatment, will increase the likelihood that affected beryllium-associated workers will continue as productive members of the DOE workforce. In addition, MRPB will encourage worker participation in the

medical surveillance program by providing beryllium-associated workers with a reasonable level of assurance that a finding of sensitization or diagnosis of CBD will not lead to the loss of their employment.

Under section 850.35(b)(1), the responsible employer is required to provide up to two years of MRPB to a beryllium-associated worker on each occasion that he or she is medically removed from exposure to beryllium in accordance with this part.

Section 850.35(b)(2) requires the responsible employer to provide the "total normal earnings, seniority, and all other workers rights and benefits" of a removed beryllium-associated worker as if the worker had not been removed. The purpose of this requirement is to ensure that a removed worker does not suffer economic loss due to the removal. Thus, if a removed worker routinely earned overtime pay on the job from which he or she was removed and would have continued to do so during the removal period, then MRPB must include the amount of expected overtime as part of the worker's "total normal earnings." DOE selected 2 years as the maximum period during which the responsible employer is required to pay MRBP to a worker who accepts removal instead of the 18 month protection period established in OSHA's Lead and Cadmium standards. DOE has established a different protection period for beryllium because of the toxicological differences between beryllium and the two metals covered in the OSHA standards. Specifically, the early stages of the health impairments associated with exposure to lead or cadmium will reverse in time with no additional exposure, but beryllium sensitization and CBD will not. The objective of OSHA's 18 month period is to provide workers with sufficient recovery time so that they can return to their job. The objective of DOE's 24 month period, however, is to allow beryllium-associated workers who accept permanent medical removal sufficient time to be retrained and placed in different job. DOE believes that this period should be long enough to enable the majority of removed beryllium-associated workers to be retrained and placed in another job or, for those workers who can be returned to their former job status, to be returned before their MRPB expire.

Under section 850.35(b)(3), if a removed worker files a claim for workers' compensation payments for a beryllium-related disability, the responsible employer must provide MRPB pending disposition of the claim. The responsible employer receives no credit for the workers' compensation payments received by the worker for treatment related expenses.

In section 850.35(b)(4), the responsible employer's obligation to provide MRPB is reduced by the amount of any compensation the beryllium-associated worker receives from any other source for earnings lost during the period of removal. This provision is necessary to ensure that MRPB does not result in a "windfall" to the worker who collects other compensation, including salary from another job, while the worker is on medical removal from exposure to beryllium.

Section 850.35(b)(5) provides that the requirement that a responsible employer provide MRPB is not intended to expand upon or restrict any rights a worker has or would have had, absent medical removal, to a specific job classification or position under the terms of a collective bargaining agreement.

Section 850.35(b)(6) provides that a responsible employer may condition the provision of MRPB upon the beryllium-associated worker's participation in medical surveillance. Thus, although the rule does not require worker participation in medical surveillance, it permits the responsible employer to deny economic protection to workers who are unwilling to participate in medical surveillance. Since the responsible employer must bear the financial burden of medical removal, the employer has a legitimate interest in minimizing the need for medical removal. Unless workers participate in medical surveillance, the responsible employer may not be able to identify workers whose exposure to beryllium should be reduced to avoid the need for medical removal.

In providing the responsible employer the authority to condition provision of MPRB upon a beryllium-associated worker's participation in medical surveillance, DOE does not intend to permit an employer to deny MRPB for insignificant lapses in such participation. The worker's actions should be assessed reasonably, in light of the goal of prevention of disease and the employer's interest in minimizing the need for medical removal.

Section 850.36—Medical Consent

Section 850.36 (proposed as section 850.35) establishes the medical consent provisions of the CBDPP. Because worker participation in the medical surveillance program established by this rule is voluntary, this section is necessary to ensure that beryllium-associated workers receive adequate information to make an informed decision regarding their participation in the program.

Section 850.36(a) requires responsible employers to provide beryllium-associated workers with a summary of the medical surveillance program, the type and purpose of data to be collected, how the data will be maintained, and protections for ensuring the confidentiality of medical records. Responsible employers must provide this information at least one week before any medical evaluation or tests, or when requested by the worker.

Section 850.36(b) requires responsible employers to provide beryllium-associated workers with information on the benefits and risks of the medical tests and examinations offered as part of medical surveillance. This information must be provided at least one week prior to any examination or test. DOE expects responsible employers to make reasonable efforts to help workers understand the material. Accordingly, section 850.36(b) requires responsible employers to give beryllium-associated workers an opportunity to ask questions and receive answers before a medical evaluation is performed.

Section 850.36(c) requires responsible employers to have the SOMD obtain the beryllium-associated worker's signature on the informed consent form found in Appendix A to this part, before medical evaluations or tests are performed.

Section 850.37—Training and Counseling

Section 850.37 (proposed as section 850.36) establishes requirements for training and counseling workers regarding exposure to beryllium, and the potential health effects associated with such exposure. This worker training is necessary because the appropriate implementation of the required workplace procedures of the CBDPP ultimately rests upon the front-line workers who will be performing work on, with, or near beryllium or beryllium-contaminated materials. These workers cannot be expected to implement the required CBDPP procedures if they are not aware or fully appreciative of the significance of these procedures.

DOE expects that responsible employers will conduct training in a manner that is easy to understand. Training material should be appropriate in content and vocabulary to the education level, and language background of affected workers. The goal of training is to ensure that all workers, regardless of cultural or educational background, have the knowledge necessary to reduce and minimize their exposure to beryllium.

Section 850.37(a)(1) requires responsible employers to develop and implement a worker training program for beryllium-associated workers and all other individuals who work at a site where beryllium activities are conducted, and ensure their participation in the program. DOE recognizes that OSHA's Hazard Communication standard (29 CFR 1910.1200) already requires that employers provide their workers with training regarding the risks associated with all hazardous materials in the workplace. DOE does not intend that employers would implement separate and redundant training and information programs to comply with both this rule and the Hazard Communication standard. Accordingly, sections 850.37(b)(1) and (2) require responsible employers' CBDPP training and information programs to comply with the Hazard Communication standard as well as address the contents of the CBDPP. Through this provision, DOE intends for responsible employers to integrate their CBDPP training and information efforts into their existing Hazard Communication training program. This will minimize the burden on responsible employers and provide for a consistent approach to worker training and the communication of workplace hazards.

DOE added "contents of the CBDPP" to the training requirements in section 850.37(b) because this information is essential for a worker to understand how to effectively participate in the CBDPP. OSHA's Hazard Communication standard (29 CFR 1910.1200) does not explicitly refer to anything like a CBDPP. In the final rule, DOE has removed specific mention of several subjects (beryllium health risk, exposure reduction, and safe handling of beryllium and medical surveillance) that were specifically identified in the proposed rule. These subjects are adequately covered in the Hazard Communication standard.

One commenter (Ex. 3) recommended detailed training for workers who have had, or are likely to have, exposures to beryllium because their assigned tasks may have involved beryllium. DOE generally agrees with the commenter and in the final rule has used a performance-based approach to identifying the workers to be trained. Section 850.37(b), paragraphs (1) and (2), require detailed training for beryllium-associated workers.

In the NOPR (Section V, Request for Information), DOE stated that it was considering including a requirement that responsible employers develop and implement an outreach education program for family members of beryllium workers. Commenters generally agreed on the need to inform workers' families about beryllium hazards, but had different views about how it should be accomplished. Two commenters (Exs. 16, 26) recommended that an outreach requirement not be included in the rule and, instead, that workers be relied upon to relay beryllium information to their families. Several other commenters (Exs. 17, 28, 30, 31) recommended that DOE include an outreach requirement in the rule, and require employers to provide beryllium information without relying on the workers. After considering all of the comments, DOE has added section 850.37(b)(3), which requires the responsible employer to provide to its workers information about risks to family members. This section relies upon the workers to relay the relevant beryllium hazard information to their families. DOE encourages responsible employers to provide beryllium-associated workers with information about beryllium risks that is readily understandable to family members and others, as well as to the workers.

One commenter (Ex. 4) recommended that the requirement for outreach not be included as part of the rule, but that DOE provide outreach information from a central point in DOE. The commenter felt that this approach would be more efficient than having each responsible employer develop and provide its own outreach information. DOE disagrees with this comment, and is of the view that more effective outreach will be provided if responsible employers include information about beryllium risks to families and others as part of the detailed training provided to beryllium-associated workers and those who use protective clothing and equipment.

One commenter (Ex. 3) recommended general awareness training for workers who are not beryllium-associated workers but who, at some time, may be at risk because they work at a site where beryllium activities are conducted. DOE agrees with this recommendation, and section 850.37(c) requires the responsible employer to provide general awareness training about beryllium hazards and controls to these workers.

Section 850.37(d) requires that the responsible employer provide training to workers prior to initial assignment and at least every two years thereafter to ensure that workers are appropriately prepared to deal with the hazards and risks of working with beryllium. The initial training requirement of this paragraph is important to ensure that workers have the information they need to protect themselves before they are actually subject to exposure or potential exposure hazards. Periodic training is necessary to reinforce and update initial training, especially with regard to the protective actions workers must take at their current jobs to reduce their potential for exposure to beryllium. DOE has established the frequency of two years as a minimum requirement, rather than the proposed one year.

Section 850.37(e) requires the responsible employer to provide additional training when the employer has reason to believe that a beryllium worker lacks the proficiency, knowledge, or understanding needed to work safely with beryllium. This situation could occur because of changes in workplace operations, controls, or procedures or the availability of new or updated information regarding the health risk associated with exposures to beryllium. Also, a worker's performance may show that the worker has not retained the requisite proficiency. DOE used the retraining requirements of the OSHA scaffold standard (29 CFR 1926.454(c)) as a model for section 850.37(e).

Section 850.37(f) requires the responsible employer to develop and implement a worker counseling program to assist beryllium-sensitized workers and workers diagnosed with CBD. The purpose of the counseling program is to communicate to workers information that may help them make important health-and work-related decisions and perform administrative activities, such as filing workers' compensation claims. This section also requires the responsible employer to communicate information concerning the following topics: the medical surveillance program; medical treatment options; medical, psychological, and career counseling; medical benefits; administrative procedures and worker rights under applicable workers' compensation laws and regulations; work practices aimed at limiting worker exposure to beryllium; and the risk of continued exposure after sensitization.

One commenter (Ex. 23) cautioned that the proposed language dealing with workers' compensation counseling could have been interpreted as imposing obligations that exceed employer obligations under states' workers' compensation statutes. DOE has included in section 850.37(f) the qualifying language "administrative procedures and worker rights" and "under applicable workers' compensation laws and regulations" to make clear that DOE does not intend to establish any new workers' compensation obligations. DOE understands that responsible employers

may develop such counseling programs in consultation with labor organizations representing covered workers, and that employers may wish to advise the workers to consult their own attorneys on these matters.

Another commenter (Ex. 22) recommended that beryllium training be provided by organizations or persons who receive grants from DOE. This commenter asserted that it is inappropriate for DOE contractors, who are responsible employers, to conduct beryllium training because these employers are not sufficiently independent. DOE does not agree with this comment and has not adopted this recommendation. The vast majority of DOE's safety and health training is currently being conducted adequately by responsible employers, and it is common outside of DOE for employers to provide safety and health training to their employees.

One commenter (Ex. 21) recommended that this section be revised to include the adult education principles outlined in Appendix E of OSHA's Hazard Communication standard (29 CFR 1910.1200) because these principles have been effective when applied to training workers. While DOE has not explicitly referenced this advisory Appendix in the final rule, nothing in the rule prohibits its use. Although the Appendix appears to be a good example of the use of adult educational principles that an employer could use to train workers on their hazard communication program, it does not expressly identify or describe these principles. Responsible employers would have to infer the principles from Appendix E and then apply those principles to their beryllium training program. In addition, DOE believes that an explicit reference to this Appendix in the rule would be confusing because this Appendix is not specifically applicable to beryllium training.

Section 850.38—Warning Signs and Labels

Section 850.38 (proposed as section 850.37) requires responsible employers to post warning signs and labels to ensure that the presence and dangers associated with beryllium and beryllium-contaminated materials or areas are communicated to workers. Section 850.38(a) requires the posting of warning signs at all entranceways to established regulated areas and that these signs bear the following warning:

DANGER
BERYLLIUM CAN CAUSE LUNG DAMAGE
CANCER HAZARD
AUTHORIZED PERSONNEL ONLY

The purpose of these signs is to minimize the number of persons in a regulated area by warning workers prior to entry. The signs alert workers to the fact that they must have the appropriate authorization from their supervisor to enter the regulated area. This is especially important when regulated areas are established on a temporary basis, such as during cleanup operations. In such cases, workers who typically work in or travel through the area may not be aware of the new potential for exposures to beryllium and, thus, may not be appropriately equipped for or aware of the need to protect themselves from potential exposures. Warning signs also serve as a constant reminder to those who work in regulated areas that the potential for exposure to beryllium exists in the area and that appropriate controls must be used.

Sections 850.38(b)(1) requires responsible employers to label with appropriate hazard warnings all containers of beryllium, beryllium compounds, or beryllium-contaminated clothing, equipment, waste, scrap, or debris to ensure that individuals who come in contact with the containers are aware of their contents and the need to implement special handling precautions. Because the effectiveness of the warning labels in achieving these objectives is greatly dependent upon the visibility, accuracy, and understandability of the content of the labels, section 850.38(b)(2) further specifies that labels bear the following information:

DANGER
CONTAMINATED WITH BERYLLIUM
DO NOT REMOVE DUST BY BLOWING OR SHAKING
CANCER AND LUNG DISEASE HAZARD

Section 850.38(c) clarifies that the warning signs and labels developed to comply with the CBDPP must also comply with the OSHA Hazard Communication standard, 29 CFR 1910.1200. DOE believes this clarification is needed to avoid duplication of effort. In addition, DOE believes that ensuring that the content and format of warning signs and labels comply with the Hazard Communication standard will result in a consistent, recognizable, and comprehensive approach to alerting workers to beryllium's potential to cause disease.

One commenter (Ex. 20) asked if DOE had given consideration to requiring that warning signs and labels be provided in languages other than English or the use of universal symbols to communicate information. DOE notes that 29 CFR 1910.1200(f)(9) (OSHA's Hazard Communication standard) states that employers with employees who speak other languages may present the information in those other languages, as long as the information is presented in English as well. DOE agrees with this approach. Thus, section 850.38(c) requires that all warning signs and labels comply with 29 CFR 1910.1200.

Another commenter (Ex. 23) noted that the warning signs provisions specified in the NOPR differed slightly from those in DOE Notice 440.1, and suggested that DOE retain the NOPR language in the final rule in lieu of the language in the Interim CBDPP. DOE notes that the warning signs and labels provisions of the NOPR were based on the provisions of the Interim CBDPP, with minor modifications added to clarify the intent of the requirements. DOE has retained these clarifications in section 850.38 of the final rule.

A third commenter (Ex. 9) was concerned that references to cancer and cancer hazards in warning signs and labels may be misleading and deceptive, and, noting that the reference did not represent the opinion of a qualified medical professional, recommended that DOE obtain a "qualified medical opinion" to resolve this issue. DOE believes that the action of the International Agency for Research on Cancer (IARC) and ACGIH in classifying beryllium as a human carcinogen provides sufficient basis for retaining the cancer warning on warning signs and labels for beryllium-contaminated materials. DOE further notes that NIOSH has classified beryllium as a potential occupational carcinogen since 1977.

Section 850.39—Recordkeeping and Use of Information

Section 850.39 (proposed as section 850.38) requires responsible employers to establish and effectively manage records that relate to the CBDPP and to periodically submit to the Office of Environment, Safety and Health a registry of beryllium-associated workers.

Section 850.39(a) requires the responsible employer to establish and maintain up-to-date and accurate records of all beryllium inventory information, hazard assessments, exposure measurements, exposure controls, and medical surveillance data. DOE believes that up-to-date and accurate records are essential for effectively implementing the CBDPP, assessing its adequacy, and studying the relationship between workplace conditions and CBD. Some of these records will be needed to implement the

performance feedback provisions in section 850.40.

One commenter (Ex. 31) recommended that the final rule explicitly reference OSHA's regulations at 29 CFR 1910.1200 and CFR 1910.1020. OSHA regulations at 29 CFR 1910.1200 (Hazard Communication) already require employers to keep records of beryllium inventory information, and regulations at 29 CFR 1910.20 (Access to Employee Exposure and Medical Records) already require employers to keep records of beryllium hazard assessments, exposure measurements, and medical surveillance data. DOE has not, however, included in section 850.39 references to these OSHA standards. DOE believes that this rule's requirements for maintaining and transferring CBDPP-related records, while ensuring confidentiality of personal information, are stated in clear and concise wording specifically related to the CBDPP that is preferable to cross-referenced OSHA standards. Furthermore, one commenter's (Ex. 31) primary concern was ensuring that workers have access to the information that relates to their personal exposure and medical status. DOE has addressed this concern in section 850.24(g), by requiring responsible employers to notify affected workers of beryllium monitoring results, and in section 850.34(d)(2), by requiring the SOMD to provide to workers the results of medical tests and procedures.

DOE encourages responsible employers to take advantage of existing recordkeeping systems to minimize the burden of implementing section 850.39. Responsible employers also may find that records that are generated outside the CBDPP may be useful in implementing the CBDPP. Examples are records of beryllium training, personnel demographics, beryllium mission descriptions, and payroll records of projects that can be used to link workers with potential beryllium exposure.

Section 850.39(b) requires Heads of DOE Departmental Elements to designate all record series required to be generated under this rule as federal records and, therefore, subject to all applicable federal records management and access laws.

One commenter (Ex. 18), in commenting on the baseline inventory provisions of the proposed rule, recommended that DOE require full public disclosure of health and safety documents related to past beryllium emissions and exposures. In the final rule, DOE is requiring Heads of DOE Departmental Elements to designate the CBDPP-required records as federal records. Federal records, except for records containing specific types of sensitive information, are available to the public under the Freedom of Information Act (FOIA) and related federal policy. The FOIA requires the federal government to release government records upon request, except for information that is exempted from disclosure to protect an overriding interest, such as privacy, national security, and trade secrets and other confidential business information. The FOIA exemption for information in personnel and medical files (5 U.S.C. 552(b)(6)) is especially important for DOE CBDPP-required records, because many of these records contain medical information that is protected from release by this FOIA provision and other federal laws.

One commenter (Ex. 21) recommended that DOE address the retention of records in this rule. DOE has added to section 850.39(b) the requirement that Heads of DOE Departmental Elements ensure that the record series generated as required under this rule are retained for at least 75 years, which is consistent with DOE's policy on retaining medical records. This requirement will ensure that required CBDPP records that relate to workplace conditions will be available in the future to correlate with the beryllium-associated workers' medical records. Heads of DOE Departmental elements will be able to ensure that they can comply with section 850.39(b) if the CBDPP-required records generated by DOE responsible employer contractors are identified in the relevant contracts as DOE-owned documents. Therefore, DOE expects that Heads of DOE Departmental elements will direct their DOE contract officers to stipulate DOE ownership of these documents in those contracts.

The same commenter recommended that DOE address the transfer of records to successive responsible employers. DOE agrees that this information should be covered in the rule, and has added section 850.39(c) to require responsible employers to convey to DOE, or its designee, all record series generated under this rule if the responsible employer ceases to be involved in the CBDPP (e.g., ceases to be a DOE contractor).

Section 850.39(d) requires that responsible employers create links between data sets on workplace conditions and health outcomes to serve as a basis for understanding the beryllium health risk. This linkage of data will assist DOE and responsible employers in identifying unsafe work practices and understanding the relationship between workplace conditions and CBD.

Section 850.39(e) requires the responsible employer to ensure the confidentiality of all records containing personal, private information that are generated as required by this rule. Protecting the confidentiality of these records is required by the Americans with Disabilities Act (42 U.S.C. 12112(d)(4)), the Privacy Act (5 U.S.C. 552a) and other applicable laws. In addition, DOE recognizes that many beryllium-associated workers will participate in some of the voluntary components of the CBDPP only if they believe that their personal information will be kept confidential.

Section 850.39(e)(1) explicitly requires responsible employers to ensure that all records that are transmitted to other parties do not contain names, social security numbers or any other variables, or combination of variables, that could be used to identify individuals. DOE recognizes that responsible employers must take these precautions to prevent the violation of confidentiality laws because personal information could be obtained from transmitted records, or inferred from information other than personal identifiers in the records, unless these precautions are taken.

One commenter (Ex. 4) stated that the rule's confidentiality requirements could prevent industrial hygienists from obtaining the health outcome information that is necessary to perform the linkage of site workplace conditions and health outcomes required by section 850.39(d). DOE does not intend health outcome information that would compromise confidentiality to be provided to industrial hygienists. DOE believes that the linkage required by section 850.39(d) could be performed after personal identifiers are removed from the health outcome information, making it consistent with section 850.39(e)(1).

Another commenter (Ex. 16) recommended that the final rule require the responsible employer to place beryllium medical records in the custody of a medical director, as opposed to the proposed requirement that medical records be held by the responsible employer. DOE recognizes that beryllium medical records may be in the custody of physicians involved in CBD studies other than the SOMD. DOE responds to this commenter's (Ex. 16) concern in section 850.39(e)(2)(i) by requiring responsible employers to ensure that individual medical information generated by the CBDPP is either included as part of the worker's site medical records and maintained by

the SOMD, or is maintained by another physician designated by the responsible employer.

Section 850.39(e)(2)(ii) (proposed section 850.38(d)) retains the proposed requirement that responsible employers ensure that individual medical information generated by the CBDPP is maintained separately from other records. A commenter (Ex. 19) recommended that the rule require responsible employers to use only one data system, maintained by the SOMD, to facilitate the analysis of the data and to increase workers' confidence in the confidentiality of SOMD-maintained records. DOE retained this requirement, however, because the separation of medical and other records is good file management. Further, the Americans with Disabilities Act (42 U.S.C. 12112(d)(4)(C)) requires such separation for privately-owned medical information. DOE recognizes that analysis of the data may be somewhat more difficult with separately maintained medical records, but separation of these records is required by law. There also are practical reasons to require the separation of these records. Personnel officials would require authorization from medical directors before accessing personnel records that were stored with medical records. At the same time, the medical directors would need a system to ensure that no confidential medical information was mixed in with the personnel records that personnel officials accessed. Employers eliminate these administrative burdens by maintaining separate medical and personnel records.

Section 850.39(f) requires the responsible employer to maintain all records required by this part in current and accessible electronic form to permit ready retrieval of data in a format that maintains confidentiality. This requirement is necessary to facilitate timely, efficient, and cost-effective transfer and analysis of CBDPP-related data. DOE has added the phrase "in current and accessible" to this section because DOE's experience indicates that the ability to use information held in electronic records is severely hampered if the electronic systems are out-of-date or the records are difficult to obtain. Similarly, DOE has added the phrase "that maintains confidentiality" to this section because DOE's experience indicates that transferring information while maintaining confidentiality cannot practically be accomplished using systems that must be modified, converted, or replaced before the transfer can occur.

A commenter (Ex. 21) recommended that the final rule require responsible employer contractors to use the same record retrieval identifiers that any predecessor contractor used. This would allow current contractors easily to link their data to the predecessor contractors' data on the same subject. DOE agrees that successive contractor's use of the same record retrieval identifiers would make exposure-health outcome and epidemiology studies easier to conduct. Therefore, DOE encourages successor contractors to use the same record retrieval identifiers as the predecessor contractor. DOE has not, however, made this a requirement in the final rule because it would be inconsistent with DOE's commitment to a performance-based rule to mandate this practice. DOE's goal in developing this rule is to allow the responsible employer maximum flexibility by specifying in the final rule only those record system characteristics and practices that DOE believes are essential for achieving successful CBDPPs.

Section 850.39(g) requires the responsible employer to transmit all records required by this rule, in a format that protects the confidentiality of individuals, to the DOE Assistant Secretary for Environment, Safety and Health on request. DOE replaced "Headquarters" in the proposed rule with "Assistant Secretary for Environment, Safety and Health" in the final rule to clarify that DOE's Office of Environment, Safety and Health is the DOE organization that is responsible for conducting occupational health studies that involve DOE workers.

Section 850.39(h) requires the responsible employer semi-annually to transmit to the DOE Office of Epidemiologic Studies, Office of Environment, Safety and Health, an electronic registry of beryllium-associated workers. The transmitted registry must protect confidentiality and include (but is not limited to) the following information for each worker in the registry: a unique identifier, date of birth, gender, site, job history, medical screening test results, exposure measurements, and results of referrals for specialized medical evaluations. DOE's collection of this information conforms to DOE Record System 88, "Epidemiologic and Other Studies, Surveys, and Surveillance," established as required by the Privacy Act. The Office of Epidemiologic Surveillance is responsible for administrative and policy decisions related to the beryllium registry and provides technical support to the SOMD.

The medical records generated by the CBDPP will be kept in appropriate agency Privacy Act systems of records, such as DOE–33, "Personnel Medical Records," and/or DOE–88, and will be afforded the protection provided by the Privacy Act. Should the agency receive a request for these records, it will use every argument legally and reasonably available to it, including the authority granted under the FOIA and the Privacy Act and the agency's regulations implementing those statutes, to protect the privacy of individuals in the records generated by the CBDPP. DOE's policy expressed in 10 CFR 1004.3(e)(ii), to maximize public disclosure of records that pertain to concerns about the environment, public health or safety, or employee grievances, has never been applied to jeopardize the privacy interests of individuals in their medical records and will not be applied to jeopardize privacy interests in records generated by the CBDPP.

Section 850.39(h) includes "exposure measurements" in the registry as recommended by a commenter (Ex. 14). DOE had inadvertently omitted exposure measurements in the proposed registry provision. Also, section 850.39(h) includes beryllium-associated workers as recommended by a commenter (Ex. 28), rather than the narrower category of beryllium workers as proposed. DOE accepts this recommended change because it recognizes that some DOE workers who currently do not perform tasks involving beryllium are nonetheless at risk of contracting CBD (based on past potential exposure to beryllium) and must be included to complete the registry.

DOE proposed including beryllium-associated workers' names and social security numbers in the data that would be included in the beryllium registry. Several commenters (Exs. 16, 23, 28) argued that including the names and social security numbers of the beryllium-associated workers in the registry would compromise their privacy. DOE has responded to these commenters' concerns by replacing the proposed "names" and "social security numbers" with "unique identifier." The term "unique identifier" is defined in section 850.3(a) to mean the part of a paired set of labels, used in records that contain confidential information, that does not identify individuals except by using the matching label. Only the SOMD will have the key to match the unique identifier to the individual. This approach allows health and safety professionals and researchers to access the registry data and allows the SOMD to inform individuals of relevant study results, while maintaining confidentiality at all times.

The beryllium registry will serve as a repository for information on beryllium-associated workers. DOE will use the registry to determine the exposure profile and disease status of beryllium-associated workers, and provide feedback to the responsible employer on the effectiveness of the CBDPP. The registry will give DOE the ability to combine data from different facilities and perform analyses that are impossible to perform with the small amount of data that is available from each individual facility. The combined data may help DOE identify risk factors for CBD and evaluate the predictive value of medical tests such as the Be-LPT. Also, researchers may use the registry to conduct further epidemiological studies to better understand the cause and development of CBD and better identify those at risk.

One commenter (Ex. 26) recommended that DOE delete the beryllium registry from the final rule because the commenter believes that: (1) DOE has not adequately described the research for which it will be used, and (2) implementing the registry will be costly. This commenter suggested, as an alternative, that DOE retain the beryllium registry, but include in the rule the specific research protocol that would be used. DOE does not agree with the commenter. DOE is confident that the registry as provided in the final rule will support the studies needed to better understand the relationship between workplace conditions and CBD. This knowledge should provide the basis for improved worker protections. DOE also thinks that the expense of the registry is well justified by these benefits. DOE also disagrees with the recommended alternative of including the research protocols in this rule. Stipulating research protocols in regulations that could only be changed through notice-and-comment rulemaking could stifle research activities.

One commenter (Ex. 19) expressed the concern that DOE's Office of Environment, Safety, and Health use of the beryllium registry could overshadow important site-specific studies. DOE believes that studies at both the site and national level are important for understanding the relationship between workplace conditions and CBD. DOE has included section 850.39(d), which requires responsible employers to link data on workplace conditions and health outcomes, in part to facilitate the site level studies. The beryllium registry established by section 850.39(h) will be used by the Office of Epidemiologic Surveillance to support national level studies.

Two commenters (Exs. 19, 23) recommended that the rule require that a university or a university with input from an oversight board, or other suitably qualified organizations design the epidemiological analysis of the CBDPP-generated data. Although responsible employers and DOE's Office of Environment, Safety and Health may use universities or other suitably qualified organizations to design these analyses, DOE thinks it would be inappropriate to specify the use of such organizations in the rule. This recommendation is not adopted.

Section 850.40—Performance Feedback

The final rule requirements for performance feedback in section 850.40 are essentially the same as those proposed. Section 850.40(a) requires that responsible employers conduct periodic analysis and assessment of monitoring results, hazards identified, medical surveillance results, attainment of exposure reduction and minimization goals, and occurrence reporting data. DOE believes that the analysis of these data is important for the continuous improvement of the program.

To ensure that all workers have the information needed to safely perform their assigned tasks, section 850.40(b) requires that results of performance assessments conducted in accordance with this rule be provided to line managers, planners, worker protection staff, workers, medical staff, and others.

LIST OF COMMENTERS

Exhibit No.	Company/Organization
1	Atomic Weapons Establishment (AWE)
2	Oak Ridge Institute for Science and Education (ORISE)
3	U.S. Department of Navy, Navy Environmental Health Center
4	Fluor Daniel Hanford, Incorporated
5	Burlin McKinney
6	Idaho National Engineering and Environmental Laboratory (INEEL), Operated by Lockheed Martin
7	Freddy D. Marler Jr.
8	Alfred Glenn Bell
9	Lockheed Martin Idaho Technologies Company, INEEL
10	A Concerned American Citizen
11	Robert A. Gadon, CIH
12	Daniel R. Roberts, Danny Bush, Willie James Brooks, C.E. Tilley, Robert Lang Freels, Edna & Ernest Hugart, Victoria L. O'Sheel, Kenneth L. Moore, Cheryll A. Dyer, James M. Harvey, J. R. Miller, Luis Revilla, Connie Willis, Bruce Lawson, Lynn & Linda Cox, Roy & Debra Jones
13	American Industrial Hygiene Association (AIHA)
14	Gary Foster
15	Darrell Lawson
16	University of California, Laboratory Administration
17	Hanford Environmental Health Foundation
18	Serious Texans Against Nuclear Dumping (STAND), Incorporated
19	American College of Occupational and Environmental Medicine
20	Occupational Safety and Health Administration (OSHA)
21	University of Cincinnati Medical Center
22	Paper, Allied Industrial Chemical & Energy Workers Union (PACE)
23	Kaiser-Hill Company, Rocky Flats Environmental Technology Site
24	Lockheed Martin Energy Systems, Incorporated, (Y–12 Facility)
25	Lockheed Martin Energy Research Corporation (Oak Ridge Laboratory)
26	Brush Wellman, Incorporated
27	James Turner
28	National Jewish Medical and Research Center
29	National Institute for Occupational Safety and Health (NIOSH)
30	Consortium for Risk Evaluation with Stakeholder Participation (CRESP)
31	International Chemical Workers Union Council of the United Food and Commercial Workers International Union (ICWUC/UFCW)
32	Concerned Citizens for Nuclear Safety (CCNS)
33	Stanford Linear Accelerator Center (SLAC)
34	Fermi National Accelerator Laboratory (Fermi Lab)
35	United Steelworkers, Local 8031
36	U.S. House of Representatives, Van Hilleary
37	National Institute for Occupational Safety and Health (NIOSH)
38	Atomic Weapons Establishment (AWE)
38	Commodore Advance Science, Incorporated
40	Hanford Environmental Health Foundation
41	Oak Ridge National Laboratory
42	Argonne National Laboratory
43	Fluor Daniel Hanford, Incorporated
44	University of Cincinnati Medical Center
45	Gary Foster
46	Pantex Plant
47	Kaiser-Hill, Rocky Flats Environmental Technology Site
48	Paper, Allied Industrial Chemical & Energy Workers Union (PACE)
49	Consortium for Risk Evaluation with Stakeholder Participation (CRESP)
50	Brush Wellman, Incorporated
51	University of Cincinnati

LIST OF COMMENTERS—Continued

Exhibit No.	Company/Organization
52	Building & Construction Trades Department, AFL–CIO

V. Procedural Requirements

A. Review Under Executive Order 12866

This rulemaking has been determined to be a significant regulatory action under Executive Order 12866, "Regulatory Planning and Review," 58 FR 51735 (October 4, 1993). Accordingly, today's action was subject to review under the executive order by the Office of Information and Regulatory Affairs (OIRA). The assessment of the potential costs and benefits of the proposed rule, which was made available to the public when the NOPR was published in the **Federal Register**, was updated to reflect changes made in the final rule.

Before conducting the assessment, DOE profiled the sites and activities that will be affected by the CBDPP rule and estimated the number of workers that will be affected by the rule. DOE estimates that 1,634 workers may be exposed or potentially exposed to airborne concentrations of beryllium in the DOE complex. Furthermore, DOE estimates that 1,236 of these workers (75.6 percent) are potentially exposed above the action level or the PEL prescribed in the CBDPP rule.

DOE began the cost estimation by reviewing the rule to determine which requirements of the rule will impose costs on affected entities. DOE then determined the controls (e.g., implementation of procedures, purchase of equipment) necessary for affected entities to be in compliance with each requirement. DOE's assessment refers to these determinations as compliance profiles. Since the goal of the compliance cost estimation is to determine the incremental costs of compliance (OMB Guidance, 1996), the compliance profiles were compared to the procedures and controls that are currently in place at DOE facilities affected by the rule (i.e., the baseline). Procedures and controls required by the CBDPP rule that are not currently in place at DOE facilities were considered new to the facilities, and thus would impose incremental costs on the affected entities. The compliance profiles were then adjusted to reflect only the required incremental controls.

The next step in DOE's assessment was to estimate the costs for each compliance profile. DOE collected data on the cost of each element contained in the compliance profiles. The profiles are designed to reflect the full opportunity cost of compliance. For example, the compliance profile for performing a Be-LPT test includes not only the test itself, but also the labor time for the worker and physician to conduct the test, shipping the sample to a lab, and analyzing and interpreting the results of the test. The cost data was obtained from a variety of sources, including CBDPP plans submitted under DOE Notice 440.1, a 1999 Environment, Safety and Health (EH) Cost Survey, contact with DOE facilities subject to the CBDPP rule, trade publications, the U.S. Office of Personnel Management (OPM) (e.g., for wage rates), and previous economic analyses of other regulations (e.g., regulatory impact analyses of OSHA health standards). This cost data was then applied to the compliance profiles to determine the costs associated with each profile, providing an estimate of the incremental cost for each requirement.

DOE-wide cost estimates for each requirement were generated by multiplying the number of units affected by each requirement by the incremental cost for each requirement. Costs estimated in this step were then annualized using a discount rate. Discount rates are used to translate costs (and benefits) that are incurred in future years into a present value. Following OMB Guidance (1992), DOE chose a 7 percent discount rate. In the analysis, DOE uses the 7 percent discount rate for three purposes: (1) To annualize the costs of equipment or other program elements that have a lifetime of more than one year, (2) to translate the costs incurred in future years into a present value, and (3) to calculate the annualized cost of initial requirements of DOE N 440.1 and the CBDPP rule.

DOE estimated the total compliance costs of the CBDPP, including the costs of the interim CBDPP under DOE Notice 440.1 and the costs of this final rule. DOE estimates an $8.54 million annualized cost on DOE contractors between July 1997 and December 1999 (compliance with DOE Notice 440.1) and a $31.55 million annualized cost on DOE contractors between December 1999 (the assumed effective date of the final rule) and December 2009. This includes an initial (i.e., startup) cost of $9.02 million incurred in July 1997 and another initial cost of $2.22 million incurred in December 1999.

DOE also assessed the potential benefits of the CBDPP for DOE, DOE contractors, and workers. DOE assessed the following benefits of the CBDPP rule: (1) Reduced medical costs; (2) reduced mortality; (3) increased quality of life; (4) increased medical surveillance for workers at risk; (5) increased work-life for beryllium workers; (6) increased productivity; (7) reduced legal costs for DOE and DOE contractors; and (8) a reduction in the externality associated with beryllium exposure through a transfer of the medical costs from workers to DOE contractors. Because sufficient information on the dose-response relationship for beryllium is not available within the scientific community, DOE could not relate reduced levels of exposure to a specific reduction in CBD and beryllium sensitization. Nevertheless, DOE estimates that the monetary benefits from reduced lifetime medical costs could range from $10,100 to $16,093 for each avoided case of beryllium sensitization or CBD.

DOE also assessed the potential economic impacts of the rule on the provision of public goods that contain beryllium and the impact on the market for beryllium. DOE assessed each of these potential impacts and determined neither will impose a significant economic impact. DOE determined that the potential reduction in the provision of beryllium-containing public goods will be minimal and, consequently, the reduction in demand for beryllium will also be small.

DOE's assessment of the potential costs and benefits of the final has been placed in the rulemaking file (Docket Number EH–RM–98–BRYLM). DOE also has placed in the rulemaking file a document that identifies the substantive changes between the draft final rule submitted to the OIRA for review and the final rule published today, including identification of the changes suggested or recommended by OIRA. These documents may be reviewed and copied at the DOE of Information Reading Room, Room 1E–190, 1000 Independence Avenue, SW, Washington, DC 20585, between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act, 5 U.S.C. 601–612, requires that an agency prepare a regulatory flexibility analysis and publish it at the time of publication of general notice of proposed rulemaking for the rule. This requirement does not apply if the agency certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities (5 U.S.C. 605(b)).

Today's action establishes DOE's regulations for a CBDPP to reduce the number of DOE Federal and contractor workers exposed to beryllium, minimize the levels of and potential for exposure to beryllium, and establish medical surveillance requirements to ensure early detection of disease. The contractors who manage and operate DOE facilities are principally responsible for implementing the CBDPP. DOE has considered whether these contractors are "small businesses," as that term is defined by the Regulatory Flexibility Act (5 U.S.C. 601(3)). The Regulatory Flexibility Act's definition incorporates the definition of "small business concern" in the Small Business Act, which the Small Business Administration (SBA) has developed through size standards in 13 CFR part 121. Small businesses are business concerns which, together with their affiliates, have no more than 500 to 1500 employees, varying by SIC category, and annual receipts of between $0.5 million to $25 million, again varying by SIC category. The DOE contractors subject to the CBDPP requirements exceed the SBA's size standards for small businesses. In addition, DOE contractors are reimbursed through their contracts with DOE for the costs of complying with DOE health and safety program requirements. They will not, therefore, be adversely impacted by the requirements in the rule. For these reasons, DOE certifies that the final rule will not have a significant economic impact on a substantial number of small entities.

C. Review Under the Paperwork Reduction Act

DOE submitted the proposed collections of information in this rule to the Office of Management and Budget for review under section 3507(d) of the Paperwork Reduction Act of 1995 (42 U.S.C. 3507(d)). The information that DOE contractors are required to produce, maintain and report is necessary to permit the Department to manage and oversee the health and safety programs that control worker exposure to beryllium. The Office of Management and Budget has not yet approved the collections of information in this rule. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number (5 CFR 1320.5(b)).

D. Review Under the National Environmental Policy Act

DOE has reviewed the promulgation of 10 CFR Part 850 under the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), the Council on Environmental Quality regulations for implementing NEPA (40 CFR parts 1500–1508), and DOE's NEPA implementing procedures (10 CFR Part 1021). DOE has completed an Environmental Assessment, and on the basis of that assessment has determined that an environmental impact statement is not required and issued a Finding of No Significant Impact (FONSI) for this rule. In the Notice of Proposed Rulemaking, the Department announced the availability of the draft Environmental Assessment and requested comments on the Assessment. DOE did not receive any comments on the draft Environmental Assessment. The Environmental Assessment updates the draft Environmental Assessment (DOE/EA 1249) to reflect changes in the final rule made in response to public comments on the rule. The Environmental Assessment and FONSI are available for inspection at the DOE Freedom of Information Reading Room, 1E–190, 1000 Independence Avenue SW, Washington, DC 20585, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

E. Review Under Executive Order 13132

Executive Order 13132 (64 FR 43255, August 4, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have federalism implications. Agencies are required to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and carefully assess the necessity for such actions. DOE has examined today's rule and has determined that it does not preempt State law and does not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Section 3 of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (February 7, 1996), instructs each agency to adhere to certain requirements in promulgating new regulations. Executive agencies are required by section 3(a) to adhere to the following general requirements: (1) Eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; and (3) provide a clear legal standard for affected conduct rather than a general standard and promote simplification and burden reduction. With regard to the review required by section 3(a), section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in section 3(a) and section 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that this final rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires each federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in an agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million in any one year. It also requires a federal agency to develop an effective process to permit timely input by elected officers of State, local, and tribal governments on a proposed "significant Federal intergovernmental mandate," and requires an agency plan for giving notice and an opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. The final rule published today applies only to activities conducted by or for DOE, and its implementation will not result in an expenditure of $100 million in any year by State, local or tribal governments or the private sector. Therefore, the requirements of Title II Unfunded Mandates Reform Act of 1995 do not apply.

H. Review Under Small Business Regulatory Enforcement Fairness Act of 1996

As required by 5 U.S.C. 801, DOE will report to Congress promulgation of this rule prior to its effective date. The report will state that it has been

determined that the rule is not a "major rule" as defined by 5 U.S.C. 804(2).

Appendix A to the Preamble References

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Appendix B to the Preamble—Questions and Answers Concerning the Beryllium-Induced Lymphocyte Proliferation Test (Be-LPT), Medical Records, and the Department of Energy (DOE) Beryllium Registry

What Is the Be-LPT Blood Test?

In the Be-LPTs, disease-fighting blood cells that are normally found in the body, called lymphocytes, are examined in the laboratory and separated from your blood. Beryllium and other test agents are then added to small groups of these lymphocytes. If these lymphocytes react to the beryllium in a specific way, the test results are "positive." If they do not react to beryllium, the test is "negative."

Experts believe that the Be-LPT shows positive results in individuals who have become sensitive or allergic to beryllium. It is unclear what this sensitivity means. Studies have shown it to be an early sign of chronic beryllium disease (CBD) in many individuals. In others, sensitivity might simply mean that the person was exposed to beryllium and that his or her body has reacted. It might mean that an individual is more likely than others to get CBD. You are being offered the Be-LPT because doctors believe it is useful in detecting cases of CBD early or cases that might otherwise be missed or diagnosed as another type of lung problem. Once CBD is identified, doctors can determine the treatment that is needed to minimize the lung damage that CBD causes.

As in any other medical test, the Be-LPT sometimes fails or provides unclear results. The laboratory calls these results "uninterpretable." Even when the test appears successful, it may appear positive when a person is not sensitive or allergic to beryllium. This is called a "false positive" result. It is also

possible that the test will show "negative" results when a person is actually "sensitized" to beryllium. This is a "false negative" result. If you have a "uninterpretable" blood Be-LPT result, you will be asked to provide another blood sample so the test can be repeated. If you have "positive" results, you will be offered further medical tests to confirm or rule out CBD. Remember that you may refuse further tests at this point or at any point during your medical evaluations.

It is important for you to know that if the physical examination or the results from other tests you are receiving suggest that you have CBD, you may be offered further medical tests. These medical tests may be offered even if your Be-LPT is "negative."

Some individuals with confirmed "positive" Be-LPTs but no other signs of CBD have developed the disease. The likelihood of this happening will only be known after large groups of potentially exposed individuals have had their blood tested, have had further medical tests, and are studied for many years.

Do I Have To Have the Be-LPT Done?

No. Your participation in the medical surveillance program is strictly voluntary. You may refuse any of the tests offered to you, including the Be-LPT. If you change your mind, you are free to participate in the program at any time. Talking with your family, your doctor, or other people you trust may help you decide. The physicians in the clinic that provide the tests can also help answer any questions that you might have.

What Will Happen if I Decide To Have the Be-LPT Blood Test?

A small amount of your blood will be drawn from a vein in your arm and sent to a laboratory. There is little physical risk in drawing blood. Slight pain and bruising may occur in a few individuals. Rarely, the needle puncture will become infected. Other routine medical evaluation tests may be offered when you have the Be-LPTs including a physical examination, a chest X-ray, and breathing tests that help find signs of CBD, if they exist.

Other diseases may resemble CBD. Different medical tests can help a physician decide if a person has CBD or another disease. If the examining physician suspects that you have CBD, he or she will recommend additional medical tests to help confirm a diagnosis. Separate information regarding these additional medical tests will be given to you if they are recommended. Your consent will be requested when the extra tests are given. You can always refuse additional tests, if you so choose. Your employer will pay for all tests.

When Will I Receive the Results of My Be-LPT Blood Test?

It could take 2 to 4 weeks for you to receive a letter informing you of your test results. The test itself usually takes 8 days to perform. The testing laboratory reports results to the physician who examined you and he or she will notify you.

Could a Positive Be-LPT Blood Test Affect My Job Assignment?

Yes. If you have a positive Be-LPT or have been diagnosed with CBD, your employer may inform you that the SOMD has recommended that you be temporarily or permanently removed from working with beryllium. You will be given information and counseling to help you decide whether to accept medical removal. If you agree to medical removal, every effort will be made to offer you another job that you are qualified (or can be trained for in a short period) to perform and where the beryllium exposures will be as low as possible, but in no case above the action level.

If you are temporarily removed, you will maintain your total normal earnings, seniority, and other benefits until you are placed in another job for 1 year, whichever comes first. If you are permanently removed, you will maintain your total normal earnings, seniority, and other benefits until you are placed in another job or for 2 years, whichever comes first. If you become physically unable to continue working, you may be eligible for workers' compensation and other benefits.

Will I Lose Any Pay or Any Other Benefits by Having the Examination During Normal Working Hours?

No. Your examination will be scheduled during normal work hours. You will not be required to take leave to have the examination, nor will you lose pay or any other benefits.

What Will Happen to the Records of the Medical Examination Results?

The results of your Be-LPT and other screening tests will be made available to you and, with your consent, to your physician. The information also will become part of your medical record, which the clinic keeps.

The results of tests and examinations in your medical record will be available to the physicians and nurses in this clinic, and possibly to scientists conducting health studies. The test results in your medical records will be kept in specially secured files under the supervision of physicians and nurses in the clinic, separate from other personnel records. Your test results will be medically confidential data and will not be released to anyone other than those listed in the following, unless you provide written permission. The following groups will have direct access to this information:

1. Clinic staff members;
2. Medical specialists who will provide or arrange for additional medical treatment or tests, if necessary;
3. U.S. Department of Energy Beryllium Registry staff; and
4. The Centers for Disease Control and Prevention and the National Institute for Occupational Safety and Health officials may require direct access to records that identify you by name for health studies.

If information about you is used in reports or a published health study, your identity will be disguised. You will not be identified in any published report or presentation.

What Laws Protect Me if I Consent To Participate in the Blood Be-LPT Testing Program?

State medical and nursing licensing boards enforce codes of ethics that require doctors and nurses to keep medical information confidential. The Privacy Act prevents unauthorized access to your DOE records without your permission. The information in records kept by your employer must be handled in accordance with the Americans with Disabilities Act and the Privacy Act of 1974. The consent form you sign also provides additional protection.

Can My Privacy and the Confidentiality of My Medical Records Be Guaranteed?

No. Access to or release of records could be required under court order, or DOE directive, but it is unlikely. It would also be available as the Freedom of Information Act or Privacy Act provide, such as to Congress, to an individual upon a showing of compelling circumstances affecting the health and safety of an individual, etc. If you apply for another job or for insurance, you may be requested to release the records to a future employer or an insurance company. If, for medical reasons, it is recommended that you transfer to an area where you will not contact beryllium, and you elect to do so, the personnel department and your supervisor will be notified. They will not be told the specific results of your tests but, because of the restrictions, they may assume that your Be-LPT results were positive.

What Is the DOE Beryllium Registry?

Your health and the health of all workers is a major concern to DOE. There is a need to learn more about chronic beryllium disease and what causes some individuals to react more strongly than others do. A DOE beryllium registry has been established to collect and maintain information on workers who are exposed to beryllium. This registry is a tool that will be used in health studies to better understand the nature of the disease. With it we can measure the burden of health effects related to beryllium exposure. The registry will also be used to evaluate the effectiveness of exposure control programs.

In addition to information about your beryllium-related exposures, the results of beryllium sensitization testing and/or CBD status collected by your employer will be added to the registry. Your employer must treat this information as confidential medical information and can only use or disclose this information in conformance with the Privacy Act of 1974, the Americans with Disabilities Act, and other applicable laws. Your employer will establish a unique identifier for you that will be included in the registry instead of your personal identifying information (such as your name and social security number). The unique identifier will be used to inform your employer of any study results that you and your employer's Site Occupational Medical Director (SOMD) should know about. The SOMD will know to whom the unique identifier refers and will notify you of these results. At no time will your name or other personal identifying information be included in any report. The confidentiality of personal information in DOE records is protected under the Privacy Act of 1974.

List of Subjects in 10 CFR Part 850

Beryllium, Chronic beryllium disease, Hazardous substances, Lung diseases, Occupational safety and health, Reporting and recordkeeping requirements.

Issued in Washington, D.C., on November 24, 1999.

Bill Richardson,

Secretary of Energy.

For the reason set forth in the preamble, Title 10, Chapter III of the Code of Federal Regulations is amended by adding a new part 850 as set forth below.

PART 850—CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM

Subpart A—General Provisions

Sec.

850.1 Scope.
850.2 Applicability.
850.3 Definitions.
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Subpart B—Administrative Requirements

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850.20 Baseline beryllium inventory.
850.21 Hazard assessment.
850.22 Permissible exposure limit.
850.23 Action level.
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850.31 Release criteria.
850.32 Waste disposal.
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850.35 Medical removal.
850.36 Medical consent.
850.37 Training and counseling.
850.38 Warning signs and labels.
850.39 Recordkeeping and use of information.
850.40 Performance feedback.

Appendix A to Part 850—Chronic Beryllium Disease Prevention Program Informed Consent Form.

Authority: 42 U.S.C. 2201(i)(3), (p); 29 U.S.C. 668; E.O. 12196, 3 CFR 1981 comp., p. 145 as amended.

Subpart A—General Provisions

§ 850.1 Scope.

This part establishes a chronic beryllium disease prevention program (CBDPP) that supplements and is integrated into existing worker protection programs that are established for Department of Energy (DOE) employees and DOE contractor employees.

§ 850.2 Applicability.

(a) This part applies to:

(1) DOE offices responsible for operations or activities that involve present or past exposure, or the potential for exposure, to beryllium at DOE facilities;

(2) DOE contractors with operations or activities that involve present or past exposure, or the potential for exposure, to beryllium at DOE facilities; and

(3) Any current DOE employee, DOE contractor employee, or other worker at a DOE facility who is or was exposed or potentially exposed to beryllium at a DOE facility.

(b) This part does not apply to:

(1) Beryllium articles; and

(2) DOE laboratory operations that meet the definition of laboratory use of hazardous chemicals in 29 CFR 1910.1450, Occupational Exposure to Hazardous Chemical in Laboratories.

§ 850.3 Definitions.

(a) As used in this part:

Action level means the level of airborne concentration of beryllium established pursuant to section 850.23 of this part that, if met or exceeded, requires the implementation of worker protection provisions specified in that section.

Authorized person means any person required by work duties to be in a regulated area.

Beryllium means elemental beryllium and any insoluble beryllium compound or alloy containing 0.1 percent beryllium or greater that may be released as an airborne particulate.

Beryllium activity means an activity taken for, or by, DOE at a DOE facility that can expose workers to airborne beryllium, including but not limited to design, construction, operation, maintenance, or decommissioning, and which may involve one DOE facility or operation or a combination of facilities and operations.

Beryllium article means a manufactured item that is formed to a specific shape or design during manufacture, that has end-use functions that depend in whole or in part on its shape or design during end use, and that does not release beryllium or otherwise result in exposure to airborne concentrations of beryllium under normal conditions of use.

Beryllium-associated worker means a current worker who is or was exposed or potentially exposed to airborne concentrations of beryllium at a DOE facility, including:

(1) A beryllium worker;

(2) A current worker whose work history shows that the worker may have been exposed to airborne concentrations of beryllium at a DOE facility;

(3) A current worker who exhibits signs or symptoms of beryllium exposure; and

(4) A current worker who is receiving medical removal protection benefits.

Beryllium emergency means any occurrence such as, but not limited to, equipment failure, container rupture, or failure of control equipment or operations that results in an unexpected

and significant release of beryllium at a DOE facility.

Beryllium-induced lymphocyte proliferation test (Be-LPT) is an in vitro measure of the beryllium antigen-specific, cell-mediated immune response.

Beryllium worker means a current worker who is regularly employed in a DOE beryllium activity.

Breathing zone is defined as a hemisphere forward of the shoulders, centered on the mouth and nose, with a radius of 6 to 9 inches.

DOE means the U.S. Department of Energy.

DOE contractor means any entity under contract with DOE (or its subcontractor) that has responsibility for performing beryllium activities at DOE facilities.

DOE facility means any facility operated by or for DOE.

Head of DOE Field Element means an individual who is the manager or head of the DOE operations office or field office, or any official to whom the Head of DOE Field Element delegates his or her functions under this part.

High-efficiency particulate air (HEPA) filter means a filter capable of trapping and retaining at least 99.97 percent of 0.3 micrometer monodispersed particles.

Immune response refers to the series of cellular events by which the immune system reacts to challenge by an antigen.

Medical removal protection benefits means the employment rights established by section 850.35 of this part for beryllium-associated workers who voluntarily accept temporary or permanent medical removal from beryllium areas following a recommendation by the Site Occupational Medicine Director.

Operational area means an area where workers are routinely in the presence of beryllium as part of their work activity.

Regulated area means an area demarcated by the responsible employer in which the airborne concentration of beryllium exceeds, or can reasonably be expected to exceed, the action level.

Removable contamination means beryllium contamination that can be removed from surfaces by nondestructive means, such as casual contact, wiping, brushing or washing.

Responsible employer means:

(1) For DOE contractor employees, the DOE contractor office that is directly responsible for the safety and health of DOE contractor employees while performing a beryllium activity or other activity at a DOE facility; or

(2) For DOE employees, the DOE office that is directly responsible for the safety and health of DOE Federal employees while performing a beryllium activity or other activity at a DOE facility; and

(3) Any person acting directly or indirectly for such office with respect to terms and conditions of employment of beryllium-associated workers.

Site Occupational Medical Director (SOMD) means the physician responsible for the overall direction and operation of the site occupational medicine program.

Unique identifier means the part of a paired set of labels, used in records that contain confidential information, that does not identify individuals except by using the matching label.

Worker means a person who performs work for or on behalf of DOE, including a DOE employee, an independent contractor, a DOE contractor or subcontractor employee, or any other person who performs work at a DOE facility.

Worker exposure means the exposure of a worker to airborne beryllium that would occur if the worker were not using respiratory protective equipment.

(b) Terms undefined in this part that are defined in the Atomic Energy Act of 1954 shall have the same meaning as under that Act.

§ 850.4 Enforcement.

DOE may take appropriate steps under its contracts with DOE contractors to ensure compliance with this part. These steps include, but are not limited to, contract termination or reduction in fee.

§ 850.5 Dispute resolution.

(a) Subject to paragraphs (b) and (c) of this section, any worker who is adversely affected by an action taken, or failure to act, under this part may petition the Office of Hearings and Appeals for relief in accordance with 10 CFR part 1003, Subpart G.

(b) The Office of Hearings and Appeals may not accept a petition from a worker unless the worker requested the responsible employer to correct the violation, and the responsible employer refused or failed to take corrective action within a reasonable time.

(c) If the dispute relates to a term or condition of employment that is covered by a grievance-arbitration provision in a collective bargaining agreement, the worker must exhaust all applicable grievance-arbitration procedures before filing a petition for relief with the Office of Hearings and Appeals. A worker is deemed to have exhausted all applicable grievance-arbitration procedures if 150 days have passed since the filing of a grievance and a final decision on it has not been issued.

Subpart B—Administrative Requirements

§ 850.10 Development and approval of the CBDPP.

(a) *Preparation and submission of initial CBDPP to DOE.* (1) The responsible employer at a DOE facility must ensure that a CBDPP is prepared for the facility and submitted to the appropriate Head of DOE Field Element before beginning beryllium activities, but no later than April 6, 2000 of this part.

(2) If the CBDPP has separate sections addressing the activities of multiple contractors at the facility, the Head of DOE Field Element will designate a single DOE contractor to review and approve the sections prepared by other contractors, so that a single consolidated CBDPP for the facility is submitted to the Head of DOE Field Element for review and approval.

(b) *DOE review and approval.* The appropriate Head of DOE Field Element must review and approve the CBDPP.

(1) The initial CBDPP and any updates are deemed approved 90 days after submission if they are not specifically approved or rejected by DOE earlier.

(2) The responsible employer must furnish a copy of the approved CBDPP, upon request, to the DOE Assistant Secretary for Environment, Safety and Health or designee, DOE program offices, and affected workers or their designated representatives.

(c) *Update.* The responsible employer must submit an update of the CBDPP to the appropriate Head of DOE Field Element for review and approval whenever a significant change or significant addition to the CBDPP is made or a change in contractors occurs. The Head of DOE Field Element must review the CBDPP at least annually and, if necessary, require the responsible employer to update the CBDPP.

(d) *Labor Organizations.* If a responsible employer employs or supervises beryllium-associated workers who are represented for collective bargaining by a labor organization, the responsible employer must:

(1) Give the labor organization timely notice of the development and implementation of the CBDPP and any updates thereto; and

(2) Upon timely request, bargain concerning implementation of this part, consistent with the Federal labor laws.

§ 850.11 General CBDPP requirements.

(a) The CBDPP must specify the existing and planned operational tasks that are within the scope of the CBDPP. The CBDPP must augment and, to the

extent feasible, be integrated into the existing worker protection programs that cover activities at the facility.

(b) The detail, scope, and content of the CBDPP must be commensurate with the hazard of the activities performed, but in all cases the CBDPP must:

(1) Include formal plans and measures for maintaining exposures to beryllium at or below the permissible exposure level prescribed in § 850.22;

(2) Satisfy each requirement in subpart C of this part;

(3) Contain provisions for:

(i) Minimizing the number of workers exposed and potentially exposed to beryllium;

(ii) Minimizing the number of opportunities for workers to be exposed to beryllium;

(iii) Minimizing the disability and lost work time of workers due to chronic beryllium disease, beryllium sensitization and associated medical care; and

(iv) Setting specific exposure reduction and minimization goals that are appropriate for the beryllium activities covered by the CBDPP to further reduce exposure below the permissible exposure limit prescribed in § 850.22.

§ 850.12 Implementation.

(a) The responsible employer must manage and control beryllium exposures in all DOE beryllium activities consistent with the approved CBDPP.

(b) No person employed by DOE or a DOE contractor may take or cause any action inconsistent with the requirements of:

(1) This part,

(2) An approved CBDPP, and

(3) Any other Federal statute or regulation concerning the exposure of workers to beryllium at DOE facilities.

(c) No task involving potential exposure to airborne beryllium that is outside the scope of the existing CBDPP may be initiated until an update of the CBDPP is approved by the Head of DOE Field Element, except in an unexpected situation and, then, only upon approval of the Head of DOE Field Element.

(d) Nothing in this part precludes a responsible employer from taking any additional protective action that it determines to be necessary to protect the health and safety of workers.

(e) Nothing in this part affects the responsibilities of DOE officials under the Federal Employee Occupational Safety and Health Program (29 CFR part 1960) and related DOE directives.

§ 850.13 Compliance.

(a) The responsible employer must conduct activities in compliance with its CBDPP.

(b) The responsible employer must achieve compliance with all elements of its CBDPP no later than January 7, 2002.

(c) With respect to a particular beryllium activity, the contractor in charge of the activity is responsible for complying with this part. If no contractor is responsible for a beryllium activity, DOE must ensure implementation of, and compliance with, this part.

Subpart C—Specific Program Requirements

§ 850.20 Baseline beryllium inventory.

(a) The responsible employer must develop a baseline inventory of the locations of beryllium operations and other locations of potential beryllium contamination, and identify the workers exposed or potentially exposed to beryllium at those locations.

(b) In conducting the baseline inventory, the responsible employer must:

(1) Review current and historical records;

(2) Interview workers;

(3) Document the characteristics and locations of beryllium at the facility; and

(4) Conduct air, surface, and bulk sampling.

(c) The responsible employer must ensure that:

(1) The baseline beryllium inventory is managed by a qualified individual (e.g., a certified industrial hygienist); and

(2) The individuals assigned to this task have sufficient knowledge and experience to perform such activities properly.

§ 850.21 Hazard assessment.

(a) If the baseline inventory establishes the presence of beryllium, the responsible employer must conduct a beryllium hazard assessment that includes an analysis of existing conditions, exposure data, medical surveillance trends, and the exposure potential of planned activities. The exposure determinants, characteristics and exposure potential of activities must be prioritized so that the activities with the greatest risks of exposure are evaluated first.

(b) The responsible employer must ensure that:

(1) The hazard assessment is managed by a qualified individual (e.g., a certified industrial hygienist); and

(2) The individuals assigned to this task have sufficient knowledge and experience to perform such activities properly.

§ 850.22 Permissible exposure limit.

The responsible employer must assure that no worker is exposed to an airborne concentration of beryllium greater than the permissible exposure limit established in 29 CFR 1910.1000, as measured in the worker's breathing zone by personal monitoring, or a more stringent TWA PEL that may be promulgated by the Occupational Safety and Health Administration as a health standard.

§ 850.23 Action level.

(a) The responsible employer must include in its CBDPP an action level that is no greater than 0.2 $\mu g/m^3$, calculated as an 8-hour TWA exposure, as measured in the worker's breathing zone by personal monitoring.

(b) If an airborne concentration of beryllium is at or above the action level, the responsible employer must implement §§ 850.24(c) (periodic monitoring), 850.25 (exposure reduction and minimization), 850.26 (regulated areas), 850.27 (hygiene facilities and practices), 850.28 (respiratory protection), 850.29 (protective clothing and equipment), and 850.38 (warning signs) of this part.

§ 850.24 Exposure monitoring.

(a) *General.* The responsible employer must ensure that:

(1) Exposure monitoring is managed by a qualified individual (e.g., a certified industrial hygienist); and

(2) The individuals assigned to this task have sufficient industrial hygiene knowledge and experience to perform such activities properly.

(b) *Initial monitoring.* The responsible employer must perform initial monitoring in areas that may have airborne beryllium, as shown by the baseline inventory and hazard assessment. The responsible employer must apply statistically-based monitoring strategies to obtain a sufficient number of sample results to adequately characterize exposures, before reducing or terminating monitoring.

(1) The responsible employer must determine workers' 8-hour TWA exposure levels by conducting personal breathing zone sampling.

(2) Exposure monitoring results obtained within the 12 months preceding the effective date of this part may be used to satisfy this requirement if the measurements were made as provided in paragraph (b)(1) of this section.

(c) *Periodic exposure monitoring.* The responsible employer must conduct

periodic monitoring of workers who work in areas where airborne concentrations of beryllium are at or above the action level. The monitoring must be conducted in a manner and at a frequency necessary to represent workers' exposure, as specified in the CBDPP. This periodic exposure monitoring must be performed at least every 3 months (quarterly).

(d) *Additional exposure monitoring.* The responsible employer must perform additional monitoring if operations, maintenance or procedures change, or when the responsible employer has any reason to suspect such a change has occurred.

(e) *Accuracy of monitoring.* The responsible employer must use a method of monitoring and analysis that has an accuracy of not less than plus or minus 25 percent, with a confidence level of 95 percent, for airborne concentrations of beryllium at the action level.

(f) *Analysis.* The responsible employer must have all samples collected to satisfy the monitoring requirements of this part analyzed in a laboratory accredited for metals by the American Industrial Hygiene Association (AIHA) or a laboratory that demonstrates quality assurance for metals analysis that is equivalent to AIHA accreditation.

(g) *Notification of monitoring results.* (1) The responsible employer must, within 10 working days after receipt of any monitoring results, notify the affected workers of monitoring results in writing. This notification of monitoring results must be:

(i) Made personally to the affected worker; or

(ii) Posted in location(s) that is readily accessible to the affected worker, but in a manner that does not identify the individual to other workers.

(2) If the monitoring results indicate that a worker's exposure is at or above the action level, the responsible employer must include in the notice:

(i) A statement that the action level has been met or exceeded; and

(ii) A description of the corrective action being taken by the responsible employer to reduce the worker's exposure to below the action level, if practicable.

(3) If the monitoring results indicate that worker exposure is at or above the action level, the responsible employer must also notify DOE and the SOMD of these results within 10 working days after receipt.

§ 850. 25 Exposure reduction and minimization.

(a) The responsible employer must ensure that no worker is exposed above the exposure limit prescribed in § 850.22.

(b) The responsible employer must, in addition:

(1) Where exposure levels are at or above the action level, establish a formal exposure reduction and minimization program to reduce exposure levels to below the action level, if practicable. This program must be described in the responsible employer's CBDPP and must include:

(i) Annual goals for exposure reduction and minimization;

(ii) A rationale for and a strategy for meeting the goals;

(iii) Actions that will be taken to achieve the goals; and

(iv) A means of tracking progress towards meeting the goals or demonstrating that the goals have been met.

(2) Where exposure levels are below the action level, implement actions for reducing and minimizing exposures, if practicable. The responsible employer must include in the CBDPP a description of the steps to be taken for exposure reduction and minimization and a rationale for those steps.

(c) The responsible employer must implement exposure reduction and minimization actions using the conventional hierarchy of industrial hygiene controls (*i.e.*, engineering controls, administrative controls, and personal protective equipment in that order).

§ 850.26 Regulated areas.

(a) If airborne concentrations of beryllium in areas in DOE facilities are measured at or above the action level, the responsible employer must establish regulated areas for those areas.

(b) The responsible employer must demarcate regulated areas from the rest of the workplace in a manner that adequately alerts workers to the boundaries of such areas.

(c) The responsible employer must limit access to regulated areas to authorized persons.

(d) The responsible employer must keep records of all individuals who enter regulated areas. These records must include the name, date, time in and time out, and work activity.

§ 850.27 Hygiene facilities and practices.

(a) *General.* The responsible employer must assure that in areas where workers are exposed to beryllium at or above the action level, without regard to the use of respirators:

(1) Food or beverage and tobacco products are not used;

(2) Cosmetics are not applied, except in change rooms or areas and shower facilities required under paragraphs (b) and (c) of this section; and

(3) Beryllium workers are prevented from exiting areas that contain beryllium with contamination on their bodies or their personal clothing.

(b) *Change rooms or areas.* The responsible employer must provide clean change rooms or areas for beryllium workers who work in regulated areas.

(1) Separate facilities free of beryllium must be provided for beryllium workers to change into, and store, personal clothing, and clean protective clothing and equipment to prevent cross-contamination;

(2) The change rooms or areas that are used to remove beryllium-contaminated clothing and protective equipment must be maintained under negative pressure or located so as to minimize dispersion of beryllium into clean areas; and

(c) *Showers and handwashing facilities.* (1) The responsible employer must provide handwashing and shower facilities for beryllium workers who work in regulated areas.

(2) The responsible employer must assure that beryllium workers who work in regulated areas shower at the end of the work shift.

(d) *Lunchroom facilities.* (1) The responsible employer must provide lunchroom facilities that are readily accessible to beryllium workers, and ensure that tables for eating are free of beryllium, and that no worker in a lunchroom facility is exposed at any time to beryllium at or above the action level.

(2) The responsible employer must assure that beryllium workers do not enter lunchroom facilities with protective work clothing or equipment unless the surface beryllium has been removed from clothing and equipment by HEPA vacuuming or other method that removes beryllium without dispersing it.

(e) The change rooms or areas, shower and handwashing facilities, and lunchroom facilities must comply with 29 CFR 1910.141, Sanitation.

§ 850.28 Respiratory protection.

(a) The responsible employer must establish a respiratory protection program that complies with the respiratory protection program requirements of 29 CFR 1910.134, Respiratory Protection.

(b) The responsible employer must provide respirators to, and ensure that they are used by, all workers who:

(1) Are exposed to an airborne concentration of beryllium at or above the action level, or

(2) Are performing tasks for which analyses indicate the potential for exposures at or above the action level.

(c) The responsible employer must include in the respiratory protection program any beryllium-associated worker who requests to use a respirator for protection against airborne beryllium, regardless of measured exposure levels.

(d) The responsible employer must select for use by workers:

(1) Respirators approved by the National Institute for Occupational Safety and Health (NIOSH) if NIOSH-approved respirators exist for a specific DOE task; or

(2) Respirators that DOE has accepted under the DOE Respiratory Protection Acceptance Program if NIOSH-approved respirators do not exist for specific DOE tasks.

§ 850.29 Protective clothing and equipment.

(a) The responsible employer must provide protective clothing and equipment to beryllium workers and ensure its appropriate use and maintenance, where dispersible forms of beryllium may contact worker's skin, enter openings in workers' skin, or contact workers' eyes, including where:

(1) Exposure monitoring has established that airborne concentrations of beryllium are at or above the action level;

(2) Surface contamination levels measured or presumed prior to initiating work are above the level prescribed in § 850.30;

(3) Surface contamination levels results obtained to confirm housekeeping efforts are above the level prescribed in § 850.30; and

(4) Any beryllium-associated worker who requests the use of protective clothing and equipment for protection against airborne beryllium, regardless of measured exposure levels.

(b) The responsible employer must comply with 29 CFR 1910.132, Personal Protective Equipment General Requirements, when workers use personal protective clothing and equipment.

(c) The responsible employer must establish procedures for donning, doffing, handling, and storing protective clothing and equipment that:

(1) Prevent beryllium workers from exiting areas that contain beryllium with contamination on their bodies or their personal clothing; and

(2) Include beryllium workers exchanging their personal clothing for full-body protective clothing and footwear before they begin work in regulated areas.

(d) The responsible employer must ensure that no worker removes beryllium-contaminated protective clothing and equipment from areas that contain beryllium, except for workers authorized to launder, clean, maintain, or dispose of the clothing and equipment.

(e) The responsible employer must prohibit the removal of beryllium from protective clothing and equipment by blowing, shaking, or other means that may disperse beryllium into the air.

(f) The responsible employer must ensure that protective clothing and equipment is cleaned, laundered, repaired, or replaced as needed to maintain effectiveness. The responsible employer must:

(1) Ensure that beryllium-contaminated protective clothing and equipment, when removed for laundering, cleaning, maintenance, or disposal, is placed in containers that prevent the dispersion of beryllium dust and that are labeled in accordance with § 850.38 of this part; and

(2) Inform organizations that launder or clean DOE beryllium-contaminated protective clothing or equipment that exposure to beryllium is potentially harmful, and that clothing and equipment should be laundered or cleaned in a manner prescribed by the responsible employer to prevent the release of airborne beryllium.

§ 850.30 Housekeeping.

(a) Where beryllium is present in operational areas of DOE facilities, the responsible employer must conduct routine surface sampling to determine housekeeping conditions. Surfaces contaminated with beryllium dusts and waste must not exceed a removable contamination level of 3 μg/100 cm^2 during non-operational periods. This sampling would not include the interior of installed closed systems such as enclosures, glove boxes, chambers, or ventilation systems.

(b) When cleaning floors and surfaces in areas where beryllium is present at DOE facilities, the responsible employer must clean beryllium-contaminated floors and surfaces using a wet method, vacuuming or other cleaning methods, such as sticky tack cloths, that avoid the production of airborne dust. Compressed air or dry methods must not be used for such cleaning.

(c) The responsible employer must equip the portable or mobile vacuum units that are used to clean beryllium-contaminated areas with HEPA filters, and change the filters as often as needed to maintain their capture efficiency.

(d) The responsible employer must ensure that the cleaning equipment that is used to clean beryllium-contaminated surfaces is labeled, controlled, and not used for non-hazardous materials.

§ 850.31 Release criteria.

(a) The responsible employer must clean beryllium-contaminated equipment and other items to the lowest contamination level practicable, but not to exceed the levels established in paragraphs (b) and (c) of this section, and label the equipment or other items, before releasing them to the general public or a DOE facility for non-beryllium use, or to another facility for work involving beryllium.

(b) Before releasing beryllium-contaminated equipment or other items to the general public or for use in a non-beryllium area of a DOE facility, the responsible employer must ensure that:

(1) The removable contamination level of equipment or item surfaces does not exceed the higher of 0.2 μg/100 cm^2 or the concentration level of beryllium in soil at the point or release, whichever is greater;

(2) The equipment or item is labeled in accordance with § 850.38(b); and

(3) The release is conditioned on the recipient's commitment to implement controls that will prevent foreseeable beryllium exposure, considering the nature of the equipment or item and its future use and the nature of the beryllium contamination.

(c) Before releasing beryllium-contaminated equipment or other items to another facility performing work with beryllium, the responsible employer must ensure that:

(1) The removable contamination level of equipment or item surfaces does not exceed 3 μg/100 cm^2;

(2) The equipment or item is labeled in accordance with § 850.38(b); and

(3) The equipment or item is enclosed or placed in sealed, impermeable bags or containers to prevent the release of beryllium dust during handling and transportation.

§ 850.32 Waste disposal.

(a) The responsible employer must control the generation of beryllium-containing waste, and beryllium-contaminated equipment and other items that are disposed of as waste, through the application of waste minimization principles.

(b) Beryllium-containing waste, and beryllium-contaminated equipment and other items that are disposed of as waste, must be disposed of in sealed, impermeable bags, containers, or

enclosures to prevent the release of beryllium dust during handling and transportation. The bags, containers, and enclosures that are used for disposal of beryllium waste must be labeled according to § 850.38.

§ 850.33 Beryllium emergencies.

(a) The responsible employer must comply with 29 CFR 1910.120(l) for handling beryllium emergencies related to decontamination and decommissioning operations.

(b) The responsible employer must comply with 29 CFR 1910.120(q) for handling beryllium emergencies related to all other operations.

§ 850.34 Medical surveillance.

(a) *General.* (1) The responsible employer must establish and implement a medical surveillance program for beryllium-associated workers who voluntarily participate in the program.

(2) The responsible employer must designate a Site Occupational Medical Director (SOMD) who is responsible for administering the medical surveillance program.

(3) The responsible employer must ensure that the medical evaluations and procedures required by this section are performed by, or under the supervision of, a licensed physician who is familiar with the health effects of beryllium.

(4) The responsible employer must establish, and maintain, a list of beryllium-associated workers who may be eligible for protective measures under this part. The list must be:

(i) Based on the hazard assessment, exposure records, and other information regarding the identity of beryllium-associated workers; and

(ii) Adjusted at regular intervals based on periodic evaluations of beryllium-associated workers performed under paragraph (b)(2) of this section;

(5) The responsible employer must provide the SOMD with the information needed to operate and administer the medical surveillance program, including the:

(i) List of beryllium-associated workers required by paragraph (a)(4) of this section;

(ii) Baseline inventory;

(iii) Hazard assessment and exposure monitoring data;

(iv) Identity and nature of activities or operations on the site that are covered under the CBDPP, related duties of beryllium-associated workers; and

(v) Type of personal protective equipment used.

(6) The responsible employer must provide the following information to the SOMD and the examining physician:

(i) A copy of this rule and its preamble;

(ii) A description of the worker's duties as they pertain to beryllium exposure;

(iii) Records of the worker's beryllium exposure; and

(iv) A description of the personal protective and respiratory protective equipment used by the worker in the past, present, or anticipated future use.

(b) *Medical evaluations and procedures.* The responsible employer must provide, to beryllium-associated workers who voluntarily participate in the medical surveillance program, the medical evaluations and procedures required by this section at no cost and at a time and place that is reasonable and convenient to the worker.

(1) *Baseline medical evaluation.* The responsible employer must provide a baseline medical evaluation to beryllium-associated workers. This evaluation must include:

(i) A detailed medical and work history with emphasis on past, present, and anticipated future exposure to beryllium;

(ii) A respiratory symptoms questionnaire;

(iii) A physical examination with special emphasis on the respiratory system, skin and eyes;

(iv) A chest radiograph (posterior-anterior, 14 x 17 inches) interpreted by a National Institute for Occupational Safety and Health (NIOSH) B-reader of pneumoconiosis or a board-certified radiologist (unless a baseline chest radiograph is already on file);

(v) Spirometry consisting of forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV1);

(vi) A Be-LPT; and

(vii) Any other tests deemed appropriate by the examining physician for evaluating beryllium-related health effects.

(2) *Periodic evaluation.* (i) The responsible employer must provide to beryllium workers a medical evaluation annually, and to other beryllium-associated workers a medical evaluation every three years. The periodic medical evaluation must include:

(A) A detailed medical and work history with emphasis on past, present, and anticipated future exposure to beryllium;

(B) A respiratory symptoms questionnaire;

(C) A physical examination with emphasis on the respiratory system;

(D) A Be-LPT; and

(E) Any other medical evaluations deemed appropriate by the examining physician for evaluating beryllium-related health effects.

(ii) The responsible employer must provide to beryllium-associated workers a chest radiograph every five years.

(3) *Emergency evaluation.* The responsible employer must provide a medical evaluation as soon as possible to any worker who may have been exposed to beryllium because of a beryllium emergency. The medical evaluation must include the requirements of paragraph (b)(2) of this section.

(c) *Multiple physician review.* The responsible employer must establish a multiple physician review process for beryllium-associated workers that allows for the review of initial medical findings, determinations, or recommendations from any medical evaluation conducted pursuant to paragraph (b) of this section.

(1) If the responsible employer selects the initial physician to conduct any medical examination or consultation provided to a beryllium-associated worker, the worker may designate a second physician to:

(i) Review any findings, determinations, or recommendations of the initial physician; and

(ii) Conduct such examinations, consultations and laboratory tests, as the second physician deems necessary to facilitate this review.

(2) The responsible employer must promptly notify a beryllium-associated worker in writing of the right to seek a second medical opinion after the initial physician provided by the responsible employer conducts a medical examination or consultation.

(3) The responsible employer may condition its participation in, and payment for, multiple physician review upon the beryllium-associated worker doing the following within fifteen (15) days after receipt of the notice, or receipt of the initial physician's written opinion, whichever is later:

(i) Informing the responsible employer in writing that he or she intends to seek a second medical opinion; and

(ii) Initiating steps to make an appointment with a second physician.

(4) If the findings, determinations, or recommendations of the second physician differ from those of the initial physician, then the responsible employer and the beryllium-associated worker must make efforts to encourage and assist the two physicians to resolve any disagreement.

(5) If, despite the efforts of the responsible employer and the beryllium-associated worker, the two physicians are unable to resolve their disagreement, then the responsible employer and the worker, through their respective physicians, must designate a third physician to:

(i) Review any findings, determinations, or recommendations of the other two physicians; and

(ii) Conduct such examinations, consultations, laboratory tests, and consultations with the other two physicians, as the third physician deems necessary to resolve the disagreement among them.

(6) The SOMD must act consistently with the findings, determinations, and recommendations of the third physician, unless the SOMD and the beryllium-associated worker reach an agreement that is consistent with the recommendations of at least one of the other two physicians.

(d) *Alternate physician determination.* The responsible employer and the beryllium-associated worker or the worker's designated representative may agree upon the use of any alternate form of physician determination in lieu of the multiple physician review process provided by paragraph (c) of this section, so long as the alternative is expeditious and at least as protective of the worker.

(e) *Written medical opinion and recommendation.* (1) Within two weeks of receipt of results, the SOMD must provide to the responsible employer a written, signed medical opinion for each medical evaluation performed on each beryllium-associated worker. The written opinion must take into account the findings, determinations and recommendations of the other examining physicians who may have examined the beryllium-associated worker. The SOMD's opinion must contain:

(i) The diagnosis of the worker's condition relevant to occupational exposure to beryllium, and any other medical condition that would place the worker at increased risk of material impairment to health from further exposure to beryllium;

(ii) Any recommendation for removal of the worker from DOE beryllium activities, or limitation on the worker's activities or duties or use of personal protective equipment, such as a respirator; and

(iii) A statement that the SOMD or examining physician has clearly explained to the worker the results of the medical evaluation, including all tests results and any medical condition related to beryllium exposure that requires further evaluation or treatment.

(2) The SOMD's written medical opinion must not reveal specific records, findings, and diagnoses that are not related to medical conditions that may be affected by beryllium exposure.

(f) *Information provided to the beryllium-associated worker.* (1) The SOMD must provide each beryllium-associated worker with a written medical opinion containing the results of all medical tests or procedures, an explanation of any abnormal findings, and any recommendation that the worker be referred for additional testing for evidence of CBD, within 10 working days after the SOMD's receipt of the results of the medical tests or procedures.

(2) The responsible employer must, within 30 days after a request by a beryllium-associated worker, provide the worker with the information the responsible employer is required to provide the examining physician under paragraph (a)(6) of this section.

(g) *Reporting.* The responsible employer must report on the applicable OSHA reporting form beryllium sensitization, CBD, or any other abnormal condition or disorder of workers caused or aggravated by occupational exposure to beryllium.

(h) *Data analysis.* (1) The responsible employer must routinely and systematically analyze medical, job, and exposure data with the aim of identifying individuals or groups of individuals potentially at risk for CBD and working conditions that are contributing to that risk.

(2) The responsible employer must use the results of these analyses to identify additional workers to whom the responsible employer must provide medical surveillance and to determine the need for additional exposure controls.

§ 850.35 Medical removal.

(a) *Medical removal protection.* The responsible employer must offer a beryllium-associated worker medical removal from exposure to beryllium if the SOMD determines in a written medical opinion that it is medically appropriate to remove the worker from such exposure. The SOMD's determination must be based on one or more positive Be-LPT results, chronic beryllium disease diagnosis, an examining physician's recommendation, or any other signs or symptoms that the SOMD deems medically sufficient to remove a worker.

(1) *Temporary removal pending final medical determination.* The responsible employer must offer a beryllium-associated worker temporary medical removal from exposure to beryllium on each occasion that the SOMD determines in a written medical opinion that the worker should be temporarily removed from such exposure pending a final medical determination of whether the worker should be removed permanently.

(i) In this section, "final medical determination" means the outcome of the multiple physician review process or the alternate medical determination process provided for in paragraphs (c) and (d) of § 850.34.

(ii) If a beryllium-associated worker is temporarily removed from beryllium exposure pursuant to this section, the responsible employer must transfer the worker to a comparable job for which the worker is qualified (or for which the worker can be trained in a short period) and where beryllium exposures are as low as possible, but in no event at or above the action level.

(iii) The responsible employer must maintain the beryllium-associated worker's total normal earnings, seniority, and other worker rights and benefits as if the worker had not been removed.

(iv) If there is no such job available, the responsible employer must provide to the beryllium-associated worker the medical removal protection benefits specified in paragraph (b)(2) of this section, until a job becomes available or for one year, whichever comes first.

(2) *Permanent medical removal.* (i) The responsible employer must offer a beryllium-associated worker permanent medical removal from exposure to beryllium if the SOMD determines in a written medical opinion that the worker should be permanently removed from exposure to beryllium.

(ii) If a beryllium-associated worker is removed permanently from beryllium exposure based on the SOMD's recommendation pursuant to this section, the responsible employer must provide the worker the medical removal protection benefits specified in paragraph (b) of this section.

(3) *Worker consultation before temporary or permanent medical removal.* If the SOMD determines that a beryllium-associated worker should be temporarily or permanently removed from exposure to beryllium, the SOMD must:

(i) Advise the beryllium-associated worker of the determination that medical removal is necessary to protect the worker's health;

(ii) Provide the beryllium-associated worker with a copy of this rule and its preamble, and any other information the SOMD deems necessary on the risks of continued exposure to beryllium and the benefits of removal;

(iii) Provide the beryllium-associated worker the opportunity to have any questions concerning medical removal answered; and

(iv) Obtain the beryllium-associated worker's signature acknowledging that the worker has been advised to accept

medical removal from beryllium exposure as provided in this section, and has been provided with the information specified in this paragraph, on the benefits of removal and the risks of continued exposure to beryllium.

(4) *Return to work after medical removal.* (i) The responsible employer, subject to paragraph (a)(4)(ii) of this section, must not return a beryllium-associated worker who has been permanently removed under this section to the worker's former job status unless the SOMD first determines in a written medical opinion that continued medical removal is no longer necessary to protect the worker's health.

(ii) Not withstanding paragraph (a)(4)(i) of this section, if, in the SOMD's opinion, continued exposure to beryllium will not pose an increased risk to the beryllium-associated worker's health, and medical removal is an inappropriate remedy in the circumstances, the SOMD must fully discuss these matters with the worker and then, in a written determination, may authorize the responsible employer to return the worker to his or her former job status. Thereafter, the returned beryllium-associated worker must continue to be provided with medical surveillance under § 850.34 of this part.

(b) *Medical removal protection benefits.* (1) If a beryllium-associated worker has been permanently removed from beryllium exposure pursuant to paragraph (a)(2) of this section, the responsible employer must provide the beryllium-associated worker:

(i) The opportunity to transfer to another position which is available, or later becomes available, for which the beryllium-associated worker is qualified (or for which the worker can be trained in a short period) and where beryllium exposures are as low as possible, but in no event at or above the action level; or

(ii) If the beryllium-associated worker cannot be transferred to a comparable job where beryllium exposures are below the action level, a maximum of 2 years of permanent medical removal protection benefits (specified in paragraph (b)(2) of this section).

(2) If required by this section to provide medical removal protection benefits, the responsible employer must maintain the removed worker's total normal earnings, seniority and other worker rights and benefits, as though the worker had not been removed.

(3) If a removed beryllium-associated worker files a claim for workers' compensation payments for a beryllium-related disability, then the responsible employer must continue to provide medical removal protection benefits pending disposition of the claim. The responsible employer must receive no credit for the workers' compensation payments received by the worker for treatment related expenses.

(4) The responsible employer's obligation to provide medical removal protection benefits to a removed beryllium-associated worker is reduced to the extent that the worker receives compensation for earnings lost during the period of removal either from a publicly- or employer-funded compensation program, or from employment with another employer made possible by virtue of the worker's removal.

(5) For the purposes of this section, the requirement that a responsible employer provide medical removal protection benefits is not intended to expand upon, restrict, or change any rights to a specific job classification or position under the terms of an applicable collective bargaining agreement.

(6) The responsible employer may condition the provision of medical removal protection benefits upon the beryllium-associated worker's participation in medical surveillance provided in accordance with § 850.34 of this part.

§ 850.36 Medical consent.

(a) The responsible employer must provide each beryllium-associated worker with a summary of the medical surveillance program established in § 850.34 at least one week before the first medical evaluation or procedure or at any time requested by the worker. This summary must include:

(1) The type of data that will be collected in the medical surveillance program;

(2) How the data will be collected and maintained;

(3) The purpose for which the data will be used; and

(4) A description of how confidential data will be protected.

(b) Responsible employers must also provide each beryllium-associated worker with information on the benefits and risks of the medical tests and examinations available to the worker at least one week prior to any such examination or test, and an opportunity to have the worker's questions answered.

(c) The responsible employer must have the SOMD obtain a beryllium-associated worker's signature on the informed consent form found in Appendix A to this part, before performing medical evaluations or any tests.

§ 850.37 Training and counseling.

(a) The responsible employer must develop and implement a beryllium training program and ensure participation for:

(1) Beryllium-associated workers;

(2) All other individuals who work at a site where beryllium activities are conducted.

(b) The training provided for workers identified in paragraph (a)(1) of this section, must:

(1) Be in accordance with 29 CFR 1910.1200, Hazard Communication;

(2) Include the contents of the CBDPP; and

(3) Include potential health risks to beryllium worker family members and others who may come in contact with beryllium on beryllium workers or beryllium workers' personal clothing or other personal items as the result of a beryllium control failure at a DOE facility.

(c) The training provided for workers identified in paragraph (a)(2) of this section must consist of general awareness about beryllium hazards and controls.

(d) The responsible employer must provide the training required by this section before or at the time of initial assignment and at least every two years thereafter.

(e) The employer must provide retraining when the employer has reason to believe that a beryllium worker lacks the proficiency, knowledge, or understanding needed to work safely with beryllium, including at least the following situations:

(1) To address any new beryllium hazards resulting from a change to operations, procedures, or beryllium controls about which the beryllium worker was not previously trained; and

(2) If a beryllium worker's performance involving beryllium work indicates that the worker has not retained the requisite proficiency.

(f) The responsible employer must develop and implement a counseling program to assist beryllium-associated workers who are diagnosed by the SOMD to be sensitized to beryllium or to have CBD. This counseling program must include communicating with beryllium-associated workers concerning:

(1) The medical surveillance program provisions and procedures;

(2) Medical treatment options;

(3) Medical, psychological, and career counseling;

(4) Medical benefits;

(5) Administrative procedures and workers rights under applicable Workers' Compensation laws and regulations;

(6) Work practice procedures limiting beryllium-associated worker exposure to beryllium; and

(7) The risk of continued beryllium exposure after sensitization.

§ 850.38 Warning signs and labels.

(a) *Warning signs.* The responsible employer must post warning signs at each access point to a regulated area with the following information:

DANGER
BERYLLIUM CAN CAUSE LUNG DAMAGE
CANCER HAZARD
AUTHORIZED PERSONNEL ONLY

(b) *Warning labels.* (1) The responsible employer must affix warning labels to all containers of beryllium, beryllium compounds, or beryllium-contaminated clothing, equipment, waste, scrap, or debris.

(2) Warning labels must contain the following information:

DANGER
CONTAMINATED WITH BERYLLIUM
DO NOT REMOVE DUST BY BLOWING OR SHAKING
CANCER AND LUNG DISEASE HAZARD

(c) Warning signs and labels must be in accordance with 29 CFR 1910.1200, Hazard Communication.

§ 850. 39 Recordkeeping and use of information.

(a) The responsible employer must establish and maintain accurate records of all beryllium inventory information, hazard assessments, exposure measurements, exposure controls, and medical surveillance.

(b) Heads of DOE Departmental Elements must:

(1) Designate all record series as required under this rule as agency records and, therefore, subject to all applicable agency records management and access laws; and

(2) Ensure that these record series are retained for a minimum of seventy-five years.

(c) The responsible employer must convey to DOE or its designee all record series required under this rule if the employer ceases to be involved in the CBDPP.

(d) The responsible employer must link data on workplace conditions and health outcomes in order to establish a basis for understanding the beryllium health risk.

(e) The responsible employer must ensure the confidentiality of all work-related records generated under this rule by ensuring that:

(1) All records that are transmitted to other parties do not contain names, social security numbers or any other variables, or combination of variables, that could be used to identify particular individuals; and

(2) Individual medical information generated by the CBDPP is:

(i) Either included as part of the worker's site medical records and maintained by the SOMD, or is maintained by another physician designated by the responsible employer;

(ii) Maintained separately from other records; and

(iii) Used or disclosed by the responsible employer only in conformance with any applicable requirements imposed by the Americans with Disabilities Act, the Privacy Act of 1974, the Freedom of Information Act, and any other applicable law.

(f) The responsible employer must maintain all records required by this part in current and accessible electronic systems, which include the ability readily to retrieve data in a format that maintains confidentiality.

(g) The responsible employer must transmit all records generated as required by this rule, in a format that protects the confidentiality of individuals, to the DOE Assistant Secretary for Environment, Safety and Health on request.

(h) The responsible employer must semi-annually transmit to the DOE Office of Epidemiologic Studies within the Office of Environment, Safety and Health an electronic registry of beryllium-associated workers that protects confidentiality, and the registry must include, but is not limited to, a unique identifier, date of birth, gender, site, job history, medical screening test results, exposure measurements, and results of referrals for specialized medical evaluations.

§ 850.40 Performance feedback.

(a) The responsible employer must conduct periodic analyses and assessments of monitoring activities, hazards, medical surveillance, exposure reduction and minimization, and occurrence reporting data.

(b) To ensure that information is available to maintain and improve all elements of the CBDPP continuously, the responsible employer must give results of periodic analyses and assessments to the line managers, planners, worker protection staff, workers, medical staff, and labor organizations representing beryllium-associated workers who request such information.

Appendix A to Part 850—Chronic Beryllium Disease Prevention Program Informed Consent Form

I, have carefully read and understand the attached information about the Be-LPT and other medical tests. I have had the opportunity to ask any questions that I may have had concerning these tests.

I understand that this program is voluntary and I am free to withdraw at any time from all or any part of the medical surveillance program. I understand that the tests are confidential, but not anonymous. I understand that if the results of any test suggest a health problem, the examining physician will discuss the matter with me, whether or not the result is related to my work with beryllium. I understand that my employer will be notified of my diagnosis only if I have a beryllium sensitization or chronic beryllium disease. My employer will not receive the results or diagnoses of any health conditions not related to beryllium exposure.

I understand that, if the results of one or more of these tests indicate that I have a health problem that is related to beryllium, additional examinations will be recommended. If additional tests indicate I do have a beryllium sensitization or CBD, the Site Occupational Medical Director may recommend that I be removed from working with beryllium. If I agree to be removed, I understand that I may be transferred to another job for which I am qualified (or can be trained for in a short period) and where my beryllium exposures will be as low as possible, but in no case above the action level. I will maintain my total normal earnings, seniority, and other benefits for up to two years if I agree to be permanently removed.

I understand that if I apply for another job or for insurance, I may be requested to release my medical records to a future employer or an insurance company.

I understand that my employer will maintain all medical information relative to the tests performed on me in segregated medical files separate from my personnel files, treated as confidential medical records, and used or disclosed only as provided by the Americans with Disability Act, the Privacy Act of 1974, or as required by a court order or under other law.

I understand that the results of my medical tests for beryllium will be included in the Beryllium Registry maintained by DOE, and that a unique identifier will be used to maintain the confidentiality of my medical information. Personal identifiers will not be included in any reports generated from the DOE Beryllium Registry. I understand that the results of my tests and examinations may be published in reports or presented at meetings, but that I will not be identified.

I consent to having the following medical evaluations:

/ / Physical examination concentrating on my lungs and breathing
/ / Chest X-ray
/ / Spirometry (a breathing test)
/ / Blood test called the beryllium-induced lymphocyte proliferation test or Be-LPT
/ / Other test(s). Specify:

Signature of Participant:

Date:

I have explained and discussed any questions that the employee expressed concerning the Be-LPT, physical examination, and other medical testing as well as the implications of those tests.

Name of Examining Physician:

Signature of Examining Physician:

Dated:

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