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LEASE AGREEMENT
BETWEEN
THE UNITED STATES DEPARTMENT OF ENERGY
AND
THE UNITED STATES ENRICHMENT CORPORATION

DATED AS OF JULY 1, 1993

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LIST OF EXHIBITS

Exhibit A	Leased Premises
Exhibit B	Leased Personalty
Exhibit C	Environmental and Waste Management Agreement
Exhibit D	Regulatory Oversight Agreement
Exhibit E	Electric Power Agreement
Exhibit F	Services Agreement

THIS LEASE AGREEMENT ("Lease") is entered into as of July 1, 1993, between THE UNITED STATES DEPARTMENT OF ENERGY ("Department"), acting by and through the Secretary of Energy ("Secretary"), and THE UNITED STATES ENRICHMENT CORPORATION ("Corporation"), acting by and through its Transition Manager ("Transition Manager").

WITNESSETH:

WHEREAS, the Congress of the United States of America has enacted the Energy Policy Act of 1992, Public Law 102-486, and pursuant to Title IX thereof further amended the Atomic Energy Act of 1954, which as amended (the "Act") established a new government corporation, the Corporation; and

WHEREAS, pursuant to Section 1403 of the Act, Congress has directed the Corporation to lease the gaseous diffusion uranium enrichment plant owned by the United States located at Paducah, Kentucky, and the gaseous diffusion uranium enrichment plant owned by the United States located at Portsmouth, Ohio and their related property, (as more fully described below, the "GDPs"), which GDPs are presently controlled and operated by the Department; and

WHEREAS, pursuant to Section 1701 of the Act, the United States Nuclear Regulatory Commission ("NRC") will develop for the GDPs such standards by regulation as are necessary to protect public health and safety from radiological hazard and to provide for the common defense and security, and until the NRC certifies that the Corporation has complied with such standards, or the NRC certifies a plan prepared by the Department for achieving such compliance, the GDPs will be operated under the Department's regulatory oversight and control; and

WHEREAS, in order to ensure that the Corporation achieves the objectives of the Act with respect to uranium enrichment and otherwise, and to prepare the Corporation for its eventual privatization, and consistent with the Department's duties under the Act, Congress has directed that the Secretary transfer to the Corporation certain property of the Department and that the Corporation lease certain property of the GDPs for an initial term commencing on July 1, 1993;

NOW THEREFORE, under the authority of the Act and subject to its provisions, and in order to carry out the mandates which Congress has given the Department and the Corporation therein, the Department and the Corporation hereby agree to this Lease as follows:

ARTICLE I
DEFINITIONS

Section 1.1 Terms The following additional terms when capitalized and used in this Lease (including the Exhibits hereto) shall have the meanings indicated below. The meanings specified are applicable to both the singular and the plural.

"Additional Rent" shall have the meaning ascribed to it in Section 8.1 hereof.

"Base Rent" shall have the meaning ascribed to it in Section 8.1 hereof.

"Capital Improvement" means any change, alteration, addition, or other improvement made by the Corporation to the Leased Premises (as such term is hereinafter defined) which does not constitute routine maintenance or repair of such Leased Premises.

"Common Areas" shall have the meaning ascribed to it in Section 3.1(b) hereof.

"Corporation Site Manager" shall have the meaning ascribed to it in Section 11.1(b) hereof.

"Corrective Actions" shall have the meaning given to such term in the Solid Waste Disposal Act, as amended.

"Decontamination and Decommissioning" means those activities, including Response Actions or Corrective Actions, undertaken to decontaminate and decommission inactive uranium enrichment facilities and related property.

"Department Site Manager" shall have the meaning ascribed to it in Section 11.1(a) hereof.

"Determination Order" means the order effective July 1, 1993, issued by the United States Office of Management and Budget with respect to the transfer of certain property related to the GDPs, and any subsequent amendment of such order.

"Electric Power Agreement" shall have the meaning ascribed to it in Section 6.1 hereof.

"Environmental Claim" means any claim, action, cause of action, investigation or notice by any person or entity alleging potential liability (including potential liability for investigatory costs, cleanup costs, governmental Response Actions, Correc-

tive Actions, natural resource damages, property damages, personal injuries, penalties, or fines) arising out of, based on or resulting from (a) the presence, or release into the environment, of any Material of Environmental Concern at any location or (b) circumstances forming the basis of any violation, or alleged violation, of any Environmental Laws.

"Environmental Laws" means all laws, regulations and other requirements established by any Government Authority relating to pollution or protection of human health or the environment (including ambient air, surface water, ground water, land surface or subsurface strata) or regulating the handling of or exposure to radioactive materials, including the laws and regulations relating to emissions, discharges, releases or threatened releases of Material of Environmental Concern, or otherwise relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of Material of Environmental Concern.

"Environmental and Waste Management Agreement" shall have the meaning ascribed to it in Section 3.3 hereof.

"Environmentally Non-Sensitive" means any action which does not materially increase the risk of a violation of Environmental Laws and does not materially increase the cost of Decontamination and Decommissioning.

"Environmentally Sensitive" means any action which materially increases the risk of a violation of Environmental Laws or materially increases the cost of Decontamination and Decommissioning.

"GDPs" means the gaseous diffusion uranium enrichment plant owned by the United States of America located at Paducah, Kentucky, and the gaseous diffusion uranium enrichment plant owned by the United States at Portsmouth, Ohio, including all the real property within the boundary of both such plants, or any portion thereof, regardless of whether any such real property is leased to the Corporation. Any reference in this Lease to a "GDP" shall mean either one of such gaseous diffusion uranium enrichment plants.

"Government Authority" means any department, agency or instrumentality of the federal government, or any state, or of any municipality or of any political subdivision of any state or municipality.

"Initial Rent Period" shall have the meaning ascribed to it in Section 8.1 hereof.

"Laws and Regulations" means all laws and regulations (including all Environmental Laws), and other requirements of any

Government Authority (including any standards established by the NRC to protect public health and safety from radiological hazard and to provide for the common defense and security) which apply to the Department or the Corporation, as the case may be.

"Lease" means this Lease and all its Exhibits.

"Lease Administration" shall have the meaning ascribed to it in Section 8.1 hereof.

"Lease Term" means the period of July 1, 1993, to June 30, 1999, and any subsequent Renewal Periods.

"Leased Personalty" shall have the meaning ascribed to it in Section 3.2 hereof.

"Leased Premises" shall have the meaning ascribed to it in Section 3.1(a) hereof.

"Material of Environmental Concern" means any material subject to classification as a hazardous waste under the Solid Waste Disposal Act, as amended, and any material such as pollutants, contaminants, wastes, toxic substances, petroleum and refined petroleum products, hazardous substances, radioactive materials and other like subject matter.

"Regulatory Agency" means any Government Authority which is empowered to administer or enforce Laws and Regulations.

"Regulatory Oversight Agreement" shall have the meaning ascribed to it in Section 5.1(b)(i) hereof.

"Regulatory Permits" means all licenses, permits, certificates, approvals, authorizations and other requirements mandated by Laws and Regulations for the occupation, use or operation of the Leased Premises.

"Renewal Period" shall have the meaning ascribed to it in Section 7.2 hereof.

"Rent" shall have the meaning ascribed to it in Section 8.1 hereof.

"Rent Period" shall have the meaning ascribed to it in Section 8.1 hereof.

"Response Actions" shall have the meaning given such term in the Comprehensive Environmental Response, Compensation and Liability Act, as amended.

"Services Agreement" shall have the meaning ascribed to it in Section 6.2 hereof.

"Transferred Contracts" means any and all contracts which are transferred to the Corporation pursuant to the Determination Order.

"Turnover Requirements" shall have the meaning ascribed to it in Section 4.4 hereof.

"Uranium Enrichment Enterprise" means the GDPs, their uranium enrichment operations, processes and services, and all of the activities, businesses and functions related thereto.

Section 1.2 Headings Article and Section headings in this Lease are provided only for ease of reference and not interpretation.

Section 1.3 Rules of Interpretation

(a) The words "without limitation", whether stated or not, are implied to follow the use of any words such as "including" or "excluding" that are employed in this Lease. The words "hereof" or "herein" or "hereunder" when used in this Lease shall mean pertaining to this Lease.

(b) All Exhibits to this Lease shall be incorporated into this Lease by reference as appropriate and will be deemed to be an integral part of this Lease. In the event of any inconsistency between an Exhibit and this Lease, this Lease shall control.

ARTICLE II AUTHORITY OF THE PARTIES

Section 2.1 Corporation The Corporation is authorized under the Act to enter into this Lease and its Transition Manager has taken all the necessary actions required of the Corporation to execute and deliver this Lease.

Section 2.2 Department The Department is authorized under the Act to enter into this Lease and the Secretary has taken all the necessary actions required of the Department to execute and deliver this Lease.

Section 2.3 Corporation Board of Directors In accordance with Section 1315 of the Act, the actions of the Transition Manager taken with respect to this Lease shall be subject to ratification by the Board of Directors of the Corporation, after a quorum of such Board of Directors has been appointed by the President of the United States and confirmed by the United States Senate.

ARTICLE III
GRANT OF LEASE

Section 3.1 Lease of Real Property

(a) The Department hereby leases to the Corporation that certain real property and improvements and fixtures located thereon, and easements, rights of way and appurtenances related thereto of the GDP situated in Paducah, Kentucky, and of the GDP situated in Portsmouth, Ohio, all of which is more fully identified and described in the maps and attachments which form Exhibit A to this Lease ("Leased Premises"). This Lease is subject to all existing easements, rights of way and appurtenances over, across, in, and upon the Leased Premises. The Department will not grant any additional easements, rights of way or appurtenances with respect to the Leased Premises without the approval of the Corporation, which approval shall not be unreasonably withheld.

(b) The occupation and use of the Leased Premises by the Corporation shall include the use of all easements, rights of way, appurtenances, utility lines, corridors, common walls, pipes, parking areas, service roads, railway lines, loading facilities, sidewalks, avenues of ingress, egress and access and all other similar items which appertain to the Leased Premises ("Common Areas").

(c) The Department reserves the right to have access to the Leased Premises and the Common Areas, and the Corporation shall be entitled to have access to those parts of a GDP which are not part of the Leased Premises, subject to notice and the procedures to be agreed upon by the Department and the Corporation. Notwithstanding anything contained in this subsection (c), the Department and the Corporation will each have such access as it requires to all parts of a GDP reasonably necessary to respond to emergencies.

Section 3.2 Lease of Personal Property The Department hereby leases to the Corporation those certain items of personal property located on the Leased Premises related to the production of enriched uranium by the GDPs, including the converters, compressors, motors and spares associated thereto and the other items more fully described in Exhibit B ("Leased Personalty").

Section 3.3 Department's Personal Property on the Leased Premises

(a) The Department's personal property (including any Material of Environmental Concern) located on the Leased Premises on July 1, 1993, may remain on the Leased Premises. The

Department may not bring on to the Leased Premises any Material of Environmental Concern (except refined petroleum products incidental to the operation of vehicles, equipment or machinery) without the consent of the Corporation and subject to any conditions upon which the Department and the Corporation may agree; provided, however, that the Department may store additional personal property which is Material of Environmental Concern on the Leased Premises after July 1, 1993, pursuant to a Memorandum of Agreement with respect to environmental matters and waste management, effective July 1, 1993, between the Department and the Corporation which is attached as Exhibit C to this Lease, and any amendment thereof ("Environmental and Waste Management Agreement").

(b) The Department shall be solely responsible for the care and maintenance of the Department's personal property (including Material of Environmental Concern) located on the Leased Premises, whether located thereon on July 1, 1993, or brought onto the Leased Premises after July 1, 1993, and the Corporation shall not be held liable for any Environmental Claim related thereto, except to the extent such liability arises out of the Corporation's negligence or wilful misconduct.

(c) The Department will be solely responsible for and shall pay the cost of removing from the Leased Premises and disposing of all its personal property located on the Leased Premises and for the Decontamination and Decommissioning of such personal property.

Section 3.4 Option to Expand or Reduce Leasehold
Subject to the procedures described in Section 3.5 of this Lease, the Corporation shall have the option to expand or reduce the scope of this Lease in the following manner:

(a) The Corporation may amend Exhibit A to include within this Lease additional real property, improvements and fixtures of the Department located at a GDP along with its related easements and appurtenances. The Department will not dispose of any real property of a GDP which is not part of the Leased Premises without first offering the Corporation the opportunity to include such real property within this Lease.

(b) The Corporation may amend Exhibit A to delete from this Lease and return to the Department any of the facilities listed on Exhibit A or any of the land identified as Leased Premises on the maps in Exhibit A. Such right shall not include the right of the Corporation to terminate this Lease in its entirety or to terminate this Lease with respect to one of the GDPs, which right shall be permitted only in accordance with Section 9.3 and Section 12.1 of this Lease.

(c) The Corporation may amend Exhibit B to include within this Lease additional items of personal property related to a GDP whether located at such GDP, or at another Department site. If such property is located at another Department site, the Corporation will identify for the Department the relevant item prior to November 1, 1993, and the Department will place an identification tag on the item to indicate the Corporation's interest in such item. The Department will not dispose of or otherwise utilize the identified item without offering the Corporation the opportunity to include such item within this Lease. The Department will have no responsibility for maintaining such identified item and the Corporation shall be responsible for paying the cost of removing and transporting the desired item to the Leased Premises.

(d) The Corporation may delete from Exhibit B to this Lease and return to the Department any part of the Leased Personalty. The Corporation will not be entitled to delete and return individual items of the Leased Personalty, but may delete from this Lease and return to the Department only entire categories of the Leased Personalty.

Section 3.5 Option Procedures

(a) If the Corporation seeks to exercise any option described in Section 3.4 of this Lease the Corporation shall provide sixty (60) days notice thereof to the Department. The Department will review the request and upon the Department's consent, which shall not be unreasonably withheld, Exhibits A and B, as the case may be, will be amended to reflect the change.

(b) If any item of property is returned to the Department pursuant to subsections (b) or (d) of Section 3.4 of this Lease, such property will be returned to the Department in the condition in which such property is found on the date returned. The Corporation will have no obligation to place the property in any better condition. Prior to returning any of the Leased Premises to the Department, the Corporation will comply with the Turnover Requirements.

Section 3.6 Quiet Enjoyment The Department warrants that the Corporation will have full possession, use and quiet enjoyment of the Leased Premises and Leased Personalty throughout the Lease Term. The Department will defend, at any time, at its expense, against any person or entity, the right of the Corporation to such full possession, use and quiet enjoyment.

Section 3.7 Department Option The Department shall have the right to request the return to the Department of up to ten (10) acres of the Leased Premises at each GDP. The Corporation will not withhold its consent to such a request if the real property being returned is not required for the Corporation's

planned business use. If any such real property is returned to the Department, it shall be returned to the Department in the condition in which it is found on that date. The Corporation shall have no obligation to put such real property in any better condition and will have no obligation to comply with the Turnover Requirements. Upon the return to the Department of any real property pursuant to this Section, Exhibit A will be amended to reflect the change.

ARTICLE IV
LEASED PREMISES
AND LEASED PERSONALTY

Section 4.1 Use of Leased Premises and Leased Personalty The Corporation will use the Leased Premises and the Leased Personalty for the purpose of producing enriched uranium and for such other purposes as may be authorized by the Act. The Corporation may engage in a use of the Leased Premises or Leased Personalty at a GDP which is not for the purpose of producing enriched uranium if the Department consents to such use, which consent shall not be withheld if the use proposed by the Corporation is Environmentally Non-Sensitive and does not significantly interfere with the Department's activities at such GDP.

Section 4.2 Physical Condition of Leased Premises and Leased Personalty

(a) The physical condition of the Leased Premises and the physical condition of the Leased Personalty is as the Leased Premises and Leased Personalty are found on July 1, 1993. The foregoing description of the physical condition of the Leased Premises and Leased Personalty shall not limit the indemnification and reimbursement of the Corporation provided by the Department in Article V of this Lease.

(b) The Corporation acknowledges that the Leased Premises and the Leased Personalty are in good and serviceable condition for use by the Corporation to produce enriched uranium.

(c) The Corporation will, at its expense, throughout the Lease Term, maintain the Leased Premises in good and serviceable condition. The Corporation shall repair any of the Leased Premises when in the Corporation's business judgment it is necessary to do so in order to maintain them in such condition or to meet the requirements of applicable Laws and Regulations. This obligation of the Corporation shall not affect the Corporation's right to return the Leased Premises and the Leased Personalty to the Department in the condition in which such Leased Premises and Leased Personalty are found on the day they are returned to the Department pursuant to other provisions of this Lease.

Section 4.3 Return of Leased Premises and Leased Personality

(a) At the end of the Lease Term, the Corporation will return the Leased Premises and Leased Personality to the Department in the condition in which the Leased Premises and Leased Personality are found on that date. The Corporation will have no obligation to place the Leased Premises and Leased Personality in any better condition. Prior to returning the Leased Premises and Leased Personality to the Department, the Corporation will comply with the Turnover Requirements.

(b) At the end of the Lease Term, the Corporation may remove any of its personal property from the Leased Premises. The Corporation shall be entitled, should it choose, to leave any of its personal property (including personal property contaminated by radioactive materials) on the Leased Premises at the end of the Lease Term for Decontamination and Decommissioning by the Department.

Section 4.4 Turnover Requirements At the end of the Lease Term or at any time the Corporation exercises its option in Section 3.4(b) hereof or terminates this Lease pursuant to Section 12.1 hereof, or terminates this Lease pursuant to Section 9.3 hereof (except that in the case of termination under such Section 9.3, only with respect to facilities which are not destroyed), the Corporation shall, prior to returning to the Department any facility which constitutes the Leased Premises, take the following actions with respect to such facility (collectively such actions being referred to as the "Turnover Requirements"):

(a) Provide the Department with documentation of its plans to place such facility into an acceptable condition for return to the Department consistent with the requirements described in subsections (b) through (f) of this Section.

(b) Terminate facility operations. Complete and document the final deactivation/shutdown of the facility and document that no future use of the facility is planned. Remove solid deposits of UO_2F_2/UF_4 to the extent necessary to prevent criticality, using an in-place removal process, such as the chemical fluorination treatment; and ensure that nothing adversely affects the operability of the purge cascade, the coolant, drainage, storage systems, HV/AC systems and air filtration systems.

(c) Remove all waste generated by the Corporation in such facility (including any material that is subject to classification as a hazardous waste under the Solid Waste Disposal Act, as amended) and which is subject to and authorized by Laws and Regulations for offsite disposal. The Corporation will

remain responsible for the ultimate treatment and disposal of any waste generated by the Corporation, and for which the Department is not responsible, except as may be otherwise provided in this Lease.

(d) For structures at the facility, provide the Department with the Corporation's available radiological/hazardous materials records, available documentation of the configuration of the facility and related systems, available drawings, specifications, procedures, manuals, and available unplanned occurrences records applicable to the facility. For soil, surface water, and groundwater conditions at the facility, provide the Department with the Corporation's available data and reports that describe those conditions and the nature and extent of contamination therein.

(e) Place structures to be returned at the facility in a safe secure condition, removing any immediate threats to human health and safety. Existing radiation monitoring systems shall be in a physical condition adequate to monitor the potential release of any radioactive contamination. The most current radiation contamination/hazardous and toxic material survey done by the Corporation for the facility and surrounding areas shall be provided to the Department.

(f) Provide to the Department a status report of the facility's compliance with environmental, health, and safety regulatory requirements. If the facility is in noncompliance, a strategy for achieving compliance will be developed by the Corporation and provided to the Department.

Section 4.5 Permissible Changes

(a) The Corporation will not demolish or destroy any of the real property which constitutes Leased Premises at a GDP without first proposing such course of action to the Department and obtaining the Department's consent. Such proposal shall contain all the necessary information which the Department may require. Failure of the Department to respond within seven (7) days of receipt of the Corporation's proposal shall be deemed consent by the Department to the proposal. The Department will not withhold its consent to such a proposal if the demolition or destruction is Environmentally Non-Sensitive and does not significantly interfere with the Department's activities at such GDP. If the proposed demolition or destruction is Environmentally Sensitive and does not significantly interfere with the Department's activities, the Corporation will be permitted to carry out the action; provided, however, that the Corporation will be solely responsible for and will pay all the costs related thereto except that the Department shall be solely responsible for and will pay the cost of transporting, storing and disposing of all the material resulting from such demolition or destruc-

tion. The Department will attempt in good faith to store and dispose of all such material at locations other than on the Leased Premises. Any action taken pursuant to this Section by the Department or the Corporation shall be done in accordance with all applicable Laws and Regulations.

(b) The Corporation may, at any time, at its expense, make a Capital Improvement which the Corporation, in its business judgment deems appropriate. The Corporation shall provide the Department with sixty (60) days notice of any proposed Capital Improvement. If the Capital Improvement proposed to be made on the Leased Premises of a GDP requires the expenditure of less than \$250,000, the Corporation will not be required to secure the Department's approval to undertake such Capital Improvement. If the Capital Improvement requires the expenditure of more than such amount, the making of such Capital Improvement shall require the consent of the Department; provided, however, that the Corporation shall be entitled to commence making such Capital Improvement, and consent by the Department will be deemed provided, unless the Department notifies the Corporation within the aforementioned sixty (60) days that the making of such proposed Capital Improvement is Environmentally Sensitive or notifies the Corporation that such proposed Capital Improvement significantly interferes with the Department's activities at the GDP. If the making of the proposed Capital Improvement is Environmentally Sensitive and does not significantly interfere with the Department's activities, the Corporation will be permitted nonetheless to undertake the work; provided however, that the Department shall be solely responsible for and will pay the cost of transporting, storing and disposing of any material resulting from such Capital Improvement. Any action taken by the Department or the Corporation pursuant to this Section shall be done in accordance with all applicable Laws and Regulations.

(c) The Corporation shall become the owner of and shall take title to each and every Capital Improvement. The Corporation will have the right to remove any Capital Improvement; provided, however, that if such removal increases the costs of the Department for the Decontamination and Decommissioning of the Leased Premises to which any such Capital Improvement was attached, the Corporation will pay any such increase in Decontamination and Decommissioning costs. The Corporation and the Department shall agree on the amount of such Decontamination and Decommissioning costs, if any exist, and the time and method of their payment when such Capital Improvement is removed. Title to any Capital Improvement which is not removed by the Corporation shall transfer to the Department at the end of the Lease Term, without the need for the Corporation to take any further action, whether under this Lease or otherwise.

Section 4.6 Decontamination and Decommissioning
Except as provided in Section 4.5(c) of this Lease, the Depart-

ment will be responsible for and will pay the costs of all Decontamination and Decommissioning, including the costs of Decontamination and Decommissioning of the Leased Premises, the Leased Personalty, any personal property found on the Leased Premises, regardless of ownership, and any Capital Improvement. The Department may initiate action for the Decontamination and Decommissioning of property any time property of any kind is returned to the Department by the Corporation pursuant to a provision of this Lease.

Section 4.7 Permits The Secretary will assign and transfer to the Corporation as permitted by applicable Laws and Regulations, at the Corporation's request, those Regulatory Permits held by the Department with respect to the operation of the Leased Premises, including any Regulatory Permits relating to transportation. The Department will use its best efforts to assist the Corporation before any Regulatory Agency in order to effect such transfer. The Corporation will secure, at its expense, all other Regulatory Permits it may require to operate the Leased Premises. The Department will use its best efforts to assist the Corporation in procuring such other Regulatory Permits it requires from any Regulatory Agency.

ARTICLE V ALLOCATION OF LIABILITIES

Section 5.1 In satisfaction of the Department's obligations under Section 1403(d) and Section 1406 of the Act, the Department shall:

(a) provide the Corporation \$35 million in complete satisfaction of all the Department's obligations for any and all modifications to the Leased Premises and the Leased Personalty and other expenses that may be or become necessary for compliance with OSHA standards in effect on and after July 1, 1993;

(b) reimburse the Corporation for:

(i) any work required to bring the Leased Premises and Leased Personalty into compliance with the Nuclear Safety and Safeguards and Security Requirements as such term is defined in the Memorandum of Agreement effective July 1, 1993, between the Department and the Corporation with respect to nuclear safety, safeguards and security ("Regulatory Oversight Agreement") which is attached as Exhibit D, and any amendment thereof, or to achieve any other safety improvements required or directed by the Department; and

(ii) any work required to obtain an initial certificate of compliance from the NRC or NRC

approval of a Department plan for achieving compliance pursuant to Section 1701 of the Act, except to the extent such work is required by conditions attributable to the Corporation's operation of the Leased Premises.

(c) indemnify, reimburse, defend, and hold harmless the Corporation for, and against all costs and expenses related to claims, damages, injunctions, orders, judgments, penalties, and reasonable attorney's fees asserted against or incurred by the Corporation which are attributable to or arising out of the ownership or operation of the Uranium Enrichment Enterprise by the Department (or any contractor, subcontractor, or employee thereof) for:

(i) any pollution, contamination, or threat to human health or the environment attributable to the operation of the Uranium Enrichment Enterprise by the Department, in whole or in part, prior to July 1, 1993, regardless of when the event or condition giving rise to liability is discovered by the Corporation;

(ii) any Environmental Claim against any person or entity whose liability for such Environmental Claim the Department has or may have assumed or retained either contractually or by operation of law;

(iii) the Corporation's status as a permittee, holder, signatory, owner, operator, assign, or successor in relation to any permit, agreement, consent order, or other authorization issued by or reached with any Government Authority, or any administrative or judicial order, decree, or judgment, under authority of or to enforce any Environmental Laws, whereby and to the extent the Corporation is held responsible or liable in any manner for the Department's operation of the Uranium Enrichment Enterprise prior to July 1, 1993 (or any act or failure to act by the Department in transporting, storing, or disposing of any material pursuant to Section 4.5);

(iv) the release, discharge, removal, disposal, change out, or replacement of polychlorinated biphenyls, transuranics, chromates, trichloroethylene, asbestos, or pentachlorophenol existing or present in the GDPs, or any portion thereof, regardless of whether such portion is leased and regardless of the time at which such existence or presence becomes known to the Corporation, except as provided in Section 4.5; provided however, this subsection shall not apply to the extent any such material has been introduced to the Leased Premises by the Corporation. The Department's responsibility under this subsection (iv) shall be gov-

erned by the Laws and Regulations in effect at the time the cost or liability for the release, discharge, removal, disposal, change out or replacement, is incurred by or imposed on the Corporation;

(v) employee pension, welfare and other benefits or liabilities either incurred or accrued prior to July 1, 1993 (whether or not a claim for such benefits or liabilities is asserted before July 1, 1993) under the Transferred Contracts to the extent the Department agreed under such Transferred Contracts to reimburse the contractor for the contractor's employee benefits or liabilities; and

(vi) costs or expenses attributable to or arising out of actions taken or not taken under or pursuant to the Transferred Contracts prior to July 1, 1993, whether based on contract, tort or otherwise, and regardless of whether known or not known by the Corporation to exist on July 1, 1993.

Section 5.2 The Department agrees to indemnify, reimburse, defend, and hold harmless the Corporation for, and against all costs and expenses related to claims, damages, injunctions, orders, judgments, penalties, and reasonable attorney's fees asserted against or incurred by the Corporation which are attributable to or arising out of the Department's operation, occupation or use of the GDPs, or any portion thereof, after July 1, 1993.

Section 5.3 The Corporation agrees to indemnify, reimburse, defend, and hold harmless the Department for, and against all costs and expenses related to claims, damages, injunctions, orders, judgments, penalties, and reasonable attorney's fees asserted against or incurred by the Department which are attributable to or arising out of the operation of the GDPs by the Corporation after July 1, 1993.

Section 5.4 Promptly after receipt by a party entitled to indemnification pursuant to this Article V of notice of the commencement of any action, such indemnified party will, if a claim in respect thereof is to be made against the indemnifying party under this Article V notify the indemnifying party in writing of the commencement thereof. The indemnifying party shall pay all the costs of such litigation, including the related attorney's fees incurred by the indemnified party. The indemnifying party shall be entitled to participate in, and assume, at its own expense, the defense of such litigation.

ARTICLE VI
SUPPORT

Section 6.1 Electric Power Agreement The Department will provide electric power to the Leased Premises in accordance with the Memorandum of Agreement effective July 1, 1993, between the Department and the Corporation which is attached as Exhibit E to this Lease and any amendment thereof ("Electric Power Agreement").

Section 6.2 Services Agreement The Department and the Corporation will provide services to each other in connection with their use of the GDPs in the manner described in the Memorandum of Agreement effective July 1, 1993, between the Department and the Corporation and which is attached as Exhibit F and any amendment thereof ("Services Agreement").

ARTICLE VII
TERM

Section 7.1 Initial Term This Lease will commence on July 1, 1993, and expire on June 30, 1999, unless renewed pursuant to Section 7.2 of this Lease by the Corporation.

Section 7.2 Lease Renewal The Corporation has the exclusive option under Section 1403 of the Act to renew this Lease with respect to either GDP or both GDPs on the same terms and conditions as are contained herein and shall have the right to do so for successive periods beginning on and following July 1, 1999, each period of which may be, at the Corporation's option, for one (1) to six (6) years in length (any such successive period referred to as a "Renewal Period"). If the Corporation chooses to exercise its right to renew this Lease with respect to a GDP, the Corporation will provide the Secretary with notice thereof by July 1, 1997. If the Corporation chooses to exercise its right to renew this Lease with respect to a GDP at the expiration of any Renewal Period, the Corporation will provide the Secretary with notice thereof at least two (2) years prior to the expiration of such Renewal Period.

ARTICLE VIII
RENT

Section 8.1 Lease Payment

(a) For the cost of administering this Lease (including the Electric Power Agreement) and providing regulatory oversight of the GDPs pursuant to the Regulatory Oversight Agreement (all such administration referred to as "Lease Administration"), the Corporation will pay the Department, commencing on July 1,

1993, for each twelve (12) month period of July 1 to June 30 thereafter, until the end of the Lease Term (each such twelve (12) month period of July 1 to June 30 being a "Rent Period" and the period of July 1, 1993 to June 30, 1994 being the "Initial Rent Period") the sum of \$5,195,000, which sum shall be composed of a base rent of \$980,000 ("Base Rent") representing the Department's costs in administering this Lease (including the Electric Power Agreement) in the Initial Rent Period and additional rent of \$4,215,000 ("Additional Rent") representing the Department's costs in providing regulatory oversight of the GDPs pursuant to the Regulatory Oversight Agreement in the Initial Rent Period (The Base Rent and the Additional Rent together being referred to as "Rent"). The Base Rent and the Additional Rent shall be increased or decreased during any Rent Period, as the case may be, by the Department to reflect its actual costs incurred in Lease Administration; provided however that the Corporation shall not be required for any Rent Period to pay the Department more than the Department's actual costs for such Rent Period; and provided further that the Department shall not increase the Base Rent to more than \$1.5 million in any Rent Period without the consent of the Corporation, which consent shall not be unreasonably withheld. The Additional Rent shall be included as a component of the Rent, and be payable by the Corporation, only for as long as the Regulatory Oversight Agreement is in effect.

(b) Rent will be payable monthly in advance on the first day of the month. By June 1 of each year the Department will submit an invoice to the Corporation for its estimated costs of Lease Administration during the following Rent Period. The Department shall determine the actual cost of Lease Administration following the end of such Rental Period and issue an invoice by August 1 of each year which shall reconcile any difference between the estimated and actual costs of Lease Administration in such Rental Period. Such invoice shall provide enough detail for the Corporation to calculate the difference between its monthly payments to the Department and the Department's actual costs in Lease Administration. The Department will grant the Corporation and its accountants such access to the Department's books and records respecting Lease Administration as the Corporation may reasonably require to verify the Department's actual costs associated thereto.

(c) By September 1 of each year, the Corporation shall pay the Department or the Department shall credit the Corporation an appropriate amount which shall reconcile any difference between the amount of Rent paid by the Corporation in the previous Rent Period and the actual costs incurred during the previous Rent Period by the Department for Lease Administration.

(d) Rent payments by the Corporation shall be made to the Department by wire transfer to the Department's headquarters account No. 89-00-0001 at the United States Department of the

Treasury. In the event any Rent payments are more than ten (10) days late, the Corporation will, in addition to such Rent, pay interest on the amount of Rent which is due and owing on that date at the rate per annum equal to the prevailing prime rate of interest set by the Federal Reserve for such day divided by the number of days in the year and for each day thereafter at such rate until the Rent is paid.

Section 8.2 Rent During Renewal Periods The Rent payable by the Corporation pursuant to Section 8.1 of this Lease shall be determined in accordance with Section 8.1 hereof during any Renewal Period.

ARTICLE IX INSURANCE AND DAMAGE

Section 9.1 Corporation Insurance Except for any insurance which the Corporation is required to purchase pursuant to Section 10.1 hereof, the Corporation will not be required to purchase insurance coverage for the Leased Premises or Leased Personalty.

Section 9.2 Partial Casualty to the Leased Premises In the event a part of the Leased Premises are significantly damaged as a result of any foreseen or unforeseen cause or event, whether such cause or event results from action by the Department or by the Corporation or by any other person or entity, regardless of fault and whether insured against or not, then notwithstanding any requirement in Section 4.2(c) in this Lease to maintain such property in good and serviceable condition, the Corporation will have the option, but will not be required, to repair such casualty if, in the Corporation's business judgment, the economic value of repairing such casualty outweighs the cost of the necessary repairs. If the Corporation chooses not to repair such casualty, the Department may, at its expense, repair the casualty; provided, however, that if insurance proceeds are available to the Corporation to pay the cost of repairing such casualty, the Department shall be entitled to use such insurance proceeds for such repair.

Section 9.3 Total Destruction of Leased Premises In the event the Leased Premises pertaining to one of the GDPs are damaged as a result of any foreseen or unforeseen cause or event, whether such cause or event results from action by the Department or by the Corporation or by any other person or entity, regardless of fault and whether insured against or not, to such an extent that, in the business judgment of the Corporation, the damage makes such Leased Premises of the GDP completely unusable by the Corporation, then notwithstanding the requirement in Section 4.2(c) of this Lease to maintain such property in good and serviceable condition, the Corporation will have the option,

upon thirty (30) days notice to the Department, to terminate this Lease with respect to such GDP without the need to take any further action under this Lease or otherwise. Upon such termination the Corporation will return the Leased Premises and Leased Personalty with respect to that GDP to the Department in the condition in which such Leased Premises and Leased Personalty are found on that date. The Corporation will have no obligation to place such Leased Premises and Leased Personalty in any better condition. The Corporation will have an obligation to comply with the Turnover Requirements, but only with respect to facilities which are not destroyed. In the event a termination of this Lease with respect to the Leased Premises of a GDP occurs pursuant to this Section, the Department shall be entitled to any insurance proceeds, if any are available to the Corporation for such casualty, and the Corporation will have the additional obligation, after the termination of this Lease, as a result of such a casualty, to provide funds to the Department to place and maintain the former Leased Premises and Leased Personalty of such GDP in a safe condition with all necessary site surveillance and security until the earlier of either (i) two (2) years following the date of termination under this Section or (ii) when the Department is able to secure the necessary funding for site surveillance and security. The Department will use its best efforts to secure such funding. In the event a termination of this Lease occurs pursuant to this Section with respect to a GDP, Exhibit A and Exhibit B will be amended accordingly to reflect the change.

Section 9.4 Partial Casualty to Leased Personalty In the event Leased Personalty is significantly damaged as a result of any foreseen or unforeseen cause or event, whether such cause or event results from action by the Department or the Corporation or by any other person or entity, regardless of fault and whether insured against or not, then notwithstanding the requirement in Section 4.2(c) of this Lease to maintain such property in good and serviceable condition, the Corporation shall have the option, but will not be required, to repair the casualty if in the Corporation's business judgment the economic value of repairing such damage outweighs the cost of the necessary repairs. If the Corporation chooses not to repair such casualty, the Department may, at its expense, repair the casualty; provided, however, that if insurance proceeds are available to the Corporation to pay the cost of repairing such casualty, the Department shall be entitled to use such insurance proceeds for such repair.

Section 9.5 Total Loss of Leased Personalty In the event an item of Leased Personalty is lost or destroyed as a result of any foreseen or unforeseen cause or event, whether such cause or event results from action by the Department or the Corporation or by any other person or entity, regardless of fault and whether insured against or not, then notwithstanding any requirement in Section 4.2(c) of this Lease to maintain such property in good and serviceable condition, the Corporation shall

have the option, but will not be required, to replace the item of Leased Personalty which has been lost or destroyed. If the Corporation chooses not to replace an item of Leased Personalty which has become lost or destroyed, the Department may, at its expense, replace such Leased Personalty; provided, however, that if insurance proceeds are available to the Corporation to pay the cost of replacing such Leased Personalty, the Department shall be entitled to use such insurance proceeds for such replacement. In the event Leased Personalty is lost or completely destroyed and not replaced, Exhibit B to this Lease will be amended, if necessary, to reflect the change.

Section 9.6 Relationship to Indemnification Nothing contained in this Article IX shall affect the rights of either the Department or the Corporation to indemnification or reimbursement under Article V of this Lease.

ARTICLE X PRICE-ANDERSON INDEMNIFICATION

Section 10.1 Price-Anderson Nuclear Hazards Indemnification by the Department

(a) Authority. This clause is incorporated into this Lease pursuant to the authority contained in subsection 170d. of 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 the Department, the Corporation 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. The Department may, however, at any time require in writing that the Corporation provide and maintain financial protection of such a type and in such amount as the Department shall determine to be appropriate to cover such public liability, provided that the costs of such financial protection are reimbursed to the Corporation by the Department.

(d) Indemnification. (1) To the extent that the Corporation and other persons indemnified are not compensated by any financial protection permitted or required by the Department, the Department will indemnify the Corporation 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 Corporation and other persons indemnified as are approved by the Department, provided that the Department'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 Lease.

(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 Lease, 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) Waiver of Defenses. (1) In the event of a nuclear incident, as defined in the Act, arising out of nuclear waste activities, as defined in the Act, the Corporation, 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 Corporation or a subcontractor of a device utilizing special nuclear material or by-product material, during the course of the Lease activity; or

(iv) arises out of, results from, or occurs in the course of nuclear waste activities, the Corporation, 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 the fault of persons indemnified, including, but not limited to:

1. Negligence;
2. Contributory negligence;
3. Assumption of risk; or

4. Unforeseen 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 damage 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 the Department 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 Department facility, installation, or site at which activity under this Lease is being carried on, and any Corporation-owned or controlled facility, installation, or site at which the Corporation is engaged in the performance of activity under this Lease.

(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 their 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 nuclear incident or extraordinary nuclear occurrence takes place, if benefits therefor are either payable or required to be provided under any workmen's compensation or occupation 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 section 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, or (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 Corporation shall give immediate written notice to the Department of any known action or claim filed or made against the Corporation or other person indemnified for public liability as defined in paragraph (d)(2). Except as otherwise directed by the Department, the Corporation shall furnish promptly to the Department, copies of all pertinent papers received by the Corporation or filed with respect to such actions or claims. The Department shall have the right to, and may collaborate with, the Corporation 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 the Department for the payment of any claim that the Department may be required to indemnify hereunder; and (2) appear through the Attorney General on behalf of the Corporation or other person indemnified in any action brought upon any claim that the Department 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 the Department, the Corporation or other person indemnified shall furnish all reasonable assistance in effecting a settlement or asserting a defense.

(g) Continuity of the Department's obligations. The obligations of the Department under this clause shall not be affected by any failure on the part of the Corporation to fulfill its obligation under this Lease and shall be unaffected by the death, disability, or termination of the existence of the Corporation, or by the completion, termination or expiration of this Lease.

(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 Lease provided, however, that this clause shall be subject to any provisions that are later added to this Lease as required by applicable Federal law, including statutes, executive orders and regulations, to be included in Nuclear Hazards Indemnity Agreements.

(i) Inclusion in contracts. The Corporation shall insert this clause in any contract for the management, operation, design, repair, maintenance, or modification of the GDP 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 contracts in which the person or entity under contract with the Corporation is subject to 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 contract.

(j) Relationship to General Indemnity. To the extent that the Corporation is compensated by any financial protection, or is indemnified pursuant to this clause, or is effectively relieved of public liability by an order or orders limiting same, pursuant to 170e of the Act, the provisions of Article V of this Lease with respect to indemnification of the Corporation shall not apply, but only to such extent.

ARTICLE XI REPRESENTATIVES

Section 11.1 Site Representatives

(a) The Department appoints its Site Manager at each of the GDPs as its representative ("Department Site Manager") with authority to act on behalf of the Department with respect to such GDP in connection with matters related to this

Lease other than modifications of this Lease pursuant to Article XIII hereof. The Department may designate a different Department Site Manager at any time. Within thirty (30) days thereafter, the Department shall provide notice thereof to the Corporation.

(b) The Corporation shall appoint a person at each of the GDPs as its representative ("Corporation Site Manager") with authority to act on behalf of the Corporation with respect to such GDP in connection with matters related to this Lease other than modifications of this Lease pursuant to Article XIII hereof. The Corporation may designate a different Corporation Site Manager at any time. Within thirty (30) days thereafter, the Corporation shall provide notice thereof to the Department.

ARTICLE XII TERMINATION

Section 12.1 Termination for Convenience

The Corporation shall have the right to terminate this Lease, either in its entirety or with respect to one of the GDPs, at its convenience, at any time during the Lease Term (including during any Renewal Period), upon two years notice to the Department, without the need to take any further action under this Lease or otherwise, if in the Corporation's business judgment, such termination is economically necessary. Upon such termination for convenience, the Corporation will return such Leased Premises and Leased Personalty affected by such termination to the Department in the condition in which such Leased Premises and Leased Personalty are found on that date. The Corporation will have no obligation to place such Leased Premises and Leased Personalty in any better condition. Prior to returning such Leased Premises and Leased Personalty to the Department, the Corporation will comply with the Turnover Requirements. In the event this Lease is terminated pursuant to this Section with respect to only one of the GDPs, then Exhibits A and B will be amended accordingly to reflect the change.

ARTICLE XIII MODIFICATIONS AND PRIVATIZATION

Section 13.1 Lease Amendments Except for the changes made pursuant to Section 3.4, Section 3.7, Section 9.3, Section 9.5, Section 11.1, Section 12.1, Section 13.2, Section 15.2 hereof and Appendixes A and B of the Regulatory Oversight Agreement, no change, amendment or modification of this Lease shall be valid or binding unless such change, amendment or modification is described in a writing and is duly executed and consented to by the Secretary and by the Board of Directors of the Corporation, or by any person authorized by them to provide such consent.

Section 13.2 Lease Modifications for Privatization

(a) In the event, a resolution is adopted by the Board of Directors of the Corporation to privatize the Corporation pursuant to the provisions of Section 1502 of the Act, and the President of the United States approves the privatization plan described in Section 1501 of the Act, and the Congress of the United States has been notified of the Corporation's intent to implement such privatization plan in accordance with the Act, this Lease, and any memorandum of agreement between the Department and the Corporation related thereto, will be changed, amended or modified in furtherance of such privatization plan and the mandate which the Act provides for the privatization of the Corporation. The Board of Directors of the Corporation will notify the Secretary promptly after adopting a resolution to privatize the Corporation.

(b) In the event the Corporation is privatized pursuant to Section 1502 of the Act, and all of the duties and obligations of the Corporation are assumed by a private corporation pursuant to such privatization, this Lease and each and every one of its rights and benefits shall survive such privatization and be transferred to such private corporation without the need for the Department or the Corporation to take any further action under this Lease or otherwise. In such event, the name of such private corporation shall be substituted for that of the Corporation in this Lease. In addition, the Department and the Corporation shall take whatever further action is required to transfer to such private corporation any memorandum of agreement or other agreements, instruments or documents related to this Lease and entered into by the Department and the Corporation on or after the date hereof which cannot be transferred to such private corporation by the operation of their terms.

ARTICLE XIV ASSIGNMENTS AND SUBLEASES

Section 14.1 No Assignment; Substitution of Department
The Department shall not have the right to assign this Lease and any such assignment shall be void. The Department may be substituted under this Lease only by a successor agency or department or instrumentality of the United States which assumes all of the duties and obligations of the Department under this Lease.

Section 14.2 No Assignment; Substitution of Corporation
The Corporation shall not have the right to assign this Lease and any such assignment shall be void. The Corporation may be substituted under this Lease only by a successor in interest which assumes all of the duties and obligations of the Corporation under this Lease.

Section 14.3 Subleases

(a) The Corporation may sublease any part or all of the Lease Premises or the Leased Personalty to any person or entity, whether affiliated with the Corporation or otherwise, if the Corporation receives the consent of the Department to such a sublease. The Department shall not unreasonably withhold its consent to any such sublease.

(b) The Corporation shall have the right to operate the Leased Premises of either GDP under this Lease or to engage an operator for such Leased Premises. No contract for the operation of such Leased Premises shall be deemed a sublease.

ARTICLE XV
MISCELLANEOUS

Section 15.1 Entire Lease This Lease contains the entire understanding of the Department and the Corporation with respect to its subject matter. This Lease reflects all agreements and commitments made prior to the date hereof with respect to this Lease by the Department and the Corporation. There are no other oral or written understandings, terms or conditions and neither the Department nor the Corporation has relied upon any representation or statement, express or implied, which is not contained in this Lease.

Section 15.2 Notices In order to be effective, any notice, demand, offer, response, request or other communication made with respect to this Lease by either the Department or the Corporation must be in writing and signed by the one initiating the communication and must be hand-delivered or sent by registered letter, telefax or by a recognized overnight delivery service that requires evidence of receipt at the addresses for such communication given below:

For the Department:

Address:

Fax:

James C. Hall
Assistant Manager for Enriching
Operations, Oak Ridge
U.S. Department of Energy
200 Administration Road
P.O. Box 2001
Oak Ridge, Tennessee 37831
615-576-9686

For the Corporation: General Counsel
Address: United States Enrichment
Corporation
2300 M Street, N.W.
Washington, D.C. 20037
Fax: 202-376-6926

The Department and the Corporation have the right to change the place to which communications are sent or delivered by similar notice sent or delivered. The effective date of any communication shall be the date of the receipt of such communication by the addressee.

Section 15.3 Severability The invalidity of one or more phrases, sentences, clauses, subsections, sections or articles contained in this Lease shall not affect the validity of the remaining portions of this Lease so long as the material purposes of this Lease can be determined and effectuated. If such invalidity alters the fundamental allocation of risks or benefits or the rights and obligations of the Department or the Corporation contemplated in this Lease, the Department and the Corporation will use their best efforts to negotiate in good faith to restructure this Lease to reflect its original purposes.

Section 15.4 No Waiver The failure of either the Department or the Corporation to rely upon any of the provisions of this Lease or to require compliance with any of its terms at any time shall in no way affect the validity of this Lease or any part thereof, and shall not be deemed a waiver of the right of the Department or the Corporation, as the case may be, to rely upon or require compliance with any and each such provision at a different time.

Section 15.5 Applicable Law This Lease will be governed and construed in accordance with the federal laws of the United States of America.

Section 15.6 Binding Nature of Lease This Lease will be binding upon the Department and the Corporation and their respective successors.

Section 15.7 Lease not Joint Venture Nothing contained in this Lease will be construed as creating or establishing a joint venture or partnership between the Department and the Corporation.

Section 15.8 Further Assistance The Department and the Corporation will provide such information, execute and deliver any agreements, instruments and docu-

ments and take such other actions as may be reasonably necessary or required, which are not inconsistent with the provisions in this Lease and which do not involve the assumption of obligations other than those provided for in this Lease, in order to give full effect to this Lease and to carry out its intent and the intent of the Act.

Section 15.9 Licenses

(a) The Department grants to the Corporation for the Lease Term a fully paid, non-transferable, royalty-free sole license in intellectual property which is owned or controlled by the Department or the Department has the right to license in connection with the Uranium Enrichment Enterprise related to the process for enriching uranium by the gaseous diffusion method. Such license shall be for all the activities the Corporation may perform in regard to the Uranium Enrichment Enterprise which are related to the process for enriching uranium by the gaseous diffusion method. The Department's intellectual property subject to such license by the Corporation shall include all patents, unpatented inventions, copyrighted works (including software), and technical data (including drawings, designs and specifications) in connection with the Uranium Enrichment Enterprise that are related to the process for enriching uranium by the gaseous diffusion method.

(b) The Department reserves the right to practice or have practiced for governmental purposes any of its intellectual property licensed to the Corporation.

Section 15.10 Property Records and other Information

(a) The Corporation will keep records of property which constitute the Leased Premises, the Leased Personalty and any Capital Improvement in accordance with the following procedures:

(i) The Corporation shall maintain records of the Leased Premises and Leased Personalty and shall within thirty (30) days of each September 30 prepare and submit to the Department an annual report thereof with respect to the twelve (12) months prior to September 30. Such reports shall consist of a summary description by asset type showing the beginning balance, number of items acquired, fabricated or disposed of during such twelve (12) months and the ending balance. This report will be supported by a detailed listing by

individual unit sorted by asset type and shall identify the location of the Leased Personalty. All such reports may be in terms of gross book value only. Annual reports shall include a listing by facility of all asset type designations, gross book value, net book value, depreciation/amortization method used, service life, and remaining useful life.

(ii) In the event the Corporation makes any Capital Improvement, records shall be maintained by the Corporation for such Capital Improvement such that at the end of the Lease Term property and financial management information with respect thereto can be provided to the Department.

(iii) Inventories of the Leased Premises and Leased Personalty shall be conducted every ten years and at the end of the Lease Term.

(b) Consistent with the Act, and subject to the procedures to be developed by the Department and the Corporation, the Department will provide the Corporation and the Corporation will provide the Department such access as each of them reasonably requires to all technical data, records, papers, documents, computer tapes, designs, drawings and all other information, however stored, regarding the GDPs which is in their possession or control, whether or not such information is classified, restricted or under security.

Section 15.11 Survival Notwithstanding any expiration or conclusion of this Lease or the termination of this Lease, whether pursuant to the terms hereof or otherwise by operation of law, Section 3.3, Section 3.5, Section 4.3, Section 4.4, Section 4.5, Section 4.6, Article V, Section 8.1, Section 9.3, Section 10.1, Section 12.1, Section 15.10, Section 15.13 as well as those portions of any memorandum of agreement between the Department and the Corporation which are related thereto, or by their terms are intended to continue, shall survive any such expiration, conclusion or termination of this Lease.

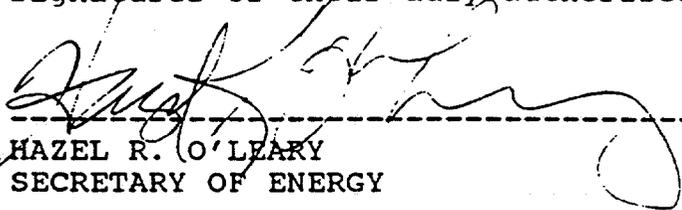
Section 15.12 No Rights in Others This Lease is intended only to improve the internal management of the United States Government. It is not intended to create any right or benefit, substantive or procedural, enforceable by a party against the United States, its agencies or instrumentalities (including the Department

and the Corporation), officers or employees of the United States Government, or any other person.

Section 15.13 Department's Payment Obligations

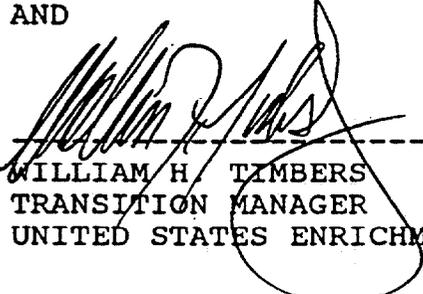
The Department's obligations to make payments under this Lease are subject to the availability of appropriated funds. The Department will use its best efforts, consistent with Laws and Regulations, to make payments from existing appropriations (including by reprogramming funds). If payments cannot be made by the Department from existing appropriations, the Department will use its best efforts to request such additional appropriations as are needed from the Congress of the United States in order to make such payments. This section does not limit either party's rights as provided for in the Act.

IN WITNESS WHEREOF, the Department and the Corporation have caused this Lease to be executed and delivered as of July 1, 1993, and hereby affix the signatures of their duly authorized representatives:



HAZEL R. O'LEARY
SECRETARY OF ENERGY

AND



WILLIAM H. TIMBERS
TRANSITION MANAGER
UNITED STATES ENRICHMENT CORPORATION

EXHIBIT B

LEASED PERSONALTY

as agreed between

UNITED STATES DEPARTMENT OF ENERGY

and

UNITED STATES ENRICHMENT CORPORATION

July 1, 1993

EXHIBIT B

DESCRIPTION OF LEASED PERSONALTY

Section B.1. The Leased Personalty which is being leased by the Corporation pursuant to Section 3.2 of the Lease is all process equipment located on the Leased Premises as of July 1, 1993.

Section B.2. For the purpose of this Exhibit B and Section 3.2 of the Lease, process equipment shall be that equipment categorized as Record Unit No. 735.00 of the Martin Marietta Energy Systems, Inc., Capital Property Record Unit Catalog ("735 - PROCESS EQUIPMENT").

Section B.3. All process equipment located on the Leased Premises includes those items described in that certain computer generated printout, dated June 15, 1993, labeled, "LEASED PERSONALTY."

Section B.4. The computer generated printout described in Section B.3. shall be updated and amended by a subsequent computer generated printout, produced on or before August 31, 1993, which includes all process equipment on the Leased Premises as of July 1, 1993.

Section B.5. The computer generated printout described in Section B.3. and the subsequent computer generated printout described in Section B.4. are hereby incorporated by reference into, and made a part of, this Exhibit B and the Lease.

Section B.6. Leased Personalty also includes the Department's 36-inch underground waterline and associated pumps located in the vicinity of the Tennessee Valley Authority's Shawnee Steam Plant.

APPENDIX A

**Allocation of Sources of Air Emissions
Between Those Controlled by DOE and
Those Controlled by USEC at Paducah
and Portsmouth GDPs**

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(PHONE: 441-5037)**

PADUCAH GASEOUS DIFFUSION PLANT

PERMITTED USEC AND DOE AIR SOURCE LIABILITY LIST

State Emission Point	PGDP Emission Point	Building Location	Affected Facility	USEC Sources	DOE Sources
	97	100	Blueprint production	X	
	98	100	Photography lab	X	
	99	102	X-ray development - medical	X	
	75	200	Document pulverizer	X	
	100	202	Firing range	X	
7	7	310	Gaseous diffusion purge vent	X	
	48	310	Maintenance	X	
	101	310	Datum pumps	X	
	49	315	Maintenance	X	
	50	331	Maintenance	X	
	89	331	Electrical maint. degreaser bucket	X	
	90	331	Instrument shop degreaser	X	
	102	331	Datum pumps	X	
	103	331	Beach-Russ pumps	X	
	104	331	Instrument shop hood	X	
	145	331	Dri-honing cabinet/instrmt shop (720-1)	X	
	51	333	Maintenance	X	
	105	333	Datum pumps	X	
	106	333	Beach-Russ pumps	X	
	52	335	Maintenance	X	
	107	335	Datum pumps (2)	X	
	108	335	Beach-Russ pumps	X	
	53	337	Maintenance	X	
	109	337	Datum pumps (2)	X	
	110	337	Beach-Russ pumps	X	
43	47	340	Remelting uranium alloys		X
	54	360	Maintenance	X	
	24	360	720 Gray Mills Crane shop degreaser	X	
15	15	400	UF4 transfer and pulverizing (#46)		X
	28	400	Vats	X	
29	29	400	Au recovery (#24)		X
38	38	400	Dorex open vapor degreaser (#16)	X	
39	39	400	Blakeslee open vapor degreaser (#23)	X	
41	41	400	Cold cleaning degreaser (72077)		X
	61	400	Nickel deplating vat (#32)	X	
	94	400	Nickel deplating evap. vat (#33)	X	
	95	400	No. 5 dissolver (#26)	X	

State Emission Point	PDDP Emission Point	Building Location	Affected Facility	USEC Sources	DOE Sources
	96	400	No. 4 dimolver (#23)	X	
	111	400	Alkali Vat (#1)	X	
	112	400	Chromic acid vat (#5)	X	
	133	400	Hydrochloric acid vat (#10)	X	
	134	400	Inside nitric acid tank (#30)	X	
	136	400	Hydrofluoric acid/Nitric vat (#8)	X	
	144	400	500 gal inside TCE tank (#17)	X	
	149	400	Vacu-Blast cabinet (#40) (400-1)	X	
	150	400	Vacu-Blast cabinet (#41) (400-2)	X	
	151	400	Hydrochloric acid pickling vat (#9)	X	
	152	400	Trifluoride vat (#3)	X	
	153	400	Aldolase treatment		X
	154	400	Trash bailing and compacting (#35)	X	
	158	400	Decontamination sources	X	
4	4	405	East Incinerator		X
5	5	405	West Incinerator		X
	143	406	10800 gal outside TCE tank (#20)	X	
	135	407	Outside nitric acid tank (#31)	X	
	142	409	High assay Cylinder wash	X	
8	8	410	Fluorine production	X	
	55	410	Maintenance	X	
	137	410	Hydrofluoric acid tank - feed plant		X
	56	420	Maintenance	X	
	57	531	Switchyards - Maint. degreasing	X	
	58	533	Switchyards - Maint. degreasing	X	
	59	533	Switchyards - Maint. degreasing	X	
	60	537	Switchyards - Maint. degreasing	X	
1	2	600	Coal-oil boiler #2	X	
2	3	600	Coal-oil boiler #3	X	
35	35	600	Gas-oil boiler #1	X	
37	37	600	Coal handling operations (a-g)	X	
	130	600	Steam plant fuel storage/601B	X	
	131	600	Steam plant fuel storage/601A	X	
	132	600	Steam plant fuel storage/601D	X	
	37b	600	Fly ash handling	X	
	63	604	Maintenance	X	
42	43	611	Hopper filling	X	
42	44	611	Ferrifloc hopper filling	X	
42	45	611	Soda ash hopper filling	X	

State Emission Point	PODP Emission Point	Building Location	Affected Facility	USEC Sources	DOE Sources
42	46	611	Lime hopper filling	X	
	44	611	Maintenance	X	
42	42	616	Hopper filling	X	
	138	616	Sulfuric acid tanks	X	
	139	616	Sulfuric acid tanks	X	
	140	616	Sulfuric acid tanks	X	
	63	631	Cooling towers	X	
	66	633	Cooling towers	X	
	67	633	Cooling towers	X	
	68	637	Cooling towers	X	
	113	710	Laboratory hoods (avg of 14)	X	
	159	710	Laboratory hoods	X	
40	40	720	Branson open top vapor degreaser		X
	49	720	Maintenance	X	
	77	720	Process motor dip tank	X	
	78	720	West motor bake off oven #1	X	
	79	720	East motor bake off oven #1	X	
	80	720	Motor paint spray booth	X	
	81	720	Seal shop B.C. degreaser	X	
	82	720	Machine shop small B.C. degreaser	X	
	83	720	720 Tool repair shop B.C. degreaser	X	
	85	720	Instrument shop small degreaser	X	
	91	720	Motor shop large B.C. 160°F degreaser with ultrasonic evaporator	X	
	92	720	Motor shop Gray Mills tank	X	
	93	720	Motor shop small B.C. degreaser	X	
	114	720	South welding drop	X	
	115	720	Burn cutting table	X	
	116	720	Seal shop - parts cleaning	X	
	117	720	Seal shop - soldering	X	
	118	720	X-ray development	X	
	119	720	Seal shop - lapping operation	X	
74	120	720	Large burn off oven	X	
75	120	720	120-A Small burn off oven	X	
	121	720	Instrument shop - parts washing	X	
	122	720	Instrument shop - sink hood	X	
	123	720	North welding drop	X	
	124	720	Machine operation	X	
	141	720	720 pump shop B.C. 25 gal degreaser formerly 12 portable Gray Mills tanks	X	
	146	720	Vacu-Blast cabinet/seal shop (720-2)	X	

State Emission Point	PGDP Emission Point	Building Location	Affected Facility	USEC Sources	DOE Sources
	147	720	Vacu-Blast cabinet/pump shop (720-3)	X	
	148	720	Vacu-Blast cabinet/dab shop (720-4)	X	
31	31	724	Paint spray booth	X	
	87	724	Small engine repair degreaser	X	
	128	724	Carpenter shop	X	
32	32	725	Paint spray booth	X	
	139	726	Sandblasting - Black Beauty	X	
	76	728	Motor wash facility	X	
	127	733	Waste storage tanks (4)		X
	70	744	Storage building - lubricants	X	
	88	744	Material handling (degreaser)	X	
	125	744	Valve timing	X	
	73	750	Soil treatment from UST		
	86	750	Garage parts cleaner	X	
71	71	751	Underground gasoline storage tank	X	
71	72	751	Underground diesel storage tank	X	
	163	720-C	New paint shop	X	
26	26	746-A	Al reverberatory furnace		X
27	27	746-A	Al sweating furnace		X
33	33	746-A	Nickel scrap rotary calender		X
34	34	746-A	Induction furnace met. handling		X
36	36	746-A	Induction furnace		X
	126	746-A	Trash baling and compacting	X	
73	162	746-A	Fluorescent lamp crusher		X
	74	746-H	Air sparging decon pad		X
73	161	746-Q	Fluorescent lamp crusher		X
	155	NA	Wet air/seal exhausts	X	
	156	NA	Cylinder valve connection activities	X	
	157	NA	Cylinder valve connection activities not included above	X	
	160	NA	Building ventilation	X	
	NA	NA	Plant wide batteries	X	
	NA	NA	Plant wide fuel storage	X	

PORTSMOUTH GASEOUS DIFFUSION PLANT
 PERMITTED USEC AND DOE AIR SOURCE LIABILITY LIST

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-100	BLUEPRINT MACHINE #15-10829	X		PTO PEND.
X-100	BLUEPRINT MACHINE #15-11516	X		PTO PEND.
X-100	FILM DEVELOPER 11-001198	X		APPL. W/D
X-100	FILM DEVELOPER 11-00202	X		APPL. W/D
X-100	STEAM CONDENSATE TANK	X		PTO PEND.
X-1000	KITCHEN EXHAUST - GRILLS, DEEP FRYERS	X		PTO PEND.
X-1000	KITCHEN EXHAUST - HEATERS	X		APPL. W/D
X-1000	KITCHEN EXHAUST - SERVER LINE	X		APPL. W/D
X-1007	DIESEL GENERATOR	X		PTO PEND.
X-1007	FUEL OIL TANK (T037)	X		EXEMPT
X-102	DISHWASHER EXHAUST	X		APPL. W/D
X-102	HAND DISHWASHING AREA	X		APPL. W/D
X-102	KITCHEN GRILL EXHUAST	X		APPL. W/D
X-1020	EMERGENCY GENERATOR	X		PTO PEND.
X-1020	FUEL OIL TANK	X		PTO PEND.
X-104	EMERGENCY DIESEL GENERATOR (B006)	X		REG
X-104	FUEL OIL TANK (T034)	X		REMOVED
X-104	FUEL OIL TANK (CONVAULT AST) (T093)	X		REG
X-104A	INDOOR FIRING RANGE (P009)	X		REG
X-105	FUME HOOD (R004)	X		REG
X-1107	AV STORAGE TANK	X		REMOVED
X-1107	DV STORAGE TANK	X		PTO PEND.
X-1007E	STORAGE TANK (T041)	X		REMOVED
X-1007F	FUEL OIL TANK (T042)	X		REMOVED
X-300	BATTERY ROOM	X		PTO PEND.

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-300	SCADA BATTERY ROOM (F393)	X		PTI
X-300B	EMERGENCY DIESEL GENERATOR (B007)	X		REG
X-300B	FUEL OIL TANK (T035)	X		REG
X-326	BATTERY ROOM #1	X		PTO PEND.
X-326	BATTERY ROOM #2	X		PTO PEND.
X-326	BATTERY ROOM #3	X		PTO PEND.
X-326	BATTERY ROOM #4		X	PTO PEND.
X-326	BATTERY ROOM #5		X	PTO PEND.
X-326	BATTERY ROOM #6		X	PTO PEND.
X-326	BATTERY ROOM #7		X	PTO PEND.
X-326	BATTERY ROOM #8		X	PTO PEND.
X-326	BATTERY ROOM #9	X		PTO PEND.
X-326	BATTERY ROOM #10	X		PTO PEND.
X-326	DATUM PUMP SYSTEM ACR-4 EXHAUST	X		PTO PEND.
X-326	DATUM PUMP SYSTEM ACR-5 EXHAUST	X		PTO PEND.
X-326	DATUM PUMP SYSTEM ACR-6 EXHAUST	X		PTO PEND.
X-326	DRY AIR PLANT (DAP) DIESEL COMPRESSOR (B016)	X		REG
X-326	DRY AIR PLANT (DAP) FUEL OIL TANK (T006)	X		REG
X-326	EMERGENCY GENERATOR 4-1 (ACR-4) (B012)	X		REG
X-326	EMERGENCY GENERATOR 4-2 (ACR-4) (B013)	X		REG
X-326	EMERGENCY GENERATOR 5-1 (ACR-5) (B010)		X	REG
X-326	EMERGENCY GENERATOR 5-2 (ACR-5) (B011)		X	REG
X-326	EMERGENCY GENERATOR 6-1 (ACR-6) (B008)	X		REG

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-326	EMERGENCY GENERATOR 6-2 (ACR-6) (B009)	X		REG
X-326	FUEL OIL TANK 4-1 (ACR-4) (T019)	X		REG
X-326	FUEL OIL TANK 4-2 (ACR-4) (T020)	X		REG
X-326	FUEL OIL TANK 5-1 (ACR-5) (T017)		X	REG
X-326	FUEL OIL TANK 5-2 (ACR-5) (T018)		X	REG
X-326	FUEL OIL TANK 6 (ACR-6) (T036)	X		REG
X-326	HIGH PRESSURE AIR BLOWOFF	X		PTO PEND.
X-326	LUBE OIL SYSTEM #25-1		X	PTO PEND.
X-326	LUBE OIL SYSTEM #25-2		X	PTO PEND.
X-326	LUBE OIL SYSTEM #25-3		X	PTO PEND.
X-326	LUBE OIL SYSTEM #25-4		X	PTO PEND.
X-326	LUBE OIL SYSTEM #25-5		X	PTO PEND.
X-326	LUBE OIL SYSTEM #25-6	X		PTO PEND.
X-326	LUBE OIL SYSTEM #25-7	X		PTO PEND.
X-326	LUBE OIL SYSTEM #27-1	X		PTO PEND.
X-326	LUBE OIL SYSTEM #27-2	X		PTO PEND.
X-326	LUBE OIL SYSTEM #27-3	X		PTO PEND.
X-326	SEAL EXHAUST SYSTEM (ACR-4)	X		PTO PEND.
X-326	SEAL EXHAUST SYSTEM (ACR-5)		X	PTO PEND.
X-326	SEAL EXHAUST SYSTEM (ACR-6)	X		PTO PEND.
X-326	SECURITY BATTERY BANK 111A (P391)		X	PTI
X-326	SECURITY BATTERY BANK 111B (P392)		X	PTI
X-326	SECURITY FUEL OIL TANK NORTH (ACR-4) (T015)		X	REG
X-326	SECURITY FUEL OIL TANK SOUTH (ACR-6) (T016)		X	REG
X-326	SECURITY GENERATOR NORTH (ACR-4) (B014)		X	REG
X-326	SECURITY GENERATOR SOUTH (ACR-6) (B015)		X	REG

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-326	SIDE PURGE	X		PTO PEND.
X-326	TOP SURGE	X		PTO PEND.
X-330	AREA 2 NORTH & SOUTH DATUM EXHAUST PUMPS	X		PTO PEND.
X-330	AREA 3 NORTH & SOUTH DATUM EXHAUST PUMPS	X		PTO PEND.
X-300	BATTERY ROOM #1	X		PTO PEND.
X-330	BATTERY ROOM #2	X		PTO PEND.
X-330	BATTERY ROOM #3	X		PTO PEND.
X-330	BATTERY ROOM #4	X		PTO PEND.
X-330	BATTERY ROOM #5	X		PTO PEND.
X-330	BATTERY ROOM #6	X		PTO PEND.
X-330	BATTERY ROOM #7	X		PTO PEND.
X-330	BATTERY ROOM #8	X		PTO PEND.
X-330	BATTERY ROOM #9	X		PTO PEND.
X-330	BATTERY ROOM #10	X		PTO PEND.
X-330	BATTERY ROOM #11	X		PTO PEND.
X-330	COLD RECOVERY ROOM EXHAUST	X		PTO PEND.
X-330	COLD RECOVER/BLDG. WET AIR EVACUATION VENT	X		PTO PEND.
X-330	CONDITIONING GAS ROOM EXHAUST	X		PTO PEND.
X-330	DRY AIR PLANT (DAP) FUEL OIL TANK (T007)	X		REG
X-330	DRY AIR PLANT EMERGENCY DIESEL COMPRESSOR (B022)	X		REG
X-330	EMERGENCY GENERATOR 2-1 (ACR-2) (B019)	X		REG
X-330	EMERGENCY GENERATOR 2-2 (ACR-2) (B020)	X		REG
X-330	EMERGENCY GENERATOR 2-3 (ACR-3) (B021)	X		REG

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-330	EMERGENCY GENERATOR 3-1 (ACR-3) (B017)	X		REG
X-330	EMERGENCY GENERATOR 3-2 (ACR-3) (B018)	X		REG
X-330	FUEL OIL TANK 2-1 (ACR-2) (T023)	X		REG
X-330	FUEL OIL TANK 2-2 (ACR-2) (T024)	X		REG
X-330	FUEL OIL TANK 2-3 (ACR-3) (T025)	X		REG
X-330	FUEL OIL TANK 3-1 (ACR-3) (T021)	X		REG
X-330	FUEL OIL TANK 3-2 (ACR-3) (T022)	X		REG
X-330	LUBE OIL SYSTEM #29-1	X		PTO PEND.
X-330	LUBE OIL SYSTEM #29-2	X		PTO PEND.
X-330	LUBE OIL SYSTEM #29-3	X		PTO PEND.
X-330	LUBE OIL SYSTEM #29-4	X		PTO PEND.
X-330	LUBE OIL SYSTEM #29-5	X		PTO PEND.
X-330	LUBE OIL SYSTEM #29-6	X		PTO PEND.
X-330	LUBE OIL SYSTEM #31-1	X		PTO PEND.
X-330	LUBE OIL SYSTEM #31-2	X		PTO PEND.
X-330	LUBE OIL SYSTEM #31-3	X		PTO PEND.
X-330	LUBE OIL SYSTEM #31-4	X		PTO PEND.
X-330	LUBE OIL SYSTEM #31-5	X		PTO PEND.
X-330	NITROGEN CLOUMN COLD BOX	X		APPL. W/D
X-330	NORTH CONDENSATE SYSTEM	X		APPL. W/D
X-330	PROCESS LUBE OIL TANK	X		PTO PEND.
X-330	SEAL EXHAUST SYSTEM (ACR-2)	X		PTO PEND.
X-330	SEAL EXHAUST SYSTEM (ACR-3)	X		PTO PEND.
X-330	SOUTH CONDENSATE SYSTEM	X		APPL. W/D
X-330	TAILS WITHDRAWAL ROOM EXHAUST	X		PTO PEND.
X-333	BATTERY ROOM #1	X		PTO PEND.
X-333	BATTERY ROOM #2	X		PTO PEND.
X-333	BATTERY ROOM #3	X		PTO PEND.

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOB SOURCES	STATUS
X-333	BATTERY ROOM #4	X		PTO PEND.
X-333	BATTERY ROOM #5	X		PTO PEND.
X-333	BATTERY ROOM #6	X		PTO PEND.
X-333	BATTERY ROOM #7	X		PTO PEND.
X-333	BATTERY ROOM #8	X		PTO PEND.
X-333	BUILDING WET AIR EVACUATION VENT	X		PTO PEND.
X-333	COLD RECOVERY ROOM EXHAUST	X		APPL. W/D
X-333	COLD RECOVERY VENT	X		PTO PEND.
X-333	CONDITIONING AGENT ROOM EXHAUST	X		PTO PEND.
X-333	DATUM PUMP SYSTEM EXHAUST	X		PTO PEND.
X-333	EMERGENCY GENERATOR 33-1 (ACR-1) (B023)	X		REG
X-333	EMERGENCY GENERATOR 33-2 (ACR-1) (B024)	X		REG
X-333	EMERGENCY GENERATOR 33-3 (ACR-1) (B025)	X		REG
X-333	EMERGENCY GENERATOR 33-4 (ACR-1) (B026)	X		REG
X-333	FUEL OIL TANK 33-1 (ACR-1) (T026)	X		REG
X-333	FUEL OIL TANK 33-2 (ACR-1) (T027)	X		REG
X-333	FUEL OIL TANK 33-3 (ACR-1) (T028)	X		REG
X-333	FUEL OIL TANK 33-4 (ACR-1) (T029)	X		REG
X-333	LOW ASSAY WITHDRAWAL	X		PTO PEND.
X-333	LUBE OIL SYSTEM 1	X		PTO PEND.
X-333	LUBE OIL SYSTEM 2	X		PTO PEND.
X-333	LUBE OIL SYSTEM 3	X		PTO PEND.
X-333	LUBE OIL SYSTEM 4	X		PTO PEND.
X-333	LUBE OIL SYSTEM 5	X		PTO PEND.
X-333	LUBE OIL SYSTEM 6	X		PTO PEND.
X-333	LUBE OIL SYSTEM 7	X		PTO PEND.

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-333	LUBE OIL SYSTEM 8	X		PTO PEND.
X-333	SEAL EXHAUST SYSTEM (ACR-1)	X		PTO PEND.
X-334	KEROSENE STORAGE TANK T-1 (CLEANING & STORAGE) (T003)	X		REG
X-334	PCB OIL STORAGE TANK T-2 (T004)	X		REG
X-334	WASTE KEROSENE STORAGE TANK T-3 (T005)	X		REG
X-342A	AUTOCLAVE BLOWDOWN	X		APPL. W/D
X-342A	AUTOCLAVE MOTOR BUFFER	X		APPL. W/D
X-342A	AUTOCLAVE PRESSURE RELIEF VALVE	X		APPL. W/D
X-342A	FLUORINE PURGE VENT	X		PTO PEND.
X-342A	HF PURGE VENT	X		PTO PEND.
X-342A	HF VAPORIZOR SAFETY RELIEF VALVE	X		APPL. W/D
X-342A	HYDROGEN VENT #1	X		PTO PEND.
X-342A	HYDROGEN VENT #2	X		PTO PEND.
X-342A	SODIUM FLUORIDE REGENERATION	X		PTO PEND.
X-342B	FLUORINE EVACUATION JET #1	X		PTO PEND.
X-342B	FLUORINE EVACUATION JET #2	X		PTO PEND.
X-342B	FLUORINE SAFETY RELIEF EXHAUST	X		APPL. W/D
X-343	AUTOCLAVE BLOWDOWN	X		APPL. W/D
X-343	AUTOCLAVE SAFETY RELIEF EXHAUST	X		APPL. W/D
X-344	TOLL TRANSFER FACILITY (GULPER)	X		PTO PEND.
X-344A	AUTOCLAVE STEAM BLOWDOWN	X		APPL. W/D
X-344A	AUTOCLAVE STEAM BLOWDOWN	X		PTO PEND.
X-344A	EMERGENCY GENERATOR (B027)	X		REG
X-344A	SECURITY FUEL OIL TANK (T030)	X		REG
X-344B	HAZARDOUS CHEMICAL STORAGE ROOM	X		APPL. W/D
X-344E	HF TANK PURGE AND PIPING PURGE	X		INACTIVE
X-344E	HF TANK SAFETY RELIEF VALVE	X		APPL. W/D

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-345	EMERGENCY GENERATOR (B028)		X	REG
X-345	EMERGENCY ROOM PURGE		X	APPL W/D
X-345	HIGH ASSAY SAMPLING AREA (HASA)		X	PTO PEND.
X-345	LAB FUME HOOD		X	PTO PEND.
X-345	SAMPLING GLOVE BOX VENT		X	PTO PEND.
X-345	SECURITY FUEL OIL TANK (T031)		X	REG
X-5000	BATTERY ROOM (P394)	X		PTI
X-5001	345 KV OIL TANK	X		PTO PEND.
X-530	BATTERY ROOM #1	X		PTO PEND.
X-530	BATTERY ROOM #2	X		PTO PEND.
X-530	POWER FACTOR COMPENSATOR	X		PTO PEND.
X-530D	345 KV OIL TANK	X		PTO PEND.
X-530D	CLEAN OCB AND TAP CHANGE OIL TANK	X		PTO PEND.
X-530D	CLEAN TRANSFORMER OIL TANK	X		PTO PEND.
X-530D	CONTAMINATED OCB AND TAP CHANGE OIL TANK	X		PTO PEND.
X-530D	CONTAMINATED TRANSFORMER OIL TANK	X		PTO PEND.
X-530D	OIL HOUSE	X		PTO PEND.
X-533	BATTERY ROOM #1	X		PTO PEND.
X-533	BATTERY ROOM #2	X		PTO PEND.
X-533	POWER FACTOR COMPENSATOR	X		PTO PEND.
X-533D	CLEAN OCB AND TAP CHANGE OIL TANK	X		PTO PEND.
X-533D	CONTAMINATED OCB AND TAP CHANGE OIL TANK	X		PTO PEND.
X-533D	OIL HOUSE	X		PTO PEND.
X-533D	OIL TRANSFORMER OIL TANK (CLEAN)	X		PTO PEND.
X-533D	OIL TRANSFORMER OIL TANK (CONTAMINATED)	X		PTO PEND.
X-533H	SF6 ROOM EXHAUST VENTS	X		APPL W/D

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-600	ACID TANK (T045)	X		EXEMPT
X-600	ASH RECEIVERS #1 AND #2	X		PTO PEND.
X-600	BOILER GUARD TANK #1	X		PTO PEND.
X-600	BOILER GUARD TANK #2	X		PTO PEND.
X-600	BOILER GUARD TANK #3	X		PTO PEND.
X-600	BOILER NO. 1 (SOUTH) (B001)	X		PTO
X-600	BOILER NO. 2 (MIDDLE) (B002)	X		PTO
X-600	BOILER NO. 3 (NORTH) (B003)	X		PTO
X-600	CAUSTIC/SULFIDE FEED TANK	X		PTO PEND.
X-600	DEAERATOR	X		PTO PEND.
X-600	FL-160 FEED TANK	X		PTO PEND.
X-600	FLASH TANK	X		PTO PEND.
X-600	STEAM PLANT DEGASIFIER	X		PTO PEND.
X-6000	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-6000	COMPRESSOR AIR BLOWOFF A	X		APPL. W/D
X-6000	COMPRESSOR AIR BLOWOFF B	X		APPL. W/D
X-6000	COMPRESSOR AIR BLOWOFF C	X		APPL. W/D
X-6000	EMERGENCY GENERATOR	X		PTO PEND.
X-6000	GEAR BOX OIL VENT A	X		PTO PEND.
X-6000	GEAR BOX OIL VENT B	X		PTO PEND.
X-6000	GEAR BOX OIL VENT C	X		PTO PEND.
X-6000	HYDRIER A AIR VENT	X		APPL. W/D
X-6000	HYDRIER B AIR VENT	X		APPL. W/D
X-6000	HYDRIER C AIR VENT	X		APPL. W/D
X-6000	LARGE CHROMATE TANK	X		INACTIVE
X-6000	LARGE FUEL TANK	X		PTO PEND.
X-6000	SMALL CHROMATE (OROCOL) TANK	X		INACTIVE
X-6000	SMALL FUEL OIL TANK #1	X		PTO PEND.
X-6000	SMALL FUEL OIL TANK #2	X		PTO PEND.

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-6000	SMALL FUEL OIL TANK #3	X		PTO PEND.
X-6000	SULFURIC ACID DAY TANK (T052)	X		EXEMPT
X-6000	SULFURIC ACID TANK - LARGE (T053)	X		EXEMPT
X-6001	COOLING TOWER (P387)	X		REG
X-605	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-605	EMERGENCY GENERATOR (B030)	X		PTO PEND.
X-605	FUEL OIL TANK (T008)	X		PTO PEND.
X-605J	EMERGENCY GENERATOR (B029)	X		PTO PEND.
X-608	BATTERY ROOM EXHAUST	X		PTO PEND.
X-608	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-611	BATTERY ROOM	X		PTO PEND.
X-611	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-611	FUEL OIL TANK (T009)	X		REG
X-611	LIME CONVEYOR BAG HOUSE (EAST)	X		PTO PEND.
X-611	LIME CONVEYOR BAG HOUSE (ON SILO)	X		PTO PEND.
X-611	LIME CONVEYOR BAG HOUSE (WEST)	X		PTO PEND.
X-611	OIL FIRED BOILER (B004)	X		REG
X-611C	EMERGENCY DIESEL PUMP #1 (B031)	X		REG
X-611C	EMERGENCY DIESEL PUMP #2 (B032)	X		REG
X-611C	FUEL OIL TANK (T010)	X		REG
X-611D	RECARBONATION ROOM VENT	X		APPL. W/D
X-611D	RECARBONATION TANK	X		PTO PEND.
X-616	CHROMATE TREATMENT FACILITY	X		INACTIVE
X-616	LIME STORAGE SILO	X		APPL. W/D
X-616	SO2 ROOM EXHAUST	X		APPL. W/D
X-617	CAUSTIC TANK	X		PTO PEND.
X-621	CAUSTIC TANK	X		PTO PEND.
X-622	GROUNDWATER TREATMENT FACILITY		X	EXEMPT

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-623	GROUNDWATER TREATMENT FACILITY (P433)		X	PTI
X-624	GROUNDWATER TREATMENT FACILITY (P435)		X	PTI
X-626	ACID TANK (T056)	X		EXEMPT
X-626	BATTERY ROOM EXHAUST	X		PTO PEND.
X-626	BETZ 2020 STORAGE TANK (T057)	X		EXEMPT
X-626	BETZ 20K STORAGE TANK (T058)	X		EXEMPT
X-626	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-7626	COOLING TOWERS (INCL. X-630 & X-633)	X		PTO PEND.
X-630	ACID TANK (600 GAL) (T059)	X		EXEMPT
X-630	BATTERY ROOM EXHAUST	x		PTO PEND.
X-630	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-630-1	BETZ 10K TANK (T060)	X		EXEMPT
X-630-3	NORTH ACID STORAGE TANK	X		PTO PEND.
X-630-3	SMALL ACID STORAGE TANK	X		PTO PEND.
X-630-3	SOUTH ACID STORAGE TANK	X		PTO PEND.
X-633	ACID STORAGE TANK	X		PTO PEND.
X-633	BATTERY ROOM EXHAUST	X		PTO PEND.
X-633	BETZ 10K STORAGE TANK (T062)	X		EXEMPT
X-633	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-640-1	EMERGENCY DIESEL PUMP (B033)	X		REG
X-640-1	FUEL OIL TANK (T011)	X		REG
X-6619	CHLORINE ROOM EXHAUST	X		APPL. W/D
X-6644	FIRE WATER PUMP DIESEL ENGINE	X		PTO PEND.
X-6644	FIRE WATER PUMP FUEL TANK	X		PTO PEND.
X-6644	SANITARY WATER PUMP DIESEL ENGINE	X		PTO PEND.
X-6644	SANITARY WATER PUMP FUEL TANK	X		PTO PEND.
X-700	ACID NICKEL STRIPPING EXHAUST	X		PTO PEND.
X-700	BIODENITRIFICATION VENT #1	X		PTO PEND.

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-700	BIODENTRIFICATION VENT #2	X		PTO PEND.
X-700	BIODENTRIFICATION VENT #3	X		PTO PEND.
X-700	CHEMICAL CLEANING AND DEGREASING TANKS	X		PTO PEND.
X-700	CONVERTER COOLER DRYER	X		APPL. W/D
X-700	CONVERTER PURGE STATION A	X		PTO PEND.
X-700	CONVERTER PURGE STATION B	X		PTO PEND.
X-700	DIP TANKS	X		PTO PEND.
X-700	NITRIC ACID TANK	X		PTO PEND.
X-700	RAD CAL LAB FUME HOOD	X		PTO PEND.
X-700	SOLVENT CONTAMINATED WATER TREATMENT SYSTEM (P010)		X	PTO
X-700	TRICHLOROETHYLENE TANK	X		PTO PEND.
X-700	VAPOR DEGREASER (L005)	X		PTO INACTIVE
X-700	WELDER STATION A-4	X		PTO PEND.
X-700	WELDER STATION B-2	X		PTO PEND.
X-700	WELDER STATION C-4	X		PTO PEND.
X-700	WELDER STATION D-1	X		PTO PEND.
X-700	WELDER STATION D-11	X		PTO PEND.
X-700	WELDER STATION D-3	X		PTO PEND.
X-700	WELDER STATION D-8	X		PTO PEND.
X-705	ACID CLEANING HANDTABLE	X		PTO PEND.
X-705	CALCINER A, SOUTH, ROTARY (P002)	X		REG. REMOVED
X-705	CALCINER B, MIDDLE, ROTARY (P003)	X		REG. REMOVED
X-705	CALCINER C, NORTH, ROTARY (P004)	X		REG. REMOVED
X-705	CALCINER EXHAUST	X		PTO PEND.
X-705	CALCINER, ELECTRIC (F-AREA) (P001)	X		REG. INACTIVE

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-705	CAUSTIC PRECIPITATION ENCLOSURE EXHAUST	X		INACTIVE
X-705	CYLINDER CLEANING COLUMN VENT	X		PTO PEND.
X-705	DISMANTLING ROOM VENT	X		PTO PEND.
X-705	FUME HOOD	X		PTO PEND.
X-705	GREASY PARTS CLEANING HANDTABLE	X		PTO PEND.
X-705	HEAVY METALS MIX TANK VENT	X		PTO PEND.
X-705	HIGH ASSAY PARTS CLEANER (A-AREA)	X		PTO PEND.
X-705	ION EXCHANGE COLUMN VENT	X		PTO PEND.
X-705	NORTH SPRAY TANK	X		PTO PEND.
X-705	OXIDE CONVERSION REACTOR (E-AREA) (P005)	X		REG. INACTIVE
X-705	PIT HANDTABLE (A-AREA)	X		PTO PEND.
X-705	SOUTH ANNEX DECONTAMINATION EXHAUST	X		PTO PEND.
X-705	SOUTH SPRAY TANK	X		PTO PEND.
X-705	TUNNEL BOOTH EXHAUSTS	X		PTO PEND.
X-705	URANIUM BLENDING AND SAMPLING GLOVE BOX	X		PTO PEND.
X-705	URANIUM SOLUTION STORAGE VENT	X		PTO PEND.
X-710	EMERGENCY GENERATOR (B034)	X		REG
X-710	FUEL OIL TANK (T032)	X		REG
X-710	LAB HOODS (192 HOODS)	X		PTO PEND.
X-720	BOP AREA	X		PTO PEND.
X-720	CARPENTER SHOP SAWDUST EXHAUST SYSTEM	X		PTO PEND.
X-720	COMPRESSOR SHOP VAPOR DEGREASER (L002)	X		PTO
X-720	CYLINDER REPAIR AREA EXHAUST	X		PTO PEND.
X-720	GRINDER # COLUMN G-1	X		APPL W/D
X-720	GRIT BLASTING ROOM	X		PTO PEND.

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-720	INSTRUMENT CLEANING ROOM HOOD #1	X		PTO PEND.
X-720	INSTRUMENT CLEANING ROOM HOOD #3	X		PTO PEND.
X-720	INSTRUMENT CLEANING ROOM HOOD #4	X		PTO PEND.
X-720	INSTRUMENT SHOP DEGREASER (L003)	X		REG
X-720	MEATLIZED PARTS EQUIPMENT	X		PTO PEND.
X-720	METALIZING SPRAY AREA	X		PTO PEND.
X-720	MOTOR SHOP BAKE OVEN (R003)	X		REG
X-720	MOTOR SHOP PBURN-OFF OVEN (P018)	X		PTO
X-720	MOTOR SHOP FUEL OIL TANK (NORTH DIESEL TANK) (T012)	X		REG
X-720	MOTOR SHOP PAINT BOOTH (R005)	X		REG
X-720	MOTOR SHOP VAPOR DEGREASER (L001)	X		PTO INACTIVE
X-720	PAINT SHOP CLEANING ROOM (3 VENTS)	X		PTO PEND.
X-720	PAINT SHOP SPRAY BOOTH (R001)	X		REG
X-720	ROOM VENTILATION	X		PTO PEND.
X-720	SAMPLE BOTTLE EXHAUST, INST. ROOM	X		PTO PEND.
X-720	SATELLITE WELDING AREA	X		PTO PEND.
X-720	SEAL SHOP ACID BATH	X		PTO PEND.
X-720	SEAL SHOP DEGREASER (L006)	X		REG
X-720	SEAL SHOP HOT WATER BATH	X		PTO PEND.
X-720	SEAL SHOP INDUCTION HEATER	X		PTO PEND.
X-720	SEAL SHOP LAPMASTER	X		PTO PEND.
X-720	SPECTROMETER ROOM HOOD	X		PTO PEND.
X-720	STEAM CLEANING BOOTH	X		PTO PEND.
X-720	TOXIC LOCKER	X		PTO PEND.
X-720	TRICHLOROETHYLENE TANK - NORTH	X		INACTIVE
X-720	TRICHLOROETHYLENE TANK - SOUTH	X		INACTIVE

BUILDING	DESCRIPTION (OEPA SOURCE NUMBER)	USEC SOURCES	DOE SOURCES	STATUS
X-720	UTILITIES SHOP DEGREASER (L004)	X		REG
X-735	REFUSE/ASBESTOS HANDLING (F001)		X	PTO
X-735	ROADS/PARKING AREAS LANDFILL (F002)		X	PTO
X-735A	FUEL OIL TANK (T033)		X	REG
X-744G	ALUMINUM MELTER (P007)		X	REG. INACTIVE
X-744G	FUEL OIL TANK (EAST) (T014)		X	REG. INACTIVE
X-744G	FUEL OIL TANK (SOUTH) (T013)		X	REG
X-744G	GLOVE BOX		X	PTO PEND.
X-744G	OIL FIRED FURNACE (B005)		X	REG
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (P390)		X	PTI
X-750	DIESEL STORAGE TANK (T002)	X		REG. REMOVED
X-750	ENGINE EXHAUST VENTILATION SYSTEM	X		PTO PEND.
X-750	GASOLINE STORAGE TANK (T001)	X		REG. REMOVED
X-750	SERVICE STATION (GASOLINE & DIESEL TANKS) (G001)	X		PTI
X-750	USED OIL TANK	X		PTO PEND.
X-760	NORTH AND SOUTH FUME HOODS FACILITY (P390)	X		PTO PEND.

APPENDIX B

**Waste Water Streams Resulting
From DOE's Continuing Operations at the
Paducah and Portsmouth GDPs**

**PADUCAH GASEOUS DIFFUSION PLANT
KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM (KPDES)
OUTFALLS**

KPDES PROCESS WATER OUTFALLS - USEC

- 001 - C-616 Chromium Reduction Facility
- 002 - C-337 Cascade Building
- 003 - North/South Diversion Ditch
- 004 - C-615 Sewage Treatment Plant
- 005 - C-611 Water Treatment Backwash
- 006 - C-611 Water Treatment Backwash
- 008 - C-744, C-600, C-409, C-615 Effluents, etc.
- 009 - C-810/811 Parking, C-720, etc.
- 010 - C-531 and C-331 Effluents, etc.
- 011 - C-333 Cascade Bldg. (Combination of Outfall 002, 010, 011, and 012)
- 012 - C-633 Pumphouse, C-533 Switchyard, etc.
- 014 - C-611 Water Treatment Backwash

SURFACE RUNOFF FROM USEC PROPERTY - USEC

- 013 - Surface Runoff from SE Part of Plant
- 015 - Surface Runoff from W Part of Plant
- 016 - Surface Runoff from SW Part of Plant

INACTIVE OUTFALLS - DOE

- 007 - C-611 Water Treatment Plant/Septic System

SURFACE RUNOFF FROM DOE/ER PROPERTY - DOE

- 017 - Surface Runoff from Tail Cylinder Storage Area
- 018 - Surface Runoff from Waste Landfill Area

PORTSMOUTH GASEOUS DIFFUSION PLANT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
OUTFALLS

NPDES PROCESS WATER OUTFALLS - USEC

- 001 - East Drainage Ditch X-230J7 Pond
- 002 - South Holding Pond X-230K
- 003 - X-6619 Sewage Treatment Facility
- 004 - X-616 Chromium Treatment Facility
- 005 - X-611B Lime Sludge Lagoon
- 009 - North Holding Pond X-230L
- 010 - West Drainage Ditch X-230J5 Pond
- 011 - North West Drainage Ditch X-230J6 Pond
- 602 - X-621 Coal Pile Treatment Facility
- 604 - Bionitrification Facility X-700
- 605 - X-705 Waste Treatment Facility (Microfiltration)

SURFACE RUNOFF FROM DOE/ER PROPERTY - DOE

- 012 - X-2230M Holding Pond (Southwest GCEP)
- 013 - X-2230N Holding Pond (West GCEP)
- 014 - Culvert (South GCEP) Storm Runoff Only Monitor

NPDES PROCESS WATER OUTFALLS - DOE

- 006 - X-611A North Lime Sludge Lagoon
- 007 - X-611A Middle Lime Sludge Lagoon
- 008 - X-611A South Lime Sludge Lagoon

GROUNDWATER TREATMENT FACILITIES - DOE

- 606 - 701B Carbon Filtration Facility
- 607 - Groundwater Treatment Facility (X-700 Air Stripper)
- 608 - X-622 Carbon Filtration
- 609 - Groundwater Carbon Filtration (Portable) Plume Intercept

EXHIBIT A

LEASED PREMISES

as agreed between

UNITED STATES DEPARTMENT OF ENERGY

and

UNITED STATES ENRICHMENT CORPORATION

July 1, 1993

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-100	ADMINISTRATION BUILDING
C-100-A	OFFICE TRAILER
C-100-T-04	TEMPORARY OFFICE
C-100-T-05	TEMPORARY OFFICE
C-100-T-06	TEMPORARY OFFICE
C-101	CAFETERIA
C-102	HOSPITAL
C-102-T-01	TEMPORARY OFFICE
C-102-T-02	TEMPORARY OFFICE
C-102-T-03	TEMPORARY OFFICE
C-102-T-04	TEMPORARY OFFICE
C-102-T-05	TEMPORARY OFFICE
C-102-T-06	TEMPORARY OFFICE
C-200	GUARD AND FIRE HEADQUARTERS
C-200-A	SECURITY PATROL & FIRE TRAINING
C-201	EMERGENCY EQUIPMENT STORAGE BUILDING
C-201-A	EMERGENCY EQUIPMENT STORAGE BUILDING
C-201-B	EMERGENCY EQUIPMENT STORAGE BUILDING
C-201-C	EMERGENCY EQUIPMENT STORAGE BUILDING
C-202	GUARD TRAINING BUILDING
C-203	EMERGENCY VEHICLE SHELTER
C-206	PUMPER DRAFTER PIT
C-206-A	STORAGE TRAILER
C-206-B	SMOKE TRAINING FACILITY
C-212	OFFICE BUILDING
C-212-A	MAIN GUARD POST (GATE 15)
C-215	PORTALS 18 AND 19
C-216	POST 47

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-217	POST 43
C-300	CENTRAL CONTROL BUILDING
C-300-531	INSTRUMENTATION TUNNEL
C-300-533	INSTRUMENTATION TUNNEL
C-300-535	INSTRUMENTATION TUNNEL
C-300-537	INSTRUMENTATION TUNNEL
C-302	OPERATIONS DIVISION DATA CENTER
C-303	SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS BUILDING
C-304	TRAINING AND CASCADE OFFICE BUILDING
C-310	PURGE AND PRODUCT BUILDING
C-310-331	ENCLOSED BRIDGE
C-310-410	TIE LINE
C-310-A	PRODUCT WITHDRAWAL BUILDING
C-315	SURGE AND WASTE BUILDING
C-315-331	TIE LINE
C-320	COMMUNICATION BUILDING
C-331	PROCESS BUILDING
C-331-333	ENCLOSED BRIDGE
C-331-333	TIE LINE
C-331-335	TIE LINE
C-331-410	TIE LINE
C-333	PROCESS BUILDING
C-333-A	FEED VAPORIZATION FACILITY
C-335	PROCESS BUILDING
C-335-337	ENCLOSED BRIDGE
C-335-337	TIE LINE
C-337	PROCESS BUILDING
C-337-A	FEED VAPORIZATION FACILITY

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-342	AMMONIA DISSOCIATOR AND STORAGE FACILITY
C-342-A	AMMONIA DISSOCIATOR ADDITION
C-350	DRYING AGENT STORAGE BUILDING
C-360	TOLL TRANSFER AND SAMPLING BUILDING
C-375-E2	OIL CONTROL DAM(EAST DRAINAGE DITCH) KPDES 002
C-375-E3	OIL CONTROL DAM(EAST DRAINAGE DITCH) KPDES 010
C-375-E4	OIL CONTROL DAM(EAST DRAINAGE DITCH) KPDES 011
C-375-E5	OIL CONTROL DAM(EAST DRAINAGE DITCH) KPDES 012
C-375-N1	OIL CONTROL DAM KPDES 003
C-375-S6	OIL CONTROL DAM(SOUTH DRAINAGE DITCH) KPDES 009
C-375-W7	OIL CONTROL DAM(WEST DRAINAGE DITCH) KPDES 008
C-375-W8	OIL CONTROL DAM(WEST DRAINAGE DITCH) KPDES 015
C-375-W9	OIL CONTROL DAM(WEST DRAINAGE DITCH) KPDES 001
C-400	CLEANING BUILDING AND APPURTENANT STRUCTURES
C-400-A	EMERGENCY POWER FOR CRITICAL ALARMS
C-406	TRICHLOROETHYLENE STORAGE TANK
C-407	NITRIC ACID STORAGE TANK
C-408	50-TON TRUCK SCALE
C-409	STABILIZATION BUILDING
C-409-A	STORAGE TRAILER
C-409-B	STORAGE TRAILER
C-410	FEED PLANT AND APPURTENANT STRUCTURES (NOTE 1)
C-410-D	FLUORINE STORAGE BUILDING AND VENT STACK
C-531	SWITCH HOUSE AND APPURTENANT STRUCTURES
C-531-1	SWITCH HOUSE
C-531-2	SWITCHYARD
C-531-3A	FIRE VALVE HOUSE NO. 1
C-531-3B	FIRE VALVE HOUSE NO. 2

PADUCAH FACILITIES
Leased To USEC

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-532	RELAY HOUSE
C-533	SWITCH HOUSE AND APPURTENANT STRUCTURES
C-533-1	SWITCH HOUSE
C-533-2	SWITCHYARD
C-533-3A	FIRE VALVE HOUSE NO. 1
C-533-3B	FIRE VALVE HOUSE NO. 2
C-533-3C	FIRE VALVE HOUSE NO. 3
C-533-3D	FIRE VALVE HOUSE NO. 4
C-535	SWITCH HOUSE AND APPURTENANT STRUCTURES
C-535-1	SWITCH HOUSE
C-535-2	SWITCHYARD
C-535-3A	FIRE VALVE HOUSE NO. 1
C-535-3B	FIRE VALVE HOUSE NO. 2
C-535-4	TEST SHOP (MAINTENANCE OFFICE)
C-536	RELAY HOUSE
C-537	SWITCH HOUSE AND APPURTENANT STRUCTURE
C-537-1	SWITCH HOUSE AND APPURTENANT STRUCTURES
C-537-2	SWITCHYARD
C-537-3A	FIRE VALVE HOUSE NO. 1
C-537-3B	FIRE VALVE HOUSE NO. 2
C-537-3C	FIRE VALVE HOUSE NO. 3
C-537-3D	FIRE VALVE HOUSE NO. 4
C-537-4	TEST SHOP
C-540	OIL PUMP HOUSE AND APPURTENANT STRUCTURES
C-540-A	OIL PUMP HOUSE
C-540-B	OIL STORAGE TANK (NORTHWEST)
C-540-C	OIL STORAGE TANK (SOUTHWEST)
C-540-D	OIL STORAGE TANK (NORTHEAST)

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-540-E	OIL STORAGE TANK (SOUTHEAST)
C-541	OIL PUMP HOUSE AND APPURTENANT STRUCTURES
C-541-A	OIL PUMP HOUSE
C-541-B	OIL STORAGE TANK (NORTHWEST)
C-541-C	OIL STORAGE TANK (SOUTHWEST)
C-541-D	OIL STORAGE TANK (NORTHEAST)
C-541-E	OIL STORAGE TANK (SOUTHEAST)
C-600	STEAM PLANT AND ASSOCIATED UTILITY APPURTENANT STRUCTURES.
C-601	NITROGEN GENERATOR BUILDING ADDITION
C-601-A	STEAM PLANT FUEL STORAGE TANK (CENTER)
C-601-B	STEAM PLANT FUEL STORAGE TANK (SOUTH)
C-601-C	STEAM PLANT FUEL OIL PUMP HOUSE
C-601-D	FUEL OIL STORAGE TANK (NORTH)
C-602	COAL STORAGE YARD
C-603-E	NITROGEN STORAGE TANK (EAST)
C-603-F	NITROGEN STORAGE TANK (CENTER)
C-603-G	NITROGEN STORAGE TANK (WEST)
C-604	UTILITIES MAINTENANCE BUILDING
C-605	SUBSTATION BUILDING
C-606	COAL CRUSHER BUILDING
C-607	EMERGENCY AIR COMPRESSOR GENERATOR BUILDING
C-611	WATER TREATMENT PLANT DISTRIBUTION SYSTEM AND APPURTENANT STRUCTURES
C-611-A	BUILDING AND SHOP STORAGE
C-611-B	HEAD HOUSE
C-611-B1	POLYMER FEED SYSTEM ENCLOSURE
C-611-C	FLOCCULATOR BASIN
C-611-D	SETTLING BASIN (NORTHEAST)
C-611-E	SETTLING BASIN (NORTHWEST)

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-611-F	SETTLING BASIN (SOUTHEAST)
C-611-F1	SECONDARY COAGULATION BASIN
C-611-F2	CHEMICAL FEED BUILDING FOR C-611-F1
C-611-G	SETTLING BASIN (SOUTHWEST)
C-611-H	FILTER BUILDING AND PUMP STATION
C-611-I	CLEAR WELL
C-611-M	NORTH CONCRETE SANITARY WATER STORAGE TANK
C-611-N	SOUTH CONCRETE SANITARY WATER STORAGE TANK
C-611-O	SANITARY WATER STORAGE TANK
C-611-P	PUMP HOUSE
C-611-Q	36 RAW WATER LINE BOOSTER STATION
C-611-R	WATER TANK-RCW FIRE WATER (HIGH PRESSURE)
C-611-S	CORROSION INHIBITOR BUILDING
C-611-T	BOOSTER PUMP STATION (PLANT WATER)
C-611-T-01	TEMP. OFFICE
C-611-U	SOFTENING FACILITY (WEST)
C-611-V	SLUDGE LAGOON
C-611-W	SLUDGE LAGOON
C-611-X	SOFTENING FACILITY (EAST)
C-611-Y	RECYCLE LAGOON
C-611-Z	FLOCCULATOR BASIN
C-615	SEWAGE DISPOSAL PLANT, COLLECTION SYSTEM AND APPURTENANT STRUCTURES
C-615-A	PRIMARY SETTLING TANK
C-615-B	FINAL SETTLING TANK
C-615-C	CONTROL BUILDING
C-615-D	DIGESTER
C-615-E	TRICKLING FILTER
C-615-F	TRICKLING FILTER

PADUCAH FACILITIES
Leased To USEC

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-615-G	SEWAGE LIFT STATION
C-615-H	SEWAGE LIFT STATION
C-615-H1	SEWAGE LIFT STATION
C-615-H2	SEWAGE LIFT STATION
C-615-J	LIFT STATION
C-615-K	MANHOLE
C-615-L	OIL CONTROL MONITORING STATION
C-615-M	OIL CONTROL STRUCTURE
C-615-N	OIL CONTAINMENT LAGOON
C-616	LIQUID POLLUTION ABATEMENT AND APPURTENANT STRUCTURES
C-616-A	CHEMICAL FEED BUILDING
C-616-B	CLARIFIER-EAST
C-616-C	LIFT STATION
C-616-D	SLUDGE VAULT AND VALVE PIT
C-616-E	SLUDGE LAGOON
C-616-F	FULL FLOW LAGOON
C-616-G	SULPHURIC ACID TANK
C-616-H1	FERROUS SULFATE STORAGE TANK (EAST)
C-616-H2	FERROUS SULFATE STORAGE TANK (WEST)
C-616-J	REDUCTION TANK-EAST
C-616-K	SERVICE BUILDING
C-616-L	EFFLUENT CONTROL VAULT
C-616-M	CLARIFIER-WEST
C-616-N	REDUCTION TANK-WEST
C-616-P	SLUDGE VAULT AND VALVE PIT
C-617-A	EFFLUENT CONTROL STATION
C-617-B	LAGOON
C-620	AIR COMPRESSOR ROOM

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-631	RCW PUMP HOUSE AND APPURTENANT STRUCTURES
C-631-01	PUMP HOUSE
C-631-02	COOLING TOWER
C-631-03	PUMP HOUSE (FIREWATER)
C-631-04	BLENDING PUMP HOUSE
C-631-05	BLENDING COOLING TOWER (WEST)
C-631-06	BLENDING COOLING TOWER (EAST)
C-631-07	MAINTENANCE SHOP
C-631-08	CHANGE HOUSE
C-631-09	ASBESTOS CREW BREAKROOM
C-631-10	ASBESTOS CREW STORAGE
C-633	RCW PUMP HOUSE AND APPURTENANT STRUCTURES
C-633-1	PUMP HOUSE
C-633-2A	COOLING TOWER (SOUTH)
C-633-2B	COOLING TOWER (NORTH)
C-633-3	BLENDING PUMP HOUSE
C-633-4	BLENDING COOLING TOWER (NORTH)
C-633-5	BLENDING COOLING TOWER (SOUTH)
C-633-6	SAND FILTER BUILDING
C-635	RCW PUMPHOUSE AND APPURTENANT STRUCTURES
C-635-1	PUMP HOUSE AND PIPING
C-635-2	COOLING TOWER
C-635-3	BLENDING PUMP HOUSE
C-635-4	BLENDING COOLING TOWER (NORTH)
C-635-5	BLENDING COOLING TOWER (SOUTH)
C-635-6	PROCESS WASTE HEAT UTILIZATION PUMP HOUSE
C-637	RCW PUMP HOUSE AND APPURTENANT STRUCTURES
C-637-1	PUMP HOUSE

PADUCAH FACILITIES
Leased To USEC

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-637-2A	COOLING TOWER (SOUTH)
C-637-2B	COOLING TOWER (NORTH)
C-637-3	BLENDING PUMP HOUSE
C-637-4	BLENDING COOLING TOWER (NORTH)
C-637-5	BLENDING COOLING TOWER (SOUTH)
C-637-6	SAND FILTER BUILDING
C-710	TECHNICAL SERVICES BUILDING AND APPURETENANT STRUCTURES
C-710-A	GAS CYLINDER STORAGE BUILDING
C-710-B	STORAGE FACILITY
C-711	GAS MANIFOLD
C-712	ACID NEUTRALIZATION PIT
C-720	MAINTENANCE AND STORES BUILDING AND APPURTENANT STRUCTURES
C-720-A	COMPRESSOR SHOP ADDITION
C-720-B	MACHINE SHOP ADDITION
C-720-C	CONVERTER SHOP ADDITION
C-720-C1	BARRIER STORAGE
C-720-D	TRANSFORMER BUILDING
C-720-E	CHANGE HOUSE ADDITION
C-720-G	PEM RECEIVING BUILDING
C-720-H	WAREHOUSE
C-720-J	AIR LOCK
C-720-K	INSTRUMENT SHOP ADDITION
C-720-L	OXYGEN FACILITY
C-720-M	FIELD INSTRUMENT TRAILER
C-720-N	RAILROAD SCALE HOUSE
C-720-N1	RAILROAD CLASIFICATION YARD
C-720-P	INSTRUMENT MAINTENANCE TRAILER
C-720-Q	INSTRUMENT MAINTENANCE STORAGE TRAILER

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-722	ACID NEUTRALIZATION PIT
C-724-A	CARPENTER SHOP ANNEX
C-724-B	CARPENTER SHOP
C-724-C	PAINT SHOP
C-724-D	LUMBER STORAGE BUILDING
C-725	PAINT SHOP
C-726	SANDBLAST BUILDING
C-727	HEAT TREATING FACILITY
C-728	MOTOR CLEANING FACILITY
C-729	ACETYLENE BUILDING
C-731	RAILROAD REPAIR EQUIPMENT STORAGE BUILDING
C-732	MAINTENANCE MATERIALS STORAGE BUILDING
C-740	MATERIAL YARD
C-740-A	SEMI-TRAILER UNLOADING FACILITY
C-740-B	OIL DRUM STORAGE SHELTER
C-740-C	MISCELLANEOUS MATERIALS STORAGE YARD
C-741	MOBILE EQUIPMENT BUILDING
C-742	CYLINDER STORAGE BUILDING
C-742-B	DRYING AGENT CYLINDER STORAGE
C-743	OFFICE BUILDING
C-743-T-06	TEMPORARY OFFICE
C-743-T-07	TEMPORARY OFFICE
C-743-T-08	TEMPORARY OFFICE
C-743-T-11	TEMPORARY OFFICE
C-743-T-12	TEMPORARY OFFICE
C-743-T-13	TEMPORARY OFFICE
C-743-T-14	TEMPORARY OFFICE
C-743-T-15	TEMPORARY OFFICE

**PADUCAH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-743-T-16	TEMPORARY OFFICE
C-744	LUBRICATION BUILDING
C-745-A	2 1/2 TON CYLINDER YARD (NOTE 2)
C-745-B	10-TON CYLINDER YARD (NOTE 3)
C-745-B1	CYLINDER STORAGE YARD OFFICE
C-745-E	KELLOGG STORAGE YARD
C-745-H	SAFEGUARD CYLINDER STORAGE YARD
C-745-J	FOREIGN CYLINDER STORAGE YARD
C-745-Q	CYLINDER STORAGE YARD (NOTE 4)
C-746-A3	TRASH SORTING AND PROCESSING FACILITY
C-746-G	ELECTRIC EQUIPMENT STORAGE
C-746-H1	PEM STORAGE SLAB
C-746-H2	PEM STORAGE SLAB
C-746-L	TRACTOR STORAGE
C-746-Q1	HIGH ASSAY WASTE STORAGE FACILITY
C-750	GARAGE AND APPURTENANT STRUCTURES
C-751	FUEL DISPENSING FACILITY
C-800	MOTORCYCLE PARKING AREA
C-801	OHIO AVENUE BUS SHELTER
C-810	PARKING AREA (C-100)
C-811	PARKING AREA (C-720)
C-RWS	RAW WATER PUMPING STATION AND PIPELINES

NOTE 1: Contingent upon DOE funding S&M and retaining associated liabilities with non-operating areas.

NOTE 2: With exception of DOE cylinder storage in rows A through F, AA through FF, R, and RR.

NOTE 3: With exception of DOE cylinder storage in rows C, E, I, N, O, R, S, X, CC, EE, and II.

NOTE 4: With exception of DOE tail cylinder storage in rows A and V.

PADUCAH FACILITIES
Retained By DOE

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-200	UNDERGROUND STORAGE TANKS
C-204	DISINTEGRATOR BUILDING
C-218	FIRING RANGE
C-301	STORAGE BUILDING
C-340	REDUCTION AND METALS FACILITY
C-340-A	POWDER BUILDING
C-340-B	METALS BUILDING
C-340-C	SLAG BUILDING
C-340-D	MAGNESIUM STORAGE BUILDING
C-340-E	EMERGENCY POWER FOR CRITICAL ALARMS
C-370-E	WATER QUALITY MONITORING STATION (LITTLE BAYOU CREEK)- INACTIVE
C-370-W	WATER QUALITY MONITORING STATION (BIG BAYOU CREEK)-INACTIVE
C-400	GOLD DISSOLVER STORAGE TANK
C-400	TECHNETIUM STORAGE TANK
C-400 & C-404	UNDERGROUND TRANSFER LINE
C-401	NEUTRALIZING PIT
C-402	LIME HOUSE
C-403	NEUTRALIZING PIT
C-404	LOW-LEVEL RADIOACTIVE WASTE BURIAL GROUND
C-405	CONTAMINATED ITEMS INCINERATOR
C-409-C	HAZARDOUS WASTE PILOT PLANT
C-410-A	HYDROGEN HOLDER
C-410-B	SLUDGE LAGOON
C-410-C	HYDROFLUORIC ACID NEUTRALIZATION BUILDING
C-410-E	HYDROFLUORIC ACID EMERGENCY HOLDING POND
C-410-F	HYDROFLUORIC ACID STORAGE BUILDING (NORTH)
C-410-G	HYDROFLUORIC ACID STORAGE BUILDING (CENTER)
C-410-H	HYDROFLUORIC ACID STORAGE BUILDING (SOUTH)

PADUCAH FACILITIES
Retained By DOE

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-410-I	ASH RECEIVER SHELTER
C-410-J	HYDROFLUORIC ACID STORAGE BUILDING (EAST)
C-411	CELL MAINTENANCE BUILDING
C-415	FEED PLANT STORAGE BUILDING
C-416	EQUIPMENT CLEANING FACILITY
C-420	GREENSALT PLANT
C-603-A	NITROGEN MANIFOLD BUILDING
C-603-B	NITROGEN STORAGE TANK
C-603-C	NITROGEN RECEIVER (NORTH)
C-603-D	NITROGEN RECEIVER (SOUTH)
C-603-H	NITROGEN GENERATOR-CONTROL HOUSE
C-603-I	NITROGEN GENERATOR-TOWER AREA
C-623	NORTH GROUND WATER TREATMENT BUILDING
C-632-B	ACID STORAGE TANK
C-634-B	ACID STORAGE TANK
C-710	UNDERGROUND STORAGE TANKS
C-720	UNDERGROUND PETROLEUM NAPHTHA PIPE
C-720	TCE DEGREASER (INACTIVE)
C-721	GAS MANIFOLD STORAGE
C-730	MAINTENANCE SERVICES BUILDING
C-733	WASTE OIL AND CHEMICAL STORAGE FACILITY
C-743-T-01	ENVIRONMENTAL RESTORATION OFFICE
C-743-T-02	ENVIRONMENTAL RESTORATION OFFICE
C-743-T-03	OFFICE TRAILER
C-743-T-04	CHANGE HOUSE
C-743-T-05	CHANGE HOUSE
C-745-C	14-TON CYLINDER YARD (NOTE 5)
C-745-D	CYLINDER STORAGE YARD

**PADUCAH FACILITIES
Retained By DOE**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-745-F	CYLINDER STORAGE YARD
C-745-G	CYLINDER STORAGE YARD
C-745-K	CYLINDER STORAGE YARD
C-745-L	CYLINDER STORAGE YARD (NOTE 6)
C-745-M	CYLINDER STORAGE YARD (NOTE 7)
C-745-N	CYLINDER STORAGE YARD
C-745-P	CYLINDER STORAGE YARD
C-746-A	NORTH WAREHOUSE
C-746-A1	UST
C-746-A2	UST
C-746-B	SOUTH WAREHOUSE
C-746-C	CLEAN SCRAP YARD (NORTH)
C-746-C1	CLEAN SCRAP YARD (SOUTH)
C-746-D	CLASSIFIED SCRAP YARD
C-746-E	CONTAMINATED SCRAP YARD (NORTH)
C-746-E1	CONTAMINATED SCRAP YARD (SOUTH)
C-746-F	CLASSIFIED SCRAP BURIAL YARD
C-746-H3	PEM STORAGE SLAB
C-746-H4	NICKEL INGOT STORAGE PAD
C-746-K	SANITARY LANDFILL (ABANDONED)
C-746-M	WASTE ASKAREL STORAGE FACILITY
C-746-P	SCRAP METAL YARD (EAST)
C-746-P1	SCRAP METAL YARD (WEST)
C-746-Q	GREENSALT DRUM STORAGE BUILDING
C-746-R	WASTE ORGANIC STORAGE AREA
C-746-S, CELL 1	SANITARY LANDFILL
C-746-S, CELL 2	SANITARY LANDFILL
C-746-S, CELL 3	SANITARY LANDFILL

**PADUCAH FACILITIES
Retained By DOE**

<u>FACILITY</u>	<u>DESCRIPTION</u>
C-746-S1	LANDFILL SERVICE BUILDING
C-746-T	INERT LANDFILL
C-747	BURIAL AREA (INACTIVE)
C-747-A	BURIAL AREA (INACTIVE)
C-747-B	BURIAL AREA (INACTIVE)
C-747-C	OIL LANDFARM AREA
C-748-A	KOW DISPOSAL AREA (INACTIVE)
C-748-B	BURIAL AREA (INACTIVE)
C-749	URANIUM SCRAP BURIAL YARD (INACTIVE)
C-750-A	UST GASOLINE
C-750-B	UNDERGROUND STORAGE TANK - DIESEL
C-750-D	UNDERGROUND STORAGE TANK
C-750-TANK	WASTE OIL TANK
C-753-A	TSCA STORAGE BUILDING (UNDER CONSTRUCTION)
Z-SWMU- 11	C-400 TRICHLOROETHYLENE LEAK SITE
Z-SWMU- 12	C-747-A UF4 DRUM YARD
Z-SWMU- 30	C-747-A BURN AREA
Z-SWMU- 31	C-720 COMPRESSOR PIT WATER STORAGE TANK
Z-SWMU- 74	C-340 PCB SPILL SITE
Z-SWMU- 76	C-632-B H2SO4 STORAGE TANK
Z-SWMU- 77	C-634-B H2SO4 STORAGE TANK
Z-SWMU- 91	UF6 CYLINDER DROP TEST AREA
Z-SWMU- 92	FILL AREA FOR DIRT FROM C-420 PCB SPILL SITE
Z-SWMU- 93	CONCRETE DISPOSAL
Z-SWMU- 96	COOLING TOWER SCRAP WOOD PILE
Z-SWMU-100	FIRE TRAINING AREA
Z-SWMU-137	C-746-A INACTIVE PCB TRANSFORMER/SUMP
Z-SWMU-138	C-100 SOUTH SIDE LAWN (FILLED W/ C-611 SLUDGE)

**PADUCAH FACILITIES
Retained By DOE**

<u>FACILITY</u>	<u>DESCRIPTION</u>
Z-SWMU-145	RESIDENTIAL LANDFILL BORROW AREA
Z-SWMU-159	C-746 H3PAD
Z-SWMU-160	C-745 CYLINDER YARD SPOILS AREA-PCB SOIL CONTAMINATION
Z-SWMU-162	C-617-A SANITARY WATER LINE - SOIL BACKFILL
Z-SWMU-169	C-410-E HF VENT SURGE PROTECTION TANK
Z-SWMU-170	C-729 ACETYLENE BUILDING DRAIN PITS
Z-SWMU-183	MCGRAW UST

Z-SWMU-XXXX

Solid Waste Management Units referenced on the following drawings:
CSE-16924-M01 Rev 0 MMES
CSE-16924-M02 Rev 4 MMES
CSE-16924-9016 Sheet 16/49 CH2M Hill
CSE-16924-9021 Sheet 21/49 CH2M Hill
CSE-16924-9034 Sheet 34/49 CH2M Hill

NOTE 5: Empty cylinders transfer to USEC but remain in C-745-C.
NOTE 6: With exception of cylinders stored in rows II-A, II-B, AND JJ thru ZZ.
NOTE 7: With exception of cylinders stored in rows B thru L.

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**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 100	Administration Building
X- 100B	Air Conditioning Equipment Building
X- 100L	Environmental Control Trailer
X- 101	Health Services
X- 102	Cafeteria
X- 103	Aux Office Building
X- 104	Guard Headquarters
X- 104A	Indoor Firing Range
X- 105	Electronic Maintenance Building
X- 106	Tactical Response Building
X- 106B	Fire Training Building
X- 108A	South Portal and Shelter
X- 108B	North Portal and Shelter
X- 108E	Construction Portal
X- 108H	Pike Ave Portal
X- 109A	Personnel Monitoring Station
X- 109B	Personnel Monitoring Station
X- 109C	Personnel Monitoring Station
X- 111A	SNM Monitoring Portal (X-326)
X- 111B	SNM Monitoring Portal (NW X-326)
X- 112	Data Processing Building
X- 114A	Outdoor Firing Range
X- 120	South Weather Station
X- 200	Site Prep, Grading, Landscaping.
X- 201	Land and Land Rights
X- 202	Roads
X- 204	Railroad and Railroad Overpass
X- 206A	Main Parking Lot (N)

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 206B	Main Parking Lot (S)
X- 206E	Construction Parking
X- 206H	Pike Ave Parking Lot
X- 206J	South Office Parking Lot
X- 208	Security Fence
X- 208A	Boundary Fence
X- 210	Sidewalks
X- 215A	Electrical Distribution To Process Buildings
X- 215B	Electrical Distribution To Other Areas
X- 215C	Exterior Lighting
X- 215D	Electric Power Tunnel
X- 220A	Instrumentation Tunnels
X- 220B1	Process Instrumentation Lines
X- 220B2	Carrier Communications Systems
X- 220B3	Water Supply Telemetry Lines
X- 220C	Superior American Alarm System
X- 220D1	General Telephone
X- 220D2	Process Telephone
X- 220D3	Emergency Telephone System
X- 220E1	Evacuation Public Address System
X- 220E2	Process Public Address System
X- 220E3	Power Public Address System
X- 220F	Plant Radio System
X- 220G	Pneumatic Dispatch System
X- 220H	MuCulloh Alarm System
X- 220J	Radiation Alarm System
X- 220K	Cascade Automatic Data Processing System
X- 220L	Classified Computer System

**PORTSMOUTH FACILITIES
Leased To USEC**

FACILITY

DESCRIPTION

X- 220N	Security Alarm and Surveillance System.
X- 220P	Maintenance Work Authorization and Control System
X- 220R	Public Warning Siren System
X- 220S	Power Operations SCADA System
X- 230	Water Supply Line
X- 230A	Sanitary and Fire Water Distribution System
X- 230B	Sanitary Sewers
X- 230C	Storm Water Sewers
X- 230D	Softened Water Distribution System
X- 230E	Plant Water System (Makeup To Cooling Towers)
X- 230F	Raw Water Supply Lines
X- 230G	RCW System
X- 230H	Fire Water Distribution System
X- 230J1	Environmental Monitoring Station
X- 230J2	South Holding Pond Effluent Monitoring Station
X- 230J3	West Environmental Monitoring Station
X- 230J4	Environmental Air Monitoring Station
X- 230J5	West Environmental Sampling Building
X- 230J6	Northeast Monitoring Facility
X- 230J7	East Monitoring Facility
X- 230J8	Environmental Storage Building
X- 230J9	North Environmental Sampling Station
X- 230K	South Holding Pond
X- 230L	North Holding Pond
X- 232A	Nitrogen Distribution System
X- 232B	Dry Air Distribution System
X- 232C1	Tie Line No. 1 X-342 to X-330.
X- 232C2	Tie Line No. 2 X-330 to X-326

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 232C3	Tie Line No. 3 X-330 to X-333
X- 232C4	Tie Line No. 4 X-326 to X-370
X- 232C5	Tie Line No. 5 X-343 to X-333
X- 232D	Steam and Condensate System
X- 232E	Freon Distribution Lines
X- 232F	Fluorine Distribution System
X- 232G	Supports For Distribution Lines
X- 240A	RCW System (Cathodic Protection)
X- 300	Plant Control Facility
X- 300A	Process Monitoring Building
X- 300B	Plant Control Facility Carport
X- 300C	Emergency Antenna
X- 326	Process Building (Note 1)
X- 330	Process Building
X- 333	Process Building
X- 334	Transformer Cleaning Building
X- 342A	Feed, Vaporization Fluorine Generation Building
X- 342B	Fluorine Storage Building
X- 342C	Waste NF Neutralization Pit
X- 343	Feed, Vaporization and Sampling Facility
X- 344A	UF6 Sampling Facility
X- 344B	Maintenance Storage Building
X- 344E	Gas Ventilation Stack
X- 501	Substation
X- 501A	Substation
X- 502	Substation
X- 515	330 KV Tie Line
X- 530A	Switch Yard

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 530B	Switch House
X- 530C	Test & Repair Facility
X- 530D	Oil House
X- 530E	Valve House
X- 530F	Valve House
X- 530G	GCEP Oil Pumping Station
X- 533	Transformer Storage Pad
X- 533A	Switch Yard
X- 533B	Switch House
X- 533C	Test & Repair Facility
X- 533D	Oil House
X- 533E	Valve House
X- 533F	Valve House
X- 533H	Gas Reclaiming Cart Garage
X- 540	Telephone Building
X- 600	Steam Plant
X- 600A	Coal Pile Yard
X- 600B	Steam Plant Shop
X- 600C	Ash Wash Treatment Building
X- 605	Sanitary Water Control House
X- 605A	Sanitary Water Wells
X- 605H	Booster Pump House and Appurtenances
X- 605I	Chlorinator Building
X- 605J	Diesel Generator Building
X- 608	Raw Water Pump House
X- 608A	Raw Water Wells (1 to 4)
X- 608B	Raw Water Wells (5 to 15)
X- 611	Water Treatment Plant and Appurtenances

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 611B	Sludge Lagoon
X- 611C	Filter Building
X- 611D	Recarbonization Instrument Building
X- 612	Elevated Water Tank
X- 614A	Sewage Pumping Station
X- 614B	Sewage Lift Station
X- 614D	South Sewage Lift Station
X- 614P	Northwest Sewage Lift Station
X- 616	Liquid Effluent Control Facility
X- 617	South PH Control Facility
X- 618	North Holding Pond Storage Building
X- 621	Coal Pile Runoff Treatment Facility
X- 622T	Carbon Filtration (X-705 Sump water)
X- 626-1	Recirculating Water Pump House
X- 626-2	Cooling Tower
X- 630-1	Recirculating Water Pump House
X- 630-2A	Cooling Tower
X- 630-2B	Cooling Tower
X- 630-3	Acid Handling Station
X- 633-1	Recirculating Water Pump House
X- 633-2A	Cooling Tower
X- 633-2B	Cooling Tower
X- 633-2C	Cooling Tower
X- 633-2D	Cooling Tower
X- 640-1	Firewater Pump House
X- 640-2	Elevated Water Tank
X- 700	Converter Shop and Cleaning Building
X- 700A	Air Conditioning Equipment Building

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 701A	Lime House
X- 701D	Water Deionization Building
X- 705	Decontamination Building (Note 2)
X- 705D	Heating Booster Pump Building
X- 710	Technical Services Building
X- 710A	Technical Services Gas Manifold Shed
X- 710B	Explosion Test Facility
X- 720	Maintenance & Stores Building
X- 720A	Maintenance and Stores Building Gas Manifold Shed
X- 720B	Radio Base Station Building
X- 720C	Paint & Oil Storage Building
X- 721	Radiation Instrument Calibration Facility
X- 741	Oil Drum Storage Facility
X- 742	Gas Cylinder Storage Facility
X- 743	Lumber Storage Shed
X- 744B	Salt Storage Building
X- 744H	Bulk Storage Building
X- 744J	Bulk Storage Building
X- 744L	Stores and Maintenance
X- 744W	Surplus and Salvage Warehouse
X- 745B	Toll Enrichment Process Gas Yard - UEA
X- 745D	Cylinder Storage Yard
X- 745E	Northwest International Process Gas Yard - UEA
X- 745F	North Process Gas Stockpile Yard
X- 746	Materials Receiving & Inspection Building
X- 747A	Material Storage Yard
X- 747B	Material Storage Yard
X- 747C	Material Storage Yard

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 747D	Material Storage Yard
X- 747E	Material Storage Yard
X- 747F	Miscellaneous Material Storage Yard
X- 747J	Decontamination Storage Yard
X- 748	Truck Scale Facility
X- 750	Mobile Equipment Maintenance Shop
X- 750A	Garage Storage Building
X- 760	Chemical Engineering Building
X-1000	Adminstration Building
X-1007	Fire Station
X-1020	Emergency Operations Center (EOC)
X-1107A	Administrative Portal
X-1107B	Interplant Portal
X-1107BP	Admin. Portal
X-1107D	NE Portal
X-1107E	Northwest Portal
X-1107F	South Portal
X-2200	Site Preparation, Grading, and Landscaping
X-2202	Roads (GCEP)
X-2204	GCEP Railroads
X-2207A	GCEP Administrative Parking Lot
X-2207D	Northwest Parking Lot
X-2208	Security Fence
X-2210	Sidewalks
X-2215A	Underground Electrical Distribution to Process Buildings
X-2215B	Electrical Distribution To Areas Other Than Process Buildings
X-2215C	Exterior Light Fixtures
X-2220C	Fire and Supervisory Alarm System

**PORTSMOUTH FACILITIES
Leased To USEC**

FACILITY

DESCRIPTION

X-2220D	Telephone System
X-2220L	Classified Computer System
X-2220N	Security Access Control and Alarm System
X-2230A	Sanitary Water Distribution System
X-2230B	GCEP Sanitary Sewers
X-2230C	Storm Sewers
X-2230F	Raw Water Supply Line
X-2230G	Recirculating Water System
X-2230H	Fire Water Distribution System
X-2230J	Liquid Effluent System
X-2230M	Holding Pond Number 1
X-2230N	Holding Pond Number 2
X-2230T	Recirculation Heating Water System
X-2232A	Nitrogen Distribution System
X-2232B	Dry Air Distribution System
X-2232D	Steam and Condensate System
X-2232G	Supports for Distribution Lines
X-3000	Electronics Maintenance Building
X-5000	GCEP Switch House
X-5001	Substation
X-5001A	Valve House
X-5001B	Oil Pumping Station
X-5015	HV Electrical System
X-6000	GCEP Cooling Tower Pump House
X-6001	Cooling Tower
X-6001A	Valve House
X-6609	Raw Water Wells
X-6613	Sanitary Water Storage Tank

**PORTSMOUTH FACILITIES
Leased To USEC**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X-6614E	Sewage Lift Station
X-6614G	Sewage Lift Station
X-6614H	Sewage Lift Station
X-6614J	Sewage Lift Station
X-6619	Sewage Treatment Plant
X-6643	Fire Water Storage Tanks #1 & #2
X-6644	Fire Water Pump House
X-7721	Maintenance Stores Training Building (Training)
X-7727	Interplant Transfer Corridors
X-7745R(N)	Recycle Assembly Storage Yard - North
XT- 801	South Offices Building

NOTE 1: The seven cages containing RCRA waste in X-326 will not be leased.
NOTE 2: The oxide conversion area (X-705E) will not be leased.

**PORTSMOUTH FACILITIES
Retained By DOE**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 208B	SNM Security Fences X-326 and X-345
X- 231A	Southeast Oil Biodegradation Plot
X- 231B	Southwest Oil Biodegradation Plot
X- 235	South Ground Water Collection System
X- 237	Little Beaver Ground Water Collection System
X- 344C	HF Storage Building
X- 344D	HF Neutralization Pit
X- 344F	Safety Building
X- 345	SNM Storage Building
X- 611A	Lime Sludge Lagoons (North, Middle, South)
X- 615	Old Sewage Treatment Plant
X- 622	South Ground Water Treatment Building
X- 623	North Groundwater Treatment Building
X- 624	Little Beaver Groundwater Treatment Facility
X- 701B	Holding Pond (Drained)
X- 701C	Neutralization Pit and Tank
X- 701E	Neutralization Building
X- 705A	Incinerator
X- 705B	Contaminated Burnable Storage Facility
X- 734	Old Sanitary Landfill
X- 735	Sanitary Landfill
X- 735A	Landfill Utility Building
X- 736	West Construction Spoils Landfill
X- 740	Waste Oil Storage Facility
X- 744G	Bulk Storage Building
X- 744K	Warehouse K
X- 744N	Warehouse N - Non UEA
X- 744P	Warehouse P - Non UEA

**PORTSMOUTH FACILITIES
Retained By DOE**

<u>FACILITY</u>	<u>DESCRIPTION</u>
X- 744Q	Warehouse Q - Non UEA
X- 744S	Warehouse S - Non UEA
X- 744T	Warehouse T - Non UEA
X- 744U	Warehouse U - Non UEA
X- 744Y	Waste Storage Yard
X- 745C	West Depleted Storage Yard
X- 747G	Northeast Contaminated Storage Yard
X- 747H	Northwest Surplus and Scrap Yard
X- 749	South Contaminated Materials Storage Yard
X- 749A	South Classified Burial Yard
X- 751	Mobile Equipment Maintenance Shop OANG
X- 752	Warehouse
X- 770	Mechanical Test
X-3001	Process Building
X-3002	GCEP Process Building #2
X-3012	Process Support Building
X-3346	Feed and Withdrawal Facility
X-7725	Recycle/Assembly Building
X-7725A	Waste Accountability Facility
X-7726	Centrifuge Training and Test Facility
X-7745R(S)	Recycle/Assembly Storage Yard - South
XT- 847	Construction Warehouse (Note 3)
Z-SWMU-QUAD-IV	Southern end of railroad spur which is used as drum storage area
Z-SWMU-QUAD-IV	Chemical and petroleum containment tanks east of X-533C
Z-SWMU-X701	Northeast oil biodegradation plot area, which was formerly used for the disposal of X-615 sludge
Z-SWMU-X710	Inactive "hot pit" in the area of X-710 that was once used for the storage of radioactive wastewater
Z-SWMU-X734A	Inactive construction spoils disposal area

**PORTSMOUTH FACILITIES
Retained By DOE**

FACILITY

DESCRIPTION

Z-SWMU-X734B

Inactive construction spoils disposal area

Z-SWMU-X744

Retrievable waste storage area

Z-SWMU-XXXX

Solid Waste Management Units, as identified on Portsmouth Environmental Information Management System Drawing, printed 2/9/93.

NOTE 3: DOE will offer this facility to USEC for lease no later than July 1, 1995.

EXHIBIT E

MEMORANDUM OF AGREEMENT

between

UNITED STATES DEPARTMENT OF ENERGY

and

UNITED STATES ENRICHMENT CORPORATION

for

ELECTRIC POWER

July 1, 1993

MEMORANDUM OF AGREEMENT
BETWEEN THE
UNITED STATES DEPARTMENT OF ENERGY
AND THE
UNITED STATES ENRICHMENT CORPORATION

THIS AGREEMENT, entered into as of this first day of July, 1993, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), represented by the SECRETARY OF ENERGY (hereinafter referred to as the "Secretary"), the statutory head of the DEPARTMENT OF ENERGY (hereinafter referred to as "DOE"), and the UNITED STATES ENRICHMENT CORPORATION (hereinafter referred to as "USEC");

WITNESSETH THAT:

WHEREAS, the parties have entered into a Lease Agreement effective July 1, 1993 ("the Lease"), relating to the GDPs;

WHEREAS, the Secretary has determined that certain power purchase agreements related to the operation of the Portsmouth Gaseous Diffusion Plant and the Paducah Gaseous Diffusion Plant cannot be transferred to USEC by their terms; and

WHEREAS, DOE is authorized to continue to receive power under such agreements and resell such power to USEC at cost;

NOW, THEREFORE, the parties hereto agree as follows:

ARTICLE I - DEFINITIONS

A. As used throughout this Agreement, the following terms shall have the meanings set forth below:

1. The term "EEI" means Electric Energy, Incorporated, and any successor.

2. The term "EEI Power Purchase Agreement" means the May 4, 1951, Power Agreement, as amended and restated in Modification No. 12, dated September 2, 1987, as further amended, supplemented or modified.

3. The term "OVEC" means Ohio Valley Electric Corporation and any successor.

4. The term "OVEC Power Purchase Agreement" means the Power Agreement dated October 15, 1952, between OVEC and the United States of America, as amended and restated in modification

No. 14, effective as of October 15, 1992, as further amended, supplemented, and modified.

5. The term "Power Purchase Agreements" means the EEI Power Purchase Agreement and the OVEC Power Purchase Agreement.

6. The term "Power Suppliers" means OVEC and EEI.

B. Unless otherwise defined herein or required by the provisions of this Agreement, all other terms have the meaning as defined in the Lease.

ARTICLE II - PURPOSE OF MEMORANDUM OF AGREEMENT

The general purpose of this memorandum of agreement (MOA) between DOE and USEC is to clarify the working relationships and responsibility for liabilities incident to supply of electrical power from OVEC and/or EEI for the operation of the GDPs pursuant to the Power Purchase Agreements.

ARTICLE III - POWER SUPPLY

1. DOE will make the energy and power purchased through the Power Purchase Agreements available to USEC.

2. DOE will continue to hold and maintain the Power Purchase Agreements. DOE will also continue to be responsible for the administration of these Agreements.

3. USEC will be responsible for providing the budgetary resources for any and all costs associated with the Power Purchase Agreements except the following:

- a. All charges associated with the demand and energy used to operate the Portsmouth Gaseous Diffusion Plant and the Paducah Gaseous Diffusion Plant before July 1, 1993;
- b. Prior service years post-retirement benefit obligations pursuant to section 6.04 of the OVEC Power Purchase Agreement;
- c. A share of DOE's liability pursuant to section 6.09 of the OVEC Power Purchase Agreement calculated based on the following formula:

$$LD = TLD \times \frac{TMW - UTMW}{TMW}$$

where:

LD = DOE's share of the section 6.09 liability.

TLD = DOE's total liability pursuant to Section 6.09 of the OVEC Power Purchase Agreement.

TMW = The total number of megawatt hours purchased by DOE from OVEC.

UTMW = The portion of TMW that USEC consumed;
and

- d. A share of DOE's liability pursuant to section 7.29 of the EEI Power Purchase Agreement calculated based on the following formula:

$$DL = TL \times \frac{TE - UTE}{TE}$$

where:

DL = DOE's share of the section 7.29 liability.

TL = DOE's total liability to EEI pursuant to section 7.29 of the EEI Power Purchase Agreement.

TE = The total energy purchased by DOE from EEI.

UTE = That portion of TE that USEC consumed.

This Section 3 of this Article III shall survive any expiration, conclusion or termination of the MOA.

4. In the administration of the Power Purchase Agreements, DOE agrees not to exercise any rights, take any actions, or consent to any action of the Power Suppliers pursuant to the terms of the Power Purchase Agreements without the consent of USEC except to the extent an emergency occurs or pursuant to the following sections of the Power Purchase Agreements:

- a. Section 1.06 of the OVEC Power Purchase Agreement,
- b. Section 1.07 of the OVEC Power Purchase Agreement,
- c. Section 1.09 of the OVEC Power Purchase Agreement,
- d. Section 6.08 of the OVEC Power Purchase Agreement;
and

- e. Section 1.02(5) of the EEI Power Purchase Agreement.

DOE agrees to request USEC's consent to the exercise of rights, action, or consent to any actions in a timely fashion and USEC agrees to respond to any such request in a timely fashion.

DOE agrees to take all actions requested by USEC under the Power Purchase Agreements that are consistent with the terms of the Power Purchase Agreements.

5. USEC will be responsible for verifying to DOE, in writing and in a timely manner, that the quantities of energy shown on the power billings was delivered. The terms under which USEC will pay DOE for power are set forth in Attachment A. DOE will be responsible for timely payment of all verified bills from the Power Suppliers to the extent USEC has provided funds to DOE.

6. DOE promptly will provide USEC or USEC's designee with copies of all written notices or communications to DOE from the Power Suppliers and the content of all oral communications from the Power Suppliers. If requested by USEC, DOE will notify OVEC or EEI that certain notices or communications under the Power Purchase Agreements should be made concurrently to USEC.

7. USEC will be responsible for operating and maintaining the Portsmouth and Paducah switchyards (and related equipment) to satisfy DOE's obligations under Section 1.05 of the OVEC Power Purchase Agreement and Section 1.03 of the EEI Power Purchase Agreement. DOE may review USEC's operation of the switchyards to ensure that they are operated and maintained in accordance with the Power Purchase Agreements.

8. USEC and DOE will cooperate to assure that all terms and conditions of the Power Purchase Agreements are satisfied.

9. DOE shall not amend, supplement, modify, assign, or terminate either of the Power Purchase Agreements, or consent to the amendment, supplement, modification, assignment, or termination of either of the Power Purchase Agreements, without the prior written consent of USEC. In any negotiations with the Power Suppliers concerning the Power Purchase Agreements, USEC shall be represented on DOE's negotiation team. DOE shall consent to any amendment, supplement, modification, assignment, or termination of either of the Power Purchase Agreements that is requested by USEC so long as USEC's request is consistent with DOE Order 4540.1C, Utility Acquisition and Management, and will not extend the term of the Power Purchase Agreement.

10. USEC will be solely responsible for any power purchase contracts other than Power Purchase Agreements but USEC shall not enter into power purchase contracts that conflict with the terms and conditions of the Power Purchase Agreements.

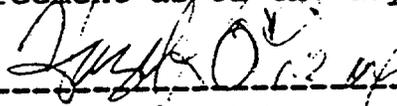
11. All costs associated with DOE's administration of the Power Purchase Agreements will be paid by USEC through the Lease Agreement dated July 1, 1993 between DOE and USEC.

12. Additional details regarding the roles and responsibilities related to the Power Purchase Agreements will be determined by the parties no later than July 15, 1993.

13. DOE agrees to provide USEC information that will assist USEC in purchasing power and will cooperate with USEC in DOE's maintenance and administration of the Power Purchase Agreements.

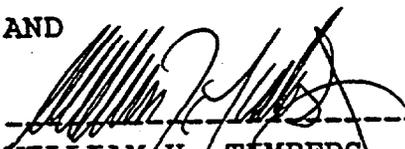
14. DOE shall pay through the Supply of Services Memorandum of Agreement (Exhibit F to the Lease) DOE's pro rata share of all charges, rates and liabilities associated with DOE's right under that Memorandum of Agreement to retain demand and energy for its own uses on and after July 1, 1993.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.



HAZEL R. O'LEARY
SECRETARY OF ENERGY

AND



WILLIAM H. TIMBERS
TRANSITION MANAGER
UNITED STATES ENRICHMENT CORPORATION

ATTACHMENT A TO EXHIBIT E

**ADVANCE PAYMENTS BY THE
UNITED STATES ENRICHMENT CORPORATION**

ADVANCE PAYMENTS BY USEC

1. USEC will use its best efforts to accurately project power consumption and its associated costs in a manner that will provide sufficient funds to DOE prior to the time such power is delivered and consumed. Based on these projections, the USEC shall make advance payments via wire transfer to DOE no later than one business day prior to the first and sixteenth of each month. The advance for the first day of each month shall cover the cost of power (demand and energy) to be consumed by USEC during the first fifteen days of each month, while the advance for the sixteenth day of each month shall cover the cost of power to be consumed by USEC during the balance of that month. USEC advances to cover periodic payments to OVEC for replacements and/or additional facilities shall be due one business day before DOE must pay OVEC.
2. If, at any time USEC increases its power purchases from the Power Suppliers during the period covered by an advance payment or USEC determines that the advance payment will be insufficient to fully fund payments to the Power Suppliers, then USEC shall make an additional wire transfer to cover the projected additional cost before the cost for power consumed by USEC exceeds the advance payment.
3. No later than the time of each wire transfer, USEC shall provide DOE with sufficient information, including access to USEC records, that will allow DOE to be reasonably assured that sufficient funds are being provided.
4. Three days prior to DOE's payments to the Power Supplier, DOE shall notify USEC of the actual amount owed to the Power Suppliers. If the actual amount is less than the advance payment, the difference shall be credited against USEC's next advanced payment. If the actual amount owed to the Power Suppliers exceeds the advance payment, USEC shall forward to DOE by wire transfer any additional amounts associated with inadvertent discrepancies between estimated power costs and actual power costs as well as the costs associated with power consumed by DOE.
5. If, at any time, DOE determines that the advance payments are inadequate to cover the remaining estimated

power costs during the period, DOE will so notify USEC. DOE and USEC will then use their best efforts to agree to any additional advance payments at least two business days prior to consumed power costs exceeding the total budgetary resource provided.

6. If, for any reason and as reasonably determined by DOE, the cumulative cost of power purchased under the Power Purchase Agreements exceeds the cumulative advance payments made by USEC, DOE will again notify USEC. If USEC does not make additional advance payments within two business days after such notification, DOE may instruct the Power Suppliers to immediately reduce permanent energy by any amount subject only to the continued safe operations of the gaseous diffusion plants. In addition, USEC shall not commit to any additional schedules for "take or pay" nonfirm power. These constraints will be removed after USEC makes additional advance payments.

APPENDIX A

**SAFETY BASIS AND FRAMEWORK FOR DOE OVERSIGHT
OF THE GASEOUS DIFFUSION PLANTS**

July 1, 1993

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PREFACE

The Energy Policy Act of 1992 (the Act) transfers responsibility for the gaseous diffusion plants (GDPs) at Portsmouth, Ohio, and Paducah, Kentucky, from the Department of Energy (DOE) to the newly created United States Enrichment Corporation (USEC) effective July 1, 1993. The Act requires the Nuclear Regulatory Commission (NRC) to establish regulatory standards by October 1994 which the NRC will use to certify and regulate the GDPs. Until NRC assumes regulatory oversight for the GDPs, USEC will assume responsibility for the plants under DOE requirements and oversight for nuclear safety and safeguards and security.

DOE's nuclear safety and safeguards and security programs derive their authority from the DOE orders system. However, not all DOE orders have nuclear safety or safeguards and security implications for the GDPs. The primary purpose of this document is to define the critical set of nuclear safety and safeguards and security requirements and the bases for DOE regulatory oversight that are essential for the continued safe and secure operations of the GDPs. This document applies to DOE regulatory oversight from July 1, 1993, until the NRC issues regulatory standards, certifies compliance, and/or approves a plan for compliance and assumes regulatory oversight for the GDPs.

The document describes how the applicable requirements are implemented at the GDPs and how these requirements will continue to be met during the period of DOE oversight.

A secondary purpose of this document is to make information available to the NRC regarding the DOE safety and safeguards and security bases for the GDPs; these may be useful to the NRC in developing regulatory standards for the GDPs.

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LIST OF ACRONYMS

ACR	Area Control Room
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
AHJ	Authority Having Jurisdiction
AIHA	American Industrial Hygiene Association
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CCR	Central Control Room
CFR	Code of Federal Regulations
CIP	Cascade Improvement Program
CoC	Certificate of Compliance
CUP	Cascade Upgrading Program
DMR-QA	Discharge Monitoring Report—Quality Assurance
DOE	Department of Energy
DOE-HQ	Department of Energy—Headquarters
DOELAP	Department of Energy Laboratory Accreditation Program
DOE/ORO	DOE's Oak Ridge Operations Office
DOT	Department of Transportation
EAL	Emergency Action Level
EDE	Effective Dose Equivalent
EML	Environmental Measurements Laboratory
EMSL-LV	Environmental Measurements Systems Laboratory—Las Vegas
Energy Systems	Martin Marietta Energy Systems, Inc.
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ERDA	Energy Research and Development Administration
ESH	Environment, Safety, and Health
ES&H	Environmental, Safety, and Health
ESO	Engineering Service Orders
FSAR	Final Safety Analysis Report
FY	Fiscal Year
GDP	Gaseous Diffusion Plant
HAUP	Higher Assay Upgrading Project
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEU	High Enriched Uranium
HQ	Headquarters
HSRC	Health and Safety Review Committee
IAEA	International Atomic Energy Agency
INPO	Institute of Nuclear Power operators
ISRC	Independent Safety Review Committee
K-25	Oak Ridge K-25 Site
LEU	Low Enriched Uranium
LLRW	Low Level Radioactive Waste
M&TE	Measuring and Test Equipment
MC&O	Management Controls and Oversight
M&O	Management and Operations

LIST OF ACRONYMS (Continued)

MIP	Maintenance Implementation Plan
MSDS	Material Safety Data Sheet
MSSA	Master Safeguards and Security Agreement
MTBF	Mean Time Between Failures
MW	MegaWatt
NCS	Nuclear Criticality Safety
NDA	Nondestructive Assay
NESHAP	National Emission Standard for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NIOSH	National Institute of Occupational Safety and Health
NIST	National Institute of Standards and Technology
NM	Nuclear Material
NMC&A	Nuclear Material Control and Accountability
NPDES	National Pollutant Discharge Elimination System
NQA-1	ASME National Consensus Quality Assurance Standard for Nuclear Facilities
NRC	Nuclear Regulatory Commission
NSI	Nuclear Safety Issue
NUREG	Prefix for Nuclear Regulatory Commission Issued Report
NVLAP	National Voluntary Laboratory Accreditation Program
ORO	Oak Ridge Operations
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
OSR	Operational Safety Requirement
PAT	Proficiency Analytical Testing
PCB	polychlorinated biphenyl
PEM	Process Equipment Modification
PEMP	PGDP Emergency Management Plan
PEP	PORTS Emergency Plan
PET	Proficiency Environmental Testing
PGA	Peak Ground Acceleration
PGDP	Paducah Gaseous Diffusion Plant
PORTS	Portsmouth Gaseous Diffusion Plant
PRA	Probabilistic Risk Assessment
PSAR	Preliminary Safety Analysis Report
PSE	Preliminary Safety Evaluation
PSR	Preliminary Safety Review
PSS	Plant Shift Superintendent
QA	Quality Assurance
QC	Quality Control
RadCon	Radiation Control
RCRA	Resource Conservation and Recovery Act
RCW	Recirculating Cooling Water
RWP	Radiation Work Permit
S&S	Safeguards and Security
SAA	Satellite Accumulation Area
SAR	Safety Analysis Report
SARP	Safety Analysis Report for Packaging

LIST OF ACRONYMS (Continued)

SEN	Secretary of Energy Notices
SNM	Special Nuclear Material
SPP	Standard Practice and Procedure
SSA	System Safety Analysis
SWU	Separative Work Unit
TDAG	Training Development and Administrative Guide
TLD	thermoluminescent dosimeter
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
UE	Uranium Enrichment
UEQPP	Uranium Enrichment Quality Program Plan
USAEC	United States Atomic Energy Commission
USEC	United States Enrichment Corporation
USQ	Unreviewed Safety Question
USQD	Unreviewed Safety Question Determination
WAC	Waste Acceptance Criteria

EXECUTIVE SUMMARY

The Energy Policy Act of 1992 (the Act) transfers responsibility for the gaseous diffusion plants (GDPs) at Portsmouth, Ohio, and Paducah, Kentucky, from the Department of Energy (DOE) to the newly created United States Enrichment Corporation (USEC) effective July 1, 1993. The Act requires the Nuclear Regulatory Commission (NRC) to establish regulatory standards by October 1994 which the NRC will use to certify and regulate the GDPs. Until NRC assumes regulatory oversight for the GDPs, USEC will assume responsibility for the plants under DOE requirements and oversight for nuclear safety and safeguards and security. In support of this DOE oversight, this report

- defines the essential safety and safeguards and security requirements for GDP operations,
- defines a continuing framework of safety and safeguards and security requirements for DOE oversight of the GDPs until regulatory oversight for the GDPs is assumed by NRC.
- provides information with respect to overall GDP safety, and
- provides information that may be useful to NRC in the development of regulatory standards for the GDPs.

To accomplish these objectives, this report contains five chapters that present the following information:

- introduction and background;
- plant safety, safety analyses, and historical DOE oversight programs;
- safety and safeguards and security requirements and how they will be implemented during the period of DOE oversight;
- DOE's oversight plan for nuclear safety and safeguards and security at the GDPs; and
- conclusions.

The information contained in this report supports the following conclusions.

1. The plants are currently operating safely under DOE nuclear safety and safeguards and security management and oversight program. This conclusion is supported by the results of both routine DOE audits and appraisal programs and special assessments.
2. The proven safety of the original GDP design has been enhanced through upgrade projects and the application of lessons learned over the GDPs' operational lifetimes. This conclusion is reinforced by the 1985 Final Safety Analysis Reports (FSARs), revisions to the FSARs, and the Operational Safety Requirements(OSRs). (PGDP KY-374, KY-315, and upgrades; PORTS GAT/GDP 1073 and GAT/GDP-1074 Parts A through L).
3. The plants can continue to operate safely and securely under the Implementation Requirements set forth in Chapter 3.

4. **The USEC's commitment to continue to meet these requirements coupled with DOE's regulatory oversight plan set forth in Chapter 4 provide adequate assurance that the plants will continue to meet the Implementation Requirements and operate safely under DOE regulatory oversight.**

1. INTRODUCTION

1.1 GASEOUS DIFFUSION PROCESS

Two operating plants in the United States use gaseous diffusion technology to enrich uranium for government programs and commercial customers, primarily electric utilities that operate nuclear power plants. These are the Portsmouth Gaseous Diffusion Plant (PORTS), located on 3800 acres in Pike County, Ohio, and the Paducah Gaseous Diffusion Plant (PGDP), located on 3423 acres in McCracken County, Kentucky. Presently Martin Marietta Energy Systems, Inc., (Energy Systems) operates the two plants for the Department of Energy (DOE).

The gaseous diffusion enrichment process uses the UF_6 form of uranium, which is a white, crystalline solid at ambient conditions and a gas at process conditions. The enrichment method increases ^{235}U concentrations by physical processes; the UF_6 gas is not chemically altered.

The gaseous diffusion process employs a series of compressors and converters to enrich the ^{235}U isotope of the process gas. The fundamental building block of the process consists of a compressor and a converter and is known as a stage. Stages are grouped together in series to form cells. The cells are then interconnected to provide what is known as a cascade. The compressors, which are driven by electric motors, are used to circulate the process gas and maintain flow through the cascade. The converters contain porous tubes or barriers through which the process gas is diffused. In each converter, a portion of the process gas diffuses through the barrier and is fed to the next higher stage, with the undiffused gas being recycled to the next lower stage. The diffused stream is slightly enriched with respect to ^{235}U , while the undiffused stream is depleted of ^{235}U to the same degree. Each stage also contains a gas cooler to remove the heat of compression from the process gas and a control valve for process control. (See Figs. 1-1 and 1-2, which depict a stage and a cell, respectively.) The output of PGDP is now one of the feed streams to PORTS.

PORTS can produce 7.9 million separative work units (SWUs) annually at a rated power consumption of 2100 megawatts (MW), while PGDP can produce 11.3 million SWUs annually at its rated power consumption of 3040 MW. The maximum assay at PGDP is currently limited to 2 wt % ^{235}U . PORTS uses PGDP's product as enriched feed and can enrich product to nearly 20 wt % ^{235}U . Safety documentation has been submitted, and modifications are in progress to increase the maximum PGDP assay. When the regulating authority approves the safety documentation and when the modifications are completed, PGDP will be able to produce assay at up to 5 wt % ^{235}U . PORTS also produced fully enriched uranium until 1992.

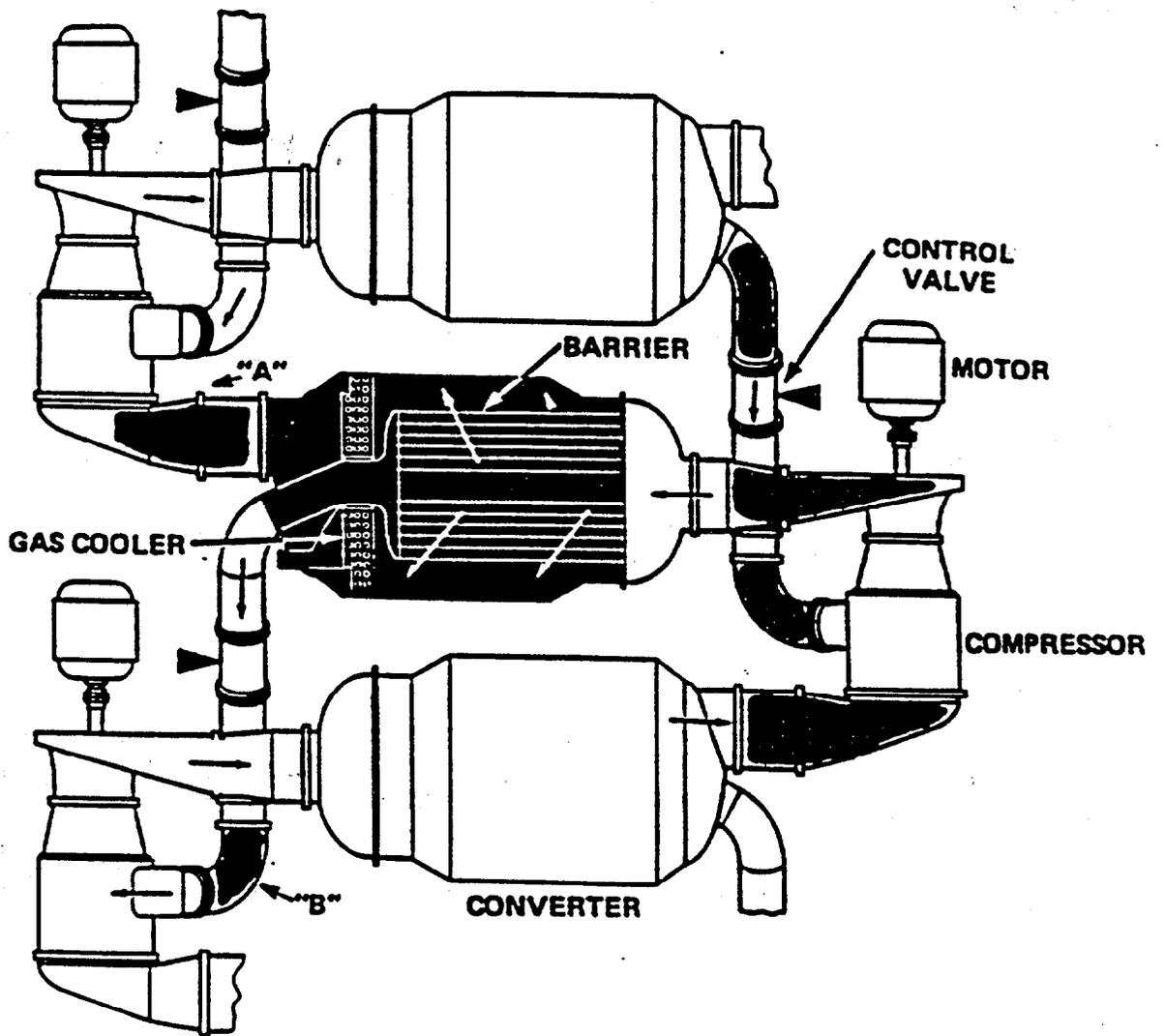


Fig. 1-1. Typical gaseous diffusion stage.

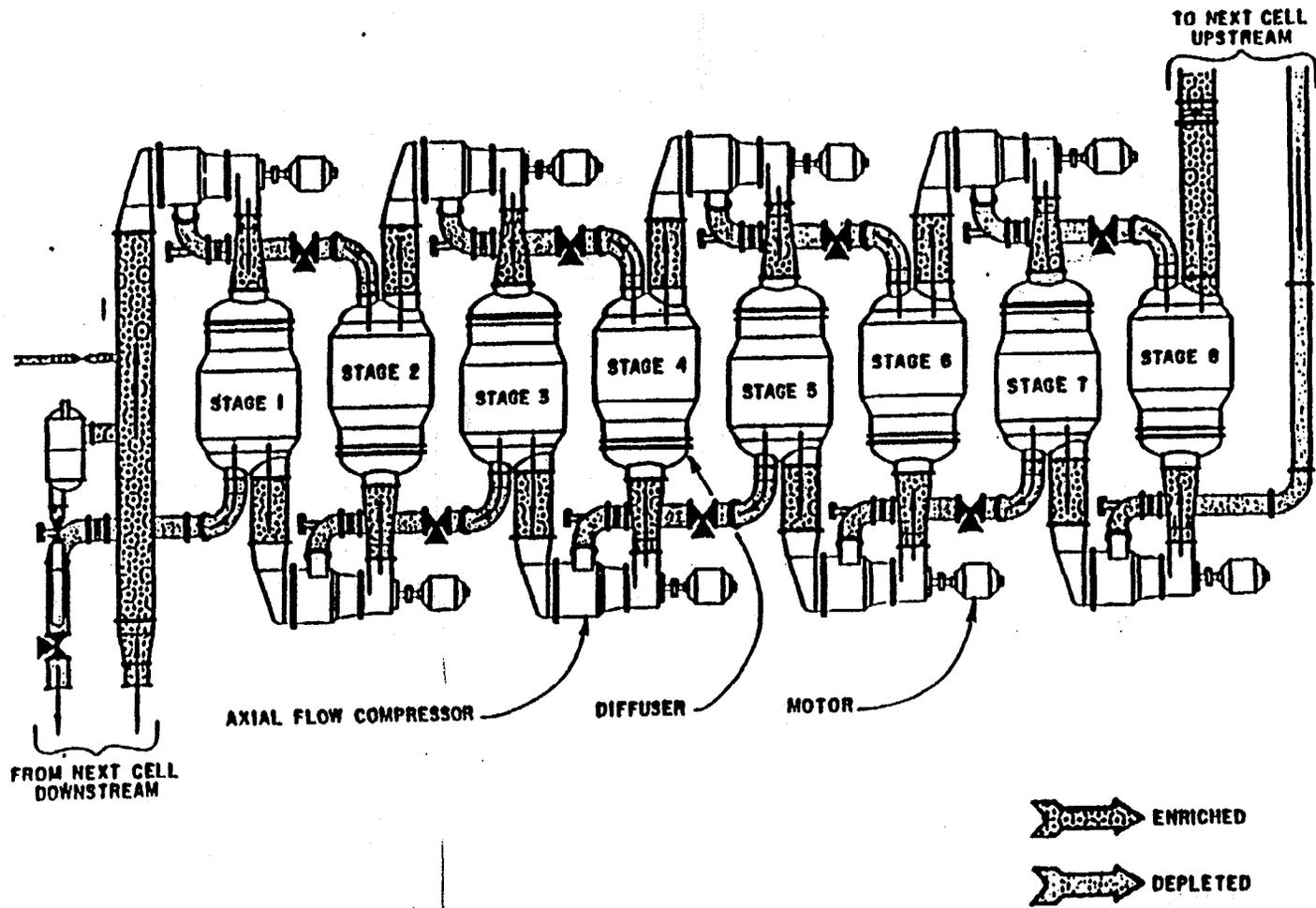


Fig. 1-2. Typical "000" gaseous diffusion cell.

1.2 BACKGROUND

The Energy Policy Act of 1992 transfers responsibility for the gaseous diffusion plants (GDPs) at Portsmouth, Ohio, and Paducah, Kentucky, from the Department of Energy (DOE) to the newly created United States Enrichment Corporation (USEC) effective July 1, 1993. The Act requires the Nuclear Regulatory Commission (NRC) to establish regulatory standards by October 1994 which the NRC will use to certify and regulate the GDPs. Until NRC assumes regulatory oversight for the GDPs, USEC will assume responsibility for the plants under DOE requirements and oversight for nuclear safety and safeguards and security.

DOE requirements for nuclear safety and safeguards and security are derived from the DOE Orders system. However, not all DOE Orders have nuclear safety or safeguards and security implications for the GDPs. Only those orders that address nuclear safety and safeguards and security requirements applicable to the GDPs are discussed in this report.

1.3 PURPOSE

The purpose of this report is to:

- define the essential nuclear safety and safeguards and security requirements for continued safe and secure GDP operations;
- outline the framework of nuclear safety and safeguards and security requirements for DOE oversight of GDP operations, which will continue until NRC assumes regulatory oversight of the GDPs;
- provide information to the NRC with respect to overall GDP safety; and
- provide information which may be useful to NRC in developing its regulatory standards for GDPs.

1.4 REPORT STRUCTURE

This report consists of five chapters including this introduction. Chapter 2 discusses the historically safe operation of the GDPs, the DOE oversight programs with respect to the GDPs and the safety characteristics of the plants as documented in safety analysis and hazards assessments. Chapter 3 defines safety objectives, Implementation Requirements to meet these objectives, the manner in which the Implementation Requirements are met and summarizes the status of conformance with these requirements. The GDPs will operate under DOE oversight with respect to these requirements until the NRC assumes regulatory oversight responsibility for the GDPs.

Chapter 4 describes the DOE oversight plan for nuclear safety and safeguards and security of the GDPs during the interim period, and Chapter 5 presents the conclusions drawn from the review.

2. SAFETY OF GDPs

The safety of PORTS and PGDP operations is demonstrated by the excellent nuclear and process safety record established by more than 40 years of operation at each of the plants and by the analysis of postulated accidents and anticipated operational incidents. In addition, through DOE's oversight and Energy Systems' corporate responsibility, numerous periodic and special reviews and assessments have been conducted to ensure continued safe operations. For safety significant incidents, internal and external investigations are systemically employed to ensure that incident precursors and root causes are identified and addressed to prevent recurrence.

This section describes the safety basis for current GDP operations through a discussion of the following:

- The early history of the DOE enrichment complex and the significant safety improvements at the plants, including those identified from analysis of significant incidents experienced within the complex;
- The low levels of off-site hazardous releases resulting from recent operating experience;
- The safety basis as described in the Safety Analysis Reports (SARs), including discussion of the hazards and accident scenarios;
- Maintenance of safety documentation;
- The limitations on plant operation contained within the Operational Safety Requirements (OSRs);
- The effects of plant aging on safety;
- Efforts to upgrade the safety documentation to meet current DOE requirements; and
- Historical DOE oversight of GDPs.

2.1 SAFETY DEMONSTRATED BY OPERATING HISTORY

PORTS and PGDP were constructed in the early 1950s to supply enriched uranium to both the United States Government Weapons Production Program and to the Atomic Energy Program. Through more than 100 years of collective operating experience (including the K-25 Site in Oak Ridge which operated from 1945 to 1985), the gaseous diffusion enrichment facilities have been characterized by an attention to process safety and have proven to be well designed for the wide variety of operating conditions that have been experienced.

During the more than 100 years of collective operating experience, no incidents at any of the GDPs have caused death or serious injury to plant personnel from exposure to radioactive materials or radiation. Likewise, no incidents at any of the GDPs have resulted in off-site releases of radiation or radioactive materials that could cause committed doses in excess of established limits. This excellent operating record attests to the quality of the safety measures designed into the GDPs and to the safety consciousness of facility personnel, particularly because much of this operating history occurred when the requirements for environmental protection, safety, and health protection were less stringent than they are today. The

safety consciousness during this period has also been enhanced by the incorporation into daily operations of the lessons learned from operating experience. Furthermore, DOE and the operating contractors have continually upgraded the technology at the GDPs to enhance safety, production capacity, and overall efficiency. These activities are described briefly in the following sections.

2.1.1 Early History

The first full-production-size GDP was built on the K-25 Site in Oak Ridge, Tennessee, as part of the original Manhattan Project in World War II. The gaseous diffusion processes at the K-25 Site are shut down and are no longer used to enrich uranium. Although the K-25 GDP performed safely throughout its entire operating life, the lessons learned from its early operations provided insights on design, construction, and operational improvements that were used to enhance safety at the two currently operating GDPs, built during the early 1950s. Examples of the enhancements incorporated in the design, construction, and operations of PORTS and PGDP include:

- surveys to detect uranium deposits in the process system,
- improvements in the handling of UF₆ cylinders;
- replacement of carbon chemical traps in the seal exhaust systems with alumina traps, eliminating a reaction threat; and
- installation of UF₆ containment autoclaves.

2.1.2 Cascade Improvement Program and Cascade Upgrading Programs

Although the enrichment complex was originally constructed to produce nuclear weapons-grade enriched uranium, the 1960s brought an added mission for these plants, the production of low enriched uranium (LEU) for civilian nuclear power plants. To fulfill this mission in an era of increasing orders for new civilian nuclear power plants and increasing demand for enriched uranium, the efficiency and capacity of the three GDPs were increased. The \$1.4 billion Cascade Improvement Plan (CIP) and Cascade Upgrading Program (CUP) significantly increased efficiency and capacity; both were initiated in the early 1970s and completed in the early 1980s. The CIP increased the separative efficiency of the GDPs through installation of more efficient gaseous diffusion barriers and larger equipment and by improving the flow of the uranium hexafluoride gas. The CUP increased the production capacity of the plants. For each change, technological improvements were made to the original design and construction of the GDP. The design of these upgrades also incorporated appropriate safety improvements based, in part, upon the GDP operating experience between the 1950s, when the plants were initially built, and the early 1970s, when the upgrades were designed and installed. Ultimately, the combined effect of the CIP and CUP programs was to increase the overall separative capacity of the GDPs by 58% at substantially lower cost than would be expended on designing and constructing equivalent new facilities. As part of these modifications, the following safety improvements were made to the plants:

- UF₆ leak detectors,
- double-wall bellows on thermal expansion joints, and
- improvements to compressor seals.

2.1.3 Formal Review of Operating Experience

In addition to the early lessons learned at the K-25 Site, the sharing of operating experience and the investigation of incidents have further enhanced the safety programs at PORTS and PGDP. Significant incidents have typically been the subject of formal, structured reviews that included a detailed review of the circumstances surrounding the events, and the identification of the root or apparent causes of the events, the development of corrective action(s) to prevent the recurrence of the particular events and similar events. DOE has initiated and led reviews of the more significant events. In many other cases, DOE did not deem the event to be sufficiently significant to merit a DOE-led review, and the DOE Management and Operations (M&O) contractor for the sites (presently Martin Marietta Energy Systems, Inc., previously Union Carbide for PGDP and K-25 until 1984, and Goodyear Atomic for PORTS until 1986) conducted the reviews. Two significant incidents which were examined in this manner are described below as examples of this process.

<u>Event</u>	<u>Corrective Action</u>	<u>Safety Improvement</u>
Hydrocarbon oil reacted with liquid UF ₆ in a cylinder at K-25 in 1975. The cylinder ruptured, but less than 20 pounds of UF ₆ were released. No irreversible health effects to plant workers and no off-site releases above established limits occurred.	Use of hydrocarbon oil sealed pumps without an in-line trap which can hold the entire oil contents of the pump to purge cylinders was prohibited.	The risks of UF ₆ reaction and of personnel exposure to UF ₆ were reduced.
A 14-ton UF ₆ cylinder (in liquid state) was dropped from a straddle carrier and ruptured at PORTS in 1978. No irreversible health effects to plant workers and no off-site releases above established limits occurred.	Maintenance practices for straddle carriers were improved, administrative controls to enhance the safety of cylinder moves were designed, and subsequently procedures were revised to prohibit moving UF ₆ cylinders in the liquid state with straddle carriers.	The risk of cylinders being dropped during handling and of personnel exposure to UF ₆ was reduced.

In addition to conducting formal reviews of specific incidents, representatives of the operating plants (including K-25 when gaseous diffusion operations were being conducted there) and technical experts have been meeting regularly to share the lessons learned from operating experiences related to safety and operational issues.

More recently, the DOE requirements have been changed to institute a more formal process of reporting safety significant occurrences throughout the DOE complex. These requirements, which include the investigation of root cause(s), the development of corrective actions, and the preparation of initial and follow-up reports, are described in Sect. 3.2.

2.1.4 Recent Operating Experience

Both sites have active programs to monitor and control environmental releases and personnel radiation exposures. These programs include extensive requirements for reporting to DOE (e.g.,

performance indicators and annual environmental reports) and responsible environmental protection agencies. As shown in the following paragraphs, PGDP and PORTS release only a minute quantity of the UF_6 handled every year and release minimum quantities of radionuclides; therefore, individual exposures are limited to extremely low doses of radioactivity.

2.1.4.1 Uranium Releases

The quantity of uranium released to the atmosphere has decreased significantly in recent years (as shown in Fig. 2-1) because procedure development, training, and conduct of operations have been emphasized. Aside from the 14-ton cylinder release at PORTS in 1978 (which is discussed in Sect. 2.2.2.2), the release data demonstrates the effectiveness of the application of lessons learned by the decreasing trend of the release quantities. More than 95% of the total releases occurred before 1970. Less than 1% of the total releases has occurred in the last 12 years.

2.1.4.2 Radionuclides

Radionuclide Releases

Radionuclide release monitoring programs are designed to comply with federal and state environmental regulatory requirements and DOE Orders. To ensure compliance, potential and actual sources of any releases must be identified, controls must be implemented to abate emissions within specified limits, and routine measurements must be taken to demonstrate compliance. Plant emissions must comply with National Emissions Standards for Hazardous Air Pollutants (NESHAP) as mandated by EPA. The NESHAP standard for air emission from plant operations at the GDPs is 10 mrem/year.

Atmospheric Releases of Uranium

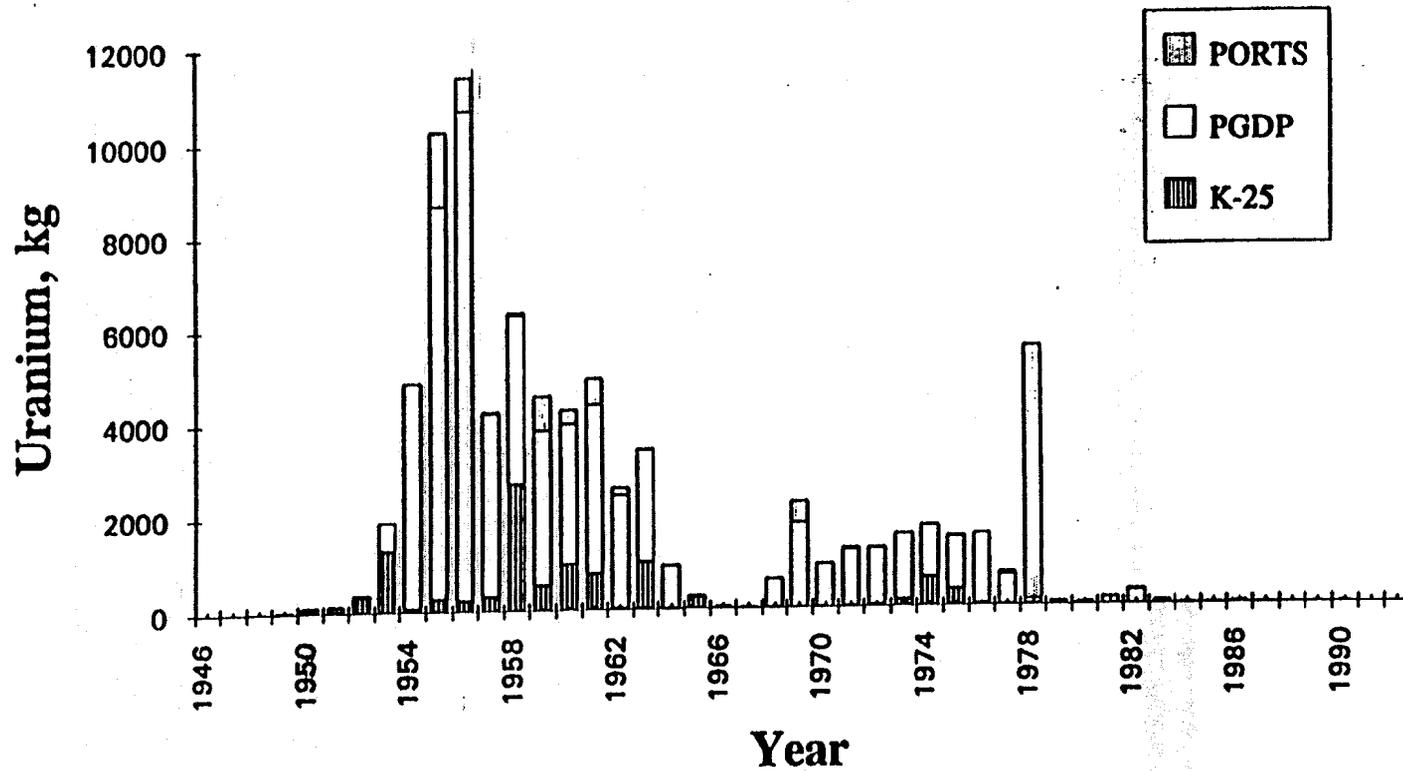


Fig. 2-1. Uranium releases to the atmosphere.

Air Releases

A risk-equivalent dose equivalent is used to estimate health effect risks to exposed persons and to the public from GDP operations. The effective dose equivalent (EDE) is a weighted sum of dose equivalents to specified organs. During the last several years, the maximum potential 50-year committed EDE to any individual from airborne emissions has been a fraction of a millirem in any one year. Thus, the releases to the public have been well below the NESHAP standard allowable limit of 10 mrem/year.

Waterborne Releases

Waterborne radionuclide emissions are monitored through the National Pollutant Discharge Elimination System (NPDES) process. Measured plant discharges have insignificant to no noticeable effect on radioactivity levels in the receiving waters. Conservative estimates of EDEs from waterborne discharges are much less than the Environmental Protection Agency (EPA) public drinking water limit of 4 mrem/year for beta-emitting radionuclides in a public water supply and are much less than the DOE limit of 100 mrem/year for all exposure pathways (waterborne plus airborne).

2.1.4.3 Exposure levels

Radiation levels at the GDPs are inherently low, and both sites include all on-site workers in personnel monitoring programs. As shown in Figs. 2-2 and 2-3 for PGDP and PORTS, respectively, the average doses for personnel are on the order of several mrem, and the cumulative dose received on-site by all personnel is normally less than 25 person-rem per quarter. The average dose per person on-site has been less than 10 mrem for both sites for the past 2 years and generally no more than a few tenths of mrem. The maximum annual deep penetrating dose for each plant is on the order of 250 mrem.

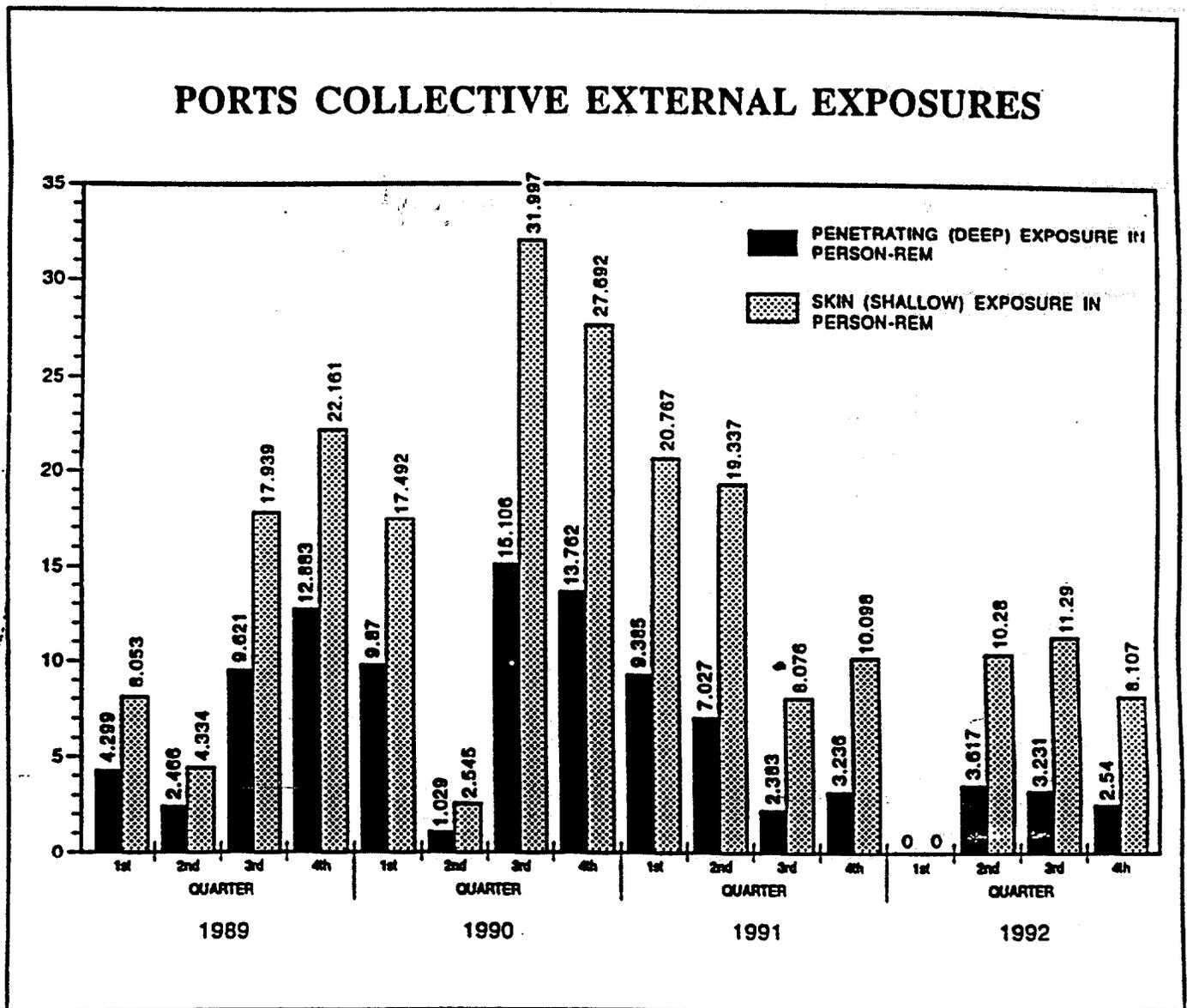
This dose is inconsequential when compared to the current annual exposure limit, 5000 mrem for the DOE and the NRC per DOE Order 5480.11 and per 10 CFR Part 20 (NRC requirement). Note that typically PORTS personnel receive a higher dose than PGDP personnel. This is due to the handling of higher assay material at PORTS than PGDP.

2.2 SAFETY ANALYSIS SUMMARY FOR THE GASEOUS DIFFUSION PLANTS

Documented safety analyses of nuclear and nonnuclear operations and facilities have been required for many years. In response to these requirements, various safety analyses have been conducted in conjunction with overall plant evaluations, specific modifications, and operational occurrences. Since the initial requirements relating to safety analysis were issued, DOE has modified its requirements in this area to require increased documentation rigor and formality and to reflect the evolution of safety analysis techniques. The current requirements for the performance and documentation of safety analyses are described in Sect. 3.17.

This section (1) summarizes the types of potential hazards associated with GDPs that could affect public health and safety; (2) presents an overview of the analyses of postulated accidents and abnormal conditions presented in the Final Safety Analysis Reports (FSARs) for PORTS and PGDP, which demonstrate that the GDPs can be operated safely and which, in conjunction with the OSRs, provide an envelope for safe operations; and (3) discusses the measures employed to address the

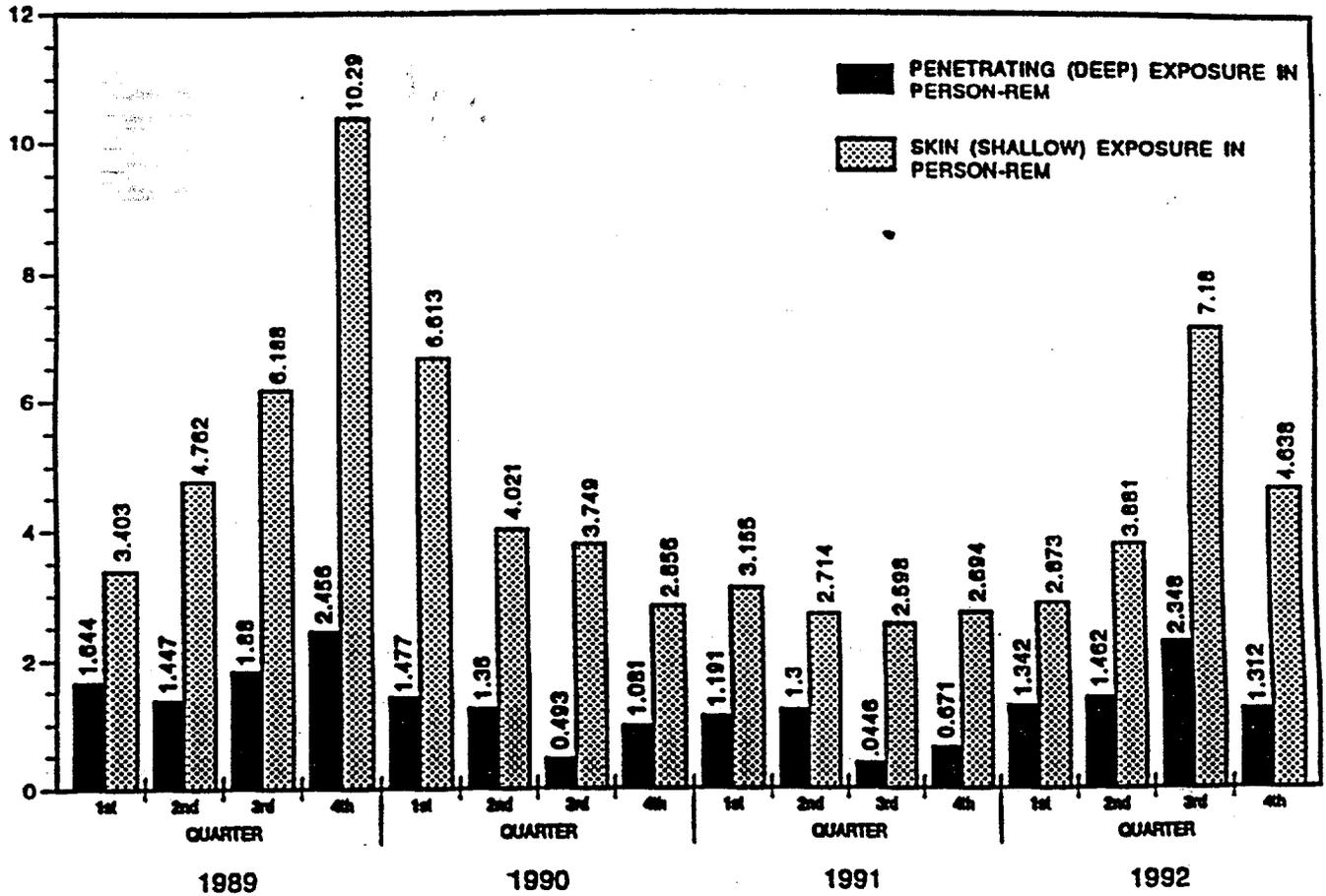
PORTS COLLECTIVE EXTERNAL EXPOSURES



SH103

Fig. 2-2. PORTS Collective External Exposures.

PGDP COLLECTIVE EXTERNAL EXPOSURES



SH104

Fig. 2-3. PGDP Collective External Exposures.

potential impact of aging on plant safety. Because DOE's safety analysis requirements have changed since the issue of the FSARs, this section also includes a brief description of efforts underway to enhance these analyses to comply with the current DOE requirements.

2.2.1 Gaseous Diffusion Plant Hazards

UF₆ is the primary hazard of concern at the diffusion plants. Principally, this is because of the chemical toxicity of UF₆ and its reaction products and because of the radioactivity and toxicity of uranium. In addition, in a UF₆ release to the atmosphere, UF₆ reacts exothermically with water vapor in the air to create HF which is a highly toxic material. A previous NRC study compared the toxicity of uranium and HF to 10 CFR Part 100 off-site radiation guidelines, which NRC uses for reactor regulation. These comparisons and studies performed for releases of large quantities of UF₆ revealed that the primary concern to the health and safety of the public is the chemical toxicity of UF₆ and its reaction products. Thus, any significant risk to the health and safety of the public would arise from the chemical toxicity of the materials used in the operation of the GDPs rather than from their radioactive properties. Nevertheless, radioactive properties of uranium have been considered in the safety analyses.

Table 2-1 lists the major potential hazards involved in the current operations of the GDPs. These hazards represent a compilation of the hazards considered in each plant's SAR and the Justification for Continued Operation reports for each plant completed subsequent to the SARs.

Table 2-1. Major Potential Hazards at GDPs

Hazard	Initiator or operation	Consequence	Potential off-site Effects? ¹
Fire	Lube oil system	UF ₆ release	Yes
	Transformer/capacitor	PCB release	Yes
Radiation Contamination	Normal operations	Uranium compounds	No
		Technetium	No
	Maintenance	Transuranics	No
		Inadvertent Criticality	Radiation burst
Explosion	Equipment failure	acetylene in N ₂ system (PORTS only)	No
	Support/control system failure	see chemicals below	Yes
	Operator error		
	Natural phenomena		
	Hydrocarbon oil liquid UF ₆	UF ₆ release	Yes
Chemicals	Equipment failure	ClF ₃ release	No
	Support/control system failure	F ₂ release	No
		HF release	Yes
		Freon release	No
	Operator error	UF ₆ release	Yes
	Natural phenomena	Release of Uranium compounds	No

¹The potential off-site effects column reflects a conservative assessment of unmitigated consequences for postulated bounding accidents involving the subject hazards.

²Criticality events do not result in direct radiation consequences off-site.

Criticality events are not considered to have a potential impact on the public. Because criticality produces primarily local radiation effects, the expected consequences are limited to the on-site workers with no off-site effects to the public health and safety. No significant fission product release and transport are anticipated from an inadvertent criticality event.

Each of the potential hazards is discussed further in the following sections.

2.2.2 Safety Analysis Reports

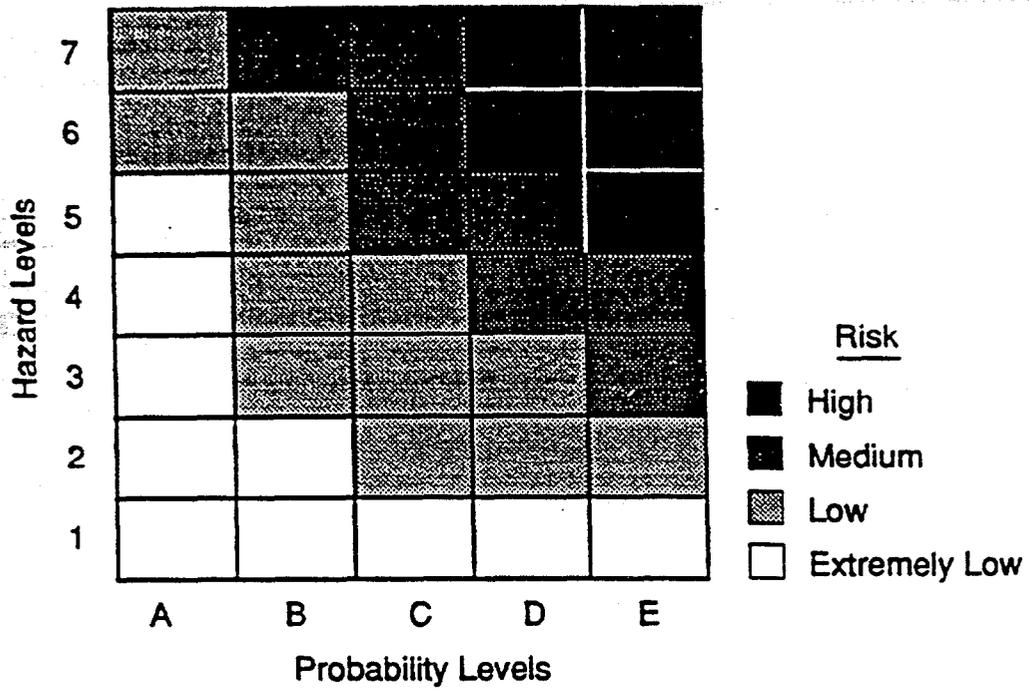
PGDP and PORTS each has produced a FSAR between 1980 and 1985, in accordance with DOE Orders 5480.1A and 5481.1A. These orders were the governing requirements for safety analysis at that time. (See Sect. 2.4.) These documents identify the major safety events (major hazards, initiators, and sequences) and establish an envelope for safe operations, which is defined in the OSRs. The FSARs analyzed the unique risks associated with the operation of the GDPs, examined the impact of these hazards during accident and process upset conditions, and evaluated the risk to both on- and off-site personnel.

During FSAR development, significant reliance was placed on operational experience, engineering judgment, an in-depth understanding of the overall operation and associated hazards, and senior staff with first-hand experience and understanding of the theory and operations. Credible accident scenarios were developed by (1) examination of previous accident reports and reports of significant events, (2) discussions with personnel possessing extensive practical knowledge of plant operations, and (3) engineering analyses of theoretical situations. Maximum credible consequences associated with on- and off-site personnel exposure to toxic materials and radionuclides were also analyzed. In the absence of comprehensive reliability data for GDP systems and components, many of which are unique to the GDPs, estimates of the likelihood of postulated accidents were made, based upon engineering judgment, to permit the qualitative evaluation of risks. The FSARs detail the rationale for these estimates.

The guidelines used for the qualitative risk determination are provided in Fig. 2-4 and Table 2-2. The risk of the individual events postulated is defined by the probability and consequence of each event.

2.2.2.1 Important operational parameters

The two most significant parameters related to safe operations of the GDPs are maximum cascade power level and ^{235}U assay. Power level principally determines the cascade operating pressure, in-process UF_6 inventory, and the production level of the plant. The maximum power levels are 3040 MW for PGDP and 2100 MW for PORTS. Assay levels also relate to the risk of an inadvertent criticality; as a general rule, the higher the assay, the smaller the amount of material required for criticality. The maximum assay production is 2% for PGDP and less than 20% for PORTS. PGDP is performing modifications and analyses to increase its maximum assay to 5%. PORTS, before the suspension of highly enriched uranium (HEU) production in 1992, could produce assays greater than 90%.



Probability Scale	Estimated Range of Probability of Accident Occurrence, per year
E Extremely high	$p \geq 1.0$
D High	$10^{-1} \leq p < 1.0$
C Medium	$10^{-2} \leq p < 10^{-1}$
B Low	$10^{-3} \leq p < 10^{-2}$
A Extremely low	$p < 10^{-3}$

Fig. 2-4. Risk matrix used in FSAR.

Table 2-2. Hazard rating scale¹

Hazard Level	Maximum Consequence
7 CATASTROPHIC	Extremely serious on- and off-site impact for lengthy periods of time
	Large geographical areas and large population groups affected
	Large number of fatalities, both on- and off-site
6 EXTREMELY HIGH	Extremely serious on-site impact to large numbers of people and to the environment
	Many on-site fatalities and possible fatalities to the public located on adjacent properties
	Moderate impact beyond the exclusion area ²
5 HIGH	Extremely serious on-site impact and considerable impact on the environment
	Multiple fatalities among operating and other on-site personnel
	Moderate health and safety concerns to the public located close to the site
	Minor impact off-site beyond the exclusion area
4 MEDIUM	Serious on-site impact and significant impact within the exclusion area and to the environment
	Fatality, severe injury, or severe illness to operating personnel
	Significant health concern to workers at nearby facilities
	Few people off-site seriously affected
3 LOW	Significant on-site but only minor off-site impact
	Moderate injury or creation of moderate health concerns for operating personnel
	Minor health and safety concerns for nearby facility workers
	Slight contamination of off-site environs
2 EXTREMELY LOW	Minor on-site but no off-site impact
	Slight injury or illness to operating personnel
	Local facility contamination requiring only routine procedures to control or correct
	No health and safety concerns for workers at nearby facilities
1 NEGLIGIBLE	Detectable on-site and no off-site impact
	No identifiable safety and health consequences
	Negligible contamination of the environment

¹This is the hazard rating scale used in the PORTS and PGDP FSARs.

²Exclusion area is the area surrounding the facility in which the owner has the authority to determine all activities, including exclusion or removal of personnel and property from the area.

The operating pressure is important in the event of a process system boundary breach. Most stages of the cascade operate at pressures below atmospheric pressure. At operation above atmospheric pressure, leakage of UF_6 to the environment is possible. To estimate the potential for UF_6 releases from the cascade, the pressure distribution in the cascade should be understood.

The cascade pressure distribution is determined by power level, cascade configuration (number and location of on-stream cells), and, to a lesser extent, depleted and product withdrawal assay. To perform this process function, the compressors add significant amounts of energy to the UF_6 process gas. As a consequence, the process pressure in each stage is highest at the outlet of the compressors. Based on the overall cascade arrangement, the highest pressures within the cascade are in the larger equipment sections of the cascade. In a typical stage, the pressure drops significantly through the barrier for the "A" or enriched stream such that this portion of each stage throughout the cascade is less than atmospheric pressure up to the next higher compressor in the cascade. The "B" or depleted stream does not experience as significant a pressure drop through the converter as the "A" stream does. In some portions of the cascade, the "B" stream may be entirely above atmospheric pressure at higher power levels. For a typical stage operating above atmospheric pressure, approximately 30% of the process boundary surface area will experience this higher pressure, while the remaining 70% area will experience substantially less pressure and always remain subatmospheric. To illustrate this reaction, Fig. 2-5 shows a typical stage with representative high pressures. In this figure, the "B" stream pressure is approximately 18 psia while the "A" stream pressure is less than 4 psia. Even under maximum "B" stream pressure conditions of approximately 20 psia, significant portions of the cascade operate at subatmospheric pressures. Also, should the cascade be shut down, system pressure will fall to below atmospheric, regardless of initial operating power level.

To illustrate the power level conditions under which the plants typically operate, Fig. 2-6 shows the peak monthly power levels for each plant for the last several years. These data show that PGDP has operated well below its rated power level for this time period, and PORTS has operated near its rated power level. Figures 2-7 and 2-8 show the general arrangement of the cascades and representative average high-side pressures for rated power levels at PGDP (3040 MW) and PORTS (2100 MW), respectively. For PGDP, which has typically operated well below rated power, Fig. 2-9 shows the pressure for a representative power level (1600 MW) for operation during the last few years. At this power level, the typical pressure distribution shows that the entire cascade will likely be below atmospheric pressure. In fact, PGDP has not operated above atmospheric pressure since 1978. PORTS has operated portions of its cascade above atmospheric pressure; however, Fig. 2-10 shows that only a small portion of the cascade will be above atmospheric at 1900 MW, which is more typical of PORTS operation over the last 2 years.

If a breach in the process system boundary occurs during below-atmospheric-pressure operation, air will leak into the cascade. Air inleakage presents an operational upset condition which the operators are well trained to mitigate and correct. Upon recognition of excessive inleakage, the operators deenergize the compressor motors in, and isolate, the affected cell. Air inleakage will be noted by operators and indicated by changes in the compressor motor load and the highly sensitive line recorders. Operators in both the Area Control Room (ACR) and in the Central Control Room (CCR) have instrumentation to alert them to inleakage. Both ACR and CCR personnel can initiate shutdown.

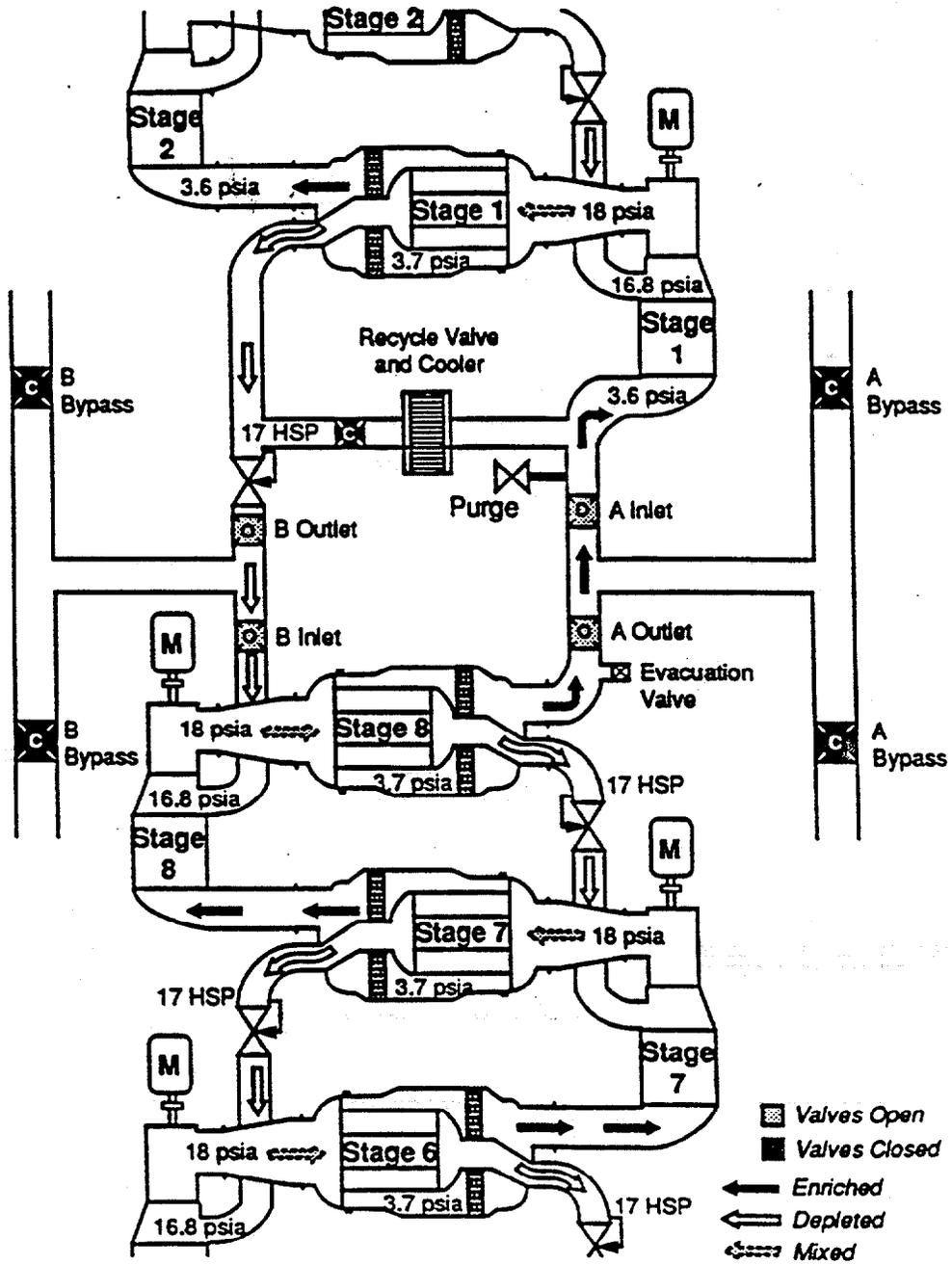


Fig. 2-5. Typical stage operating pressure.

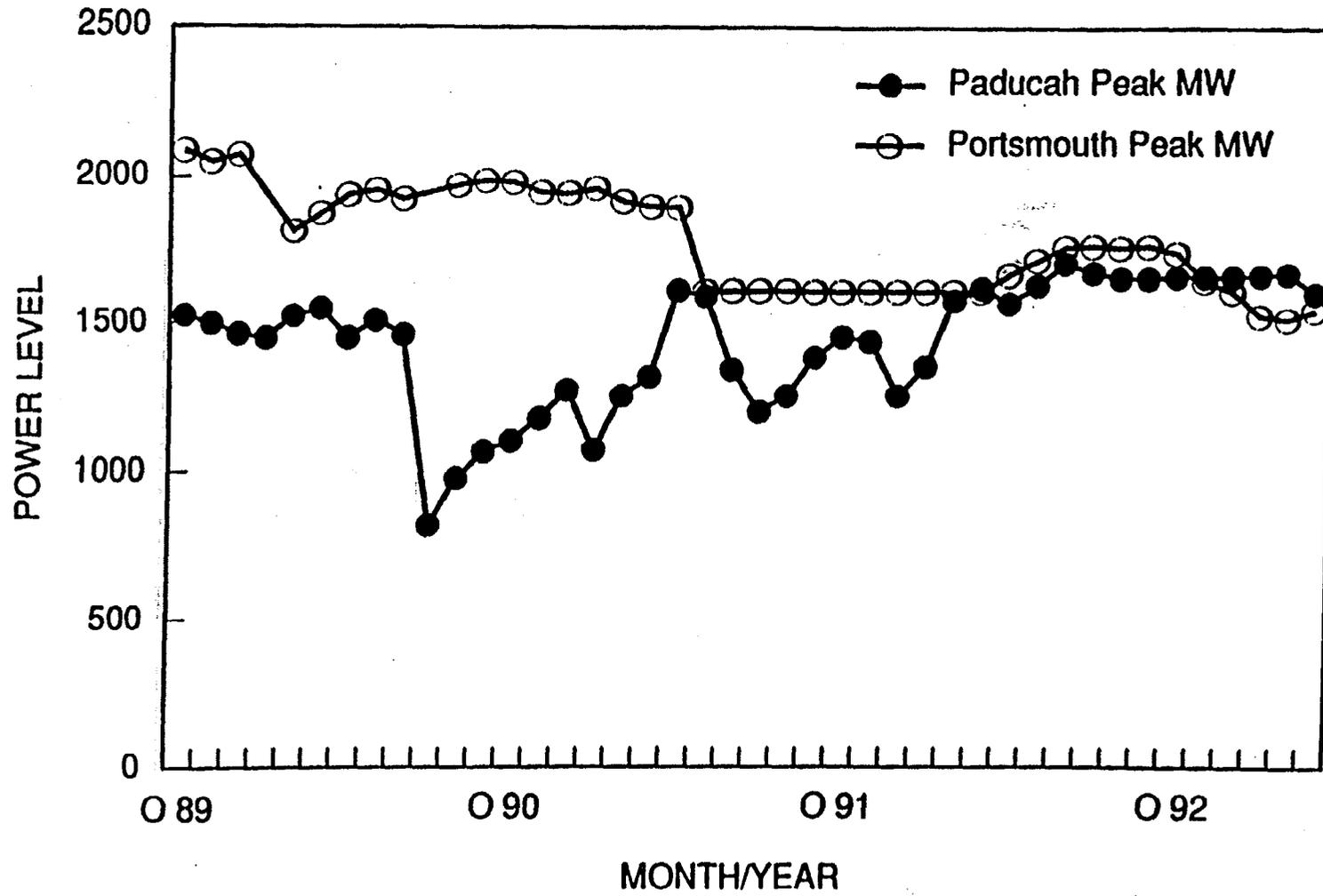


Fig. 2-6. Plant peak power usage.

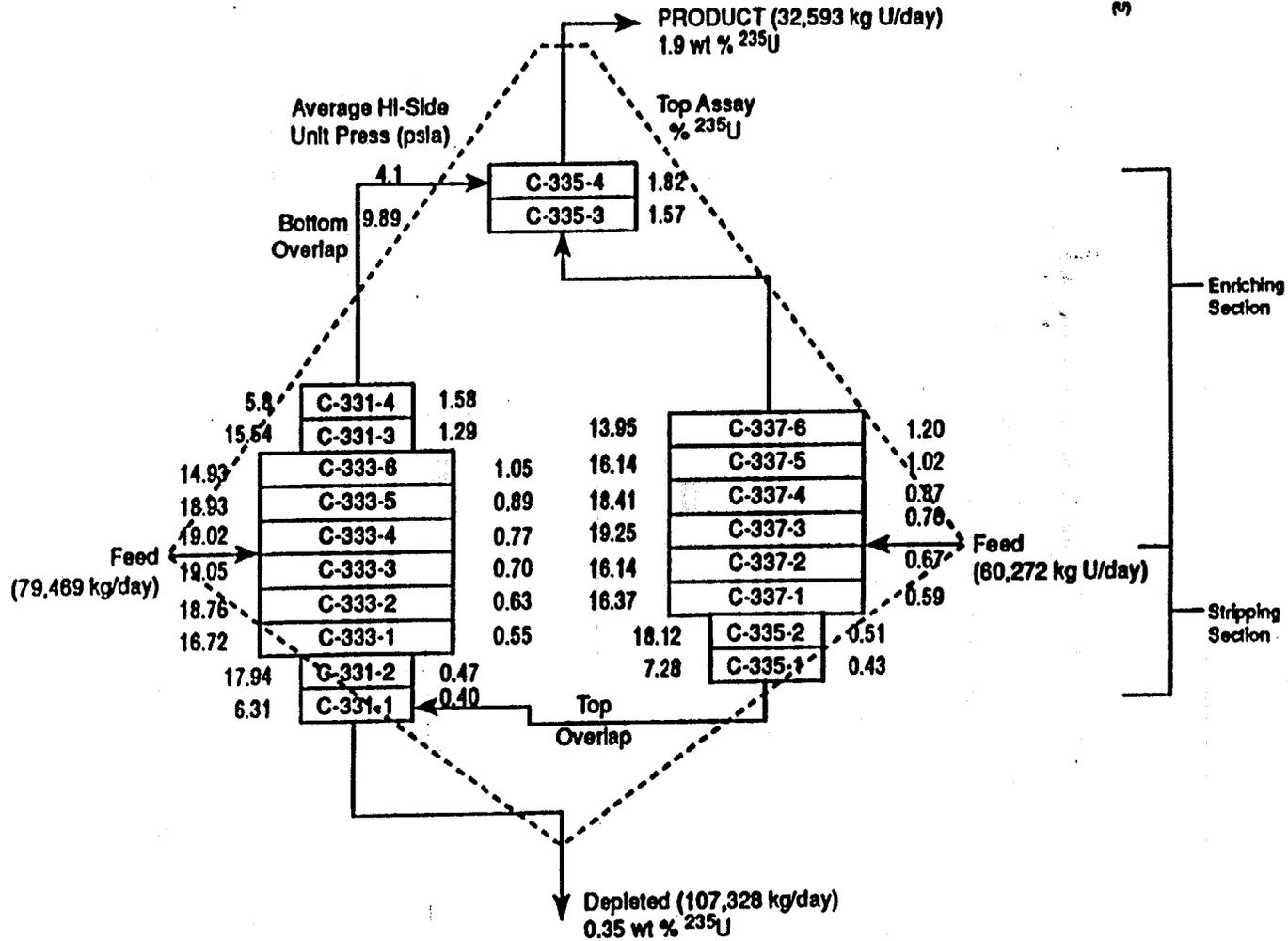


Fig. 2-7. Typical Paducah cascade configuration and conditions at 3040 MW2-17.

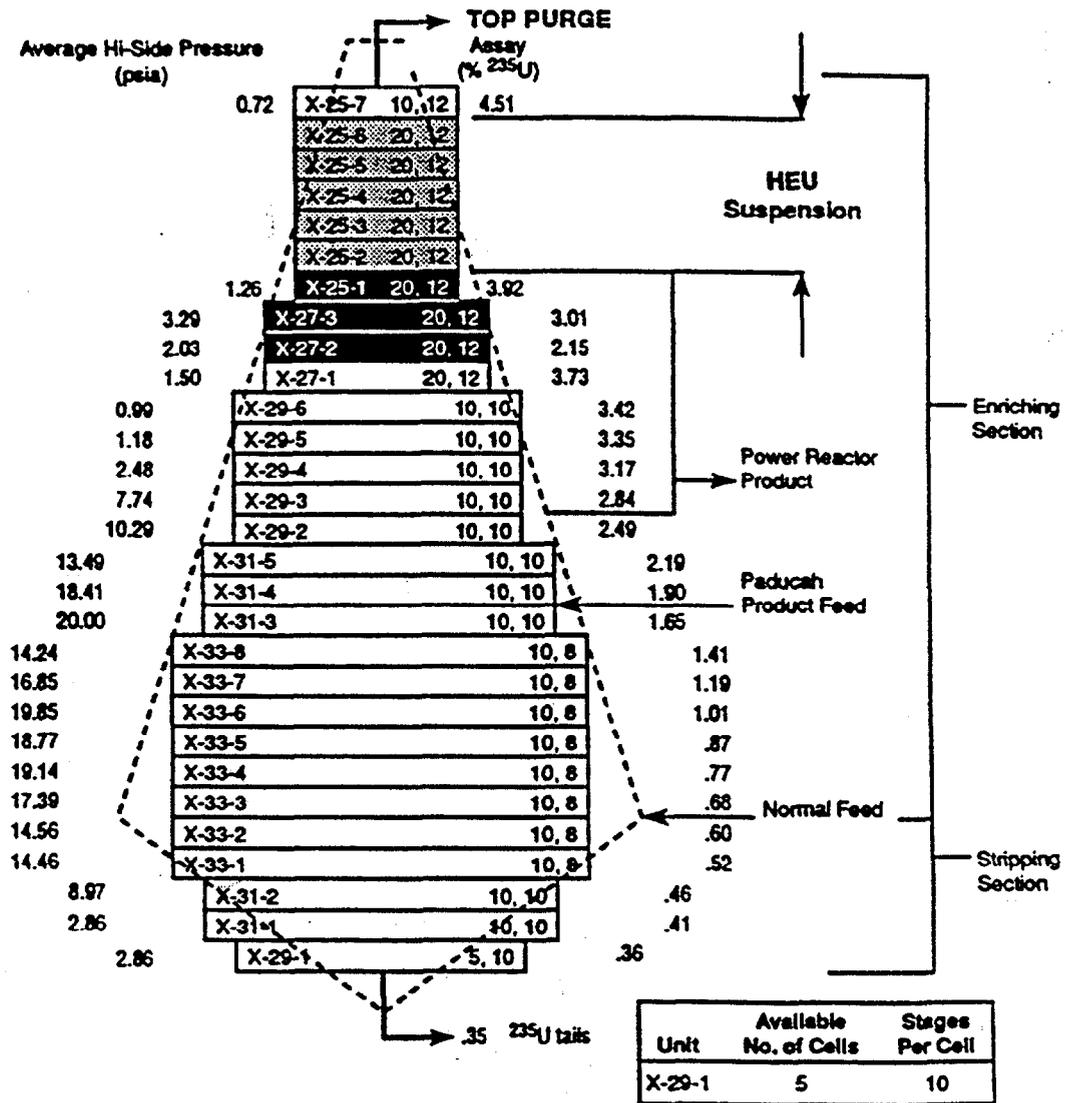


Fig. 2-8. PORTS typical cascade flow, pressure, and average assays at 2100 MW.

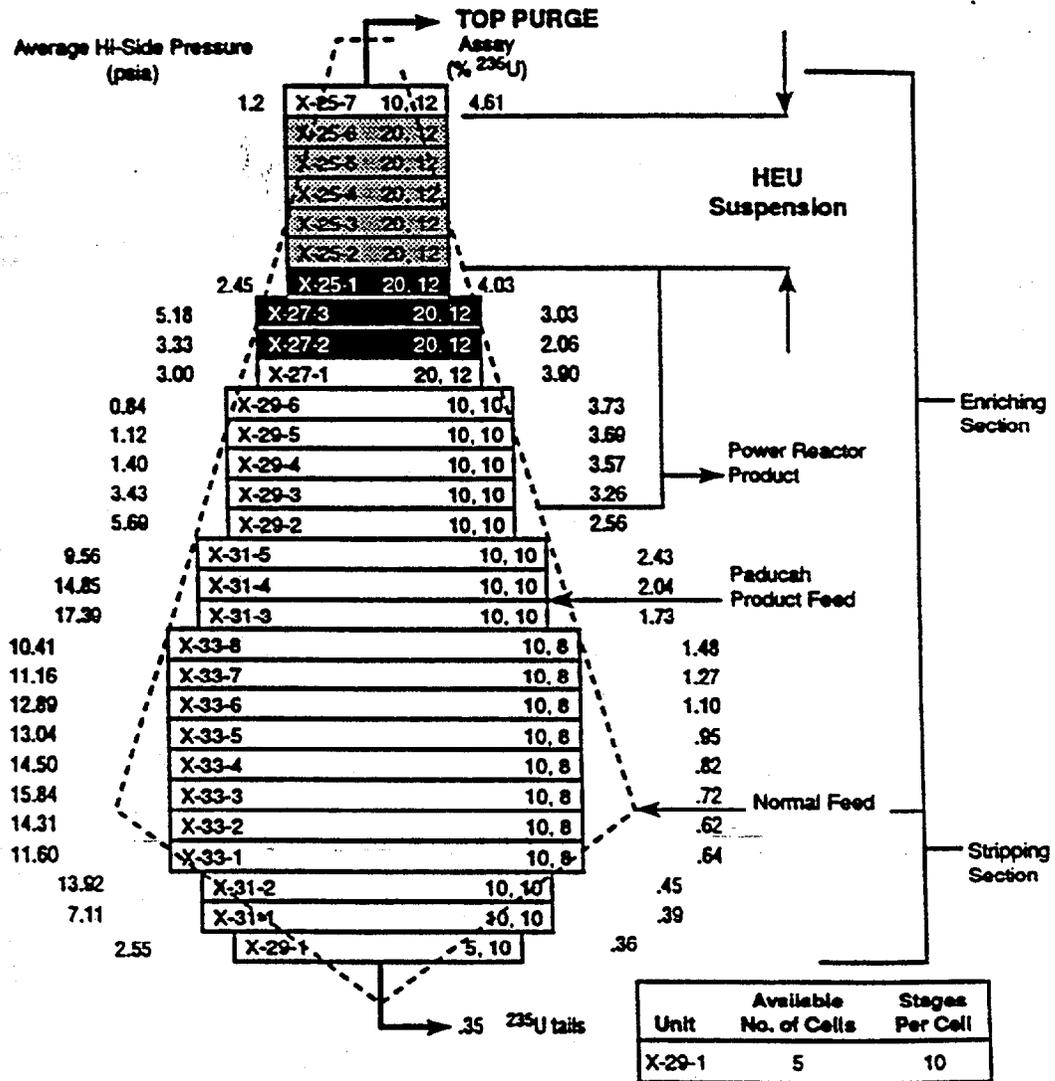


Fig. 2-10. PORTS typical cascade flow, pressure, and average assays at 1900 MW

As further precautions against the release of UF_6 , the plant design includes a secondary confinement scheme for potentially sensitive components in areas of the cascade that may be operated above atmospheric pressure. Specifically, the expansion joints, which are the most likely leakage points in the process piping, are double-bellows type designs; the space between the bellows is air pressurized with dry plant air to pressures greater than the process pressure, which ensures inleakage rather than UF_6 outleakage. Also, UF_6 leak detectors are provided in these areas; they alarm in the ACR and CCR to alert the operators if a UF_6 leak occurs. These detectors are provided in the cell enclosures and above the compressor discharge seals and must be operational or have other precautionary measures (e.g., operator watch) available in their place before the GDP can be operated at pressures above atmospheric.

Finally, in the event of leakage during operations at above atmospheric pressure, the operators must isolate the affected cell and deenergize the affected cell's compressor motors. This action immediately drops the pressure throughout the cell to below atmospheric pressure. The drive motors for the compressors in each cell are electrically connected so that when one compressor motor is tripped, all compressor motors in the cell are tripped. The expected UF_6 releases from a process system rupture are discussed in Sect. 2.2.2.2 under "Other UF_6 Releases."

2.2.2.2 Gaseous diffusion plant accident scenarios

The postulated accident scenarios developed in the existing FSARs were based on consideration of initiating events including (1) operator error, (2) equipment failure, (3) loss of support system, (4) fire, (5) explosion, (6) natural phenomena, and (7) the impact of events at adjacent facilities. Based on these considerations, the data in Tables 2-3 and 2-4 summarize the accident scenarios for the two plants and the relative risk of these accident scenarios. The accidents may be grouped by accident type or by facility. The more consequence-significant incidents will be discussed in the following paragraphs to provide the basis for risk categorization. These scenarios demonstrate the depth of analysis with regard to the subject hazards and scenarios.

UF_6 Release from Cylinder

The out-of-doors rupture of a 14-ton cylinder containing liquid UF_6 is generally regarded as the event that presents the highest risk. This highest risk status is caused by the rapid releases observed during previous events involving liquid cylinders and by the calculated consequences from a worse-case event. Since liquid UF_6 cannot exist at atmospheric pressure, when liquid UF_6 is released from a cylinder, approximately 70% of the liquid mass vaporizes and the remaining 30% solidifies. The UF_6 vapors then react with moisture in the air to generate HF. For every mole of UF_6 reacting, 4 moles of HF are formed. Both UF_6 and HF are toxic chemicals that potentially threaten on-site workers and the public health and safety.

Both plants typically allow liquid cylinders to cool out of doors because in-doors storage capacity is limited. When cylinders are transported from sampling or withdrawal operations to cooldown locations, liquid-filled cylinders with the valves protected are only handled by overhead cranes. Liquid-filled cylinders are moved, in general, at as low a height as possible, usually on the order of 1 foot, to minimize damage if the cylinder is dropped. Cylinders are placed on cradles and are appropriately spaced to ensure that no interference or contact between cylinders that might threaten cylinder

Table 2-3. Toxic material release accident scenario summary.

Accident Scenario ¹	Relative Risk ²
UF₆ RELEASE SCENARIOS	
Enrichment Facilities	
<u>Cell Overheat</u>	
Loss of Instrument Air	Extremely Low
Loss of RCW	Extremely Low
Operator Drains Coolant	Extremely Low
Improper Manual Control of Coolant System	Extremely Low
Compressor Failure	Extremely Low
<u>Cell Overpressure</u>	
"B" Stream Block Valve Closure - Onstream	Extremely Low
Stage Control Valve Failure (non-trimmer valves) - Onstream	Extremely Low
Recycle Valve Failure - Offstream	Extremely Low
Pressure Instrument Failure or Instrument Line Freeze Out	Extremely Low
<u>Mechanical Containment Breach</u>	
Heavy Equipment Drop on "B" Line	Extremely Low
Vehicular Impact	Extremely Low
Fatigue Failure of Process Piping	Extremely Low
Motor Coupling Failure	Extremely Low
Compressor Seal Failure	Extremely Low
Treatment Gas Explosion	Extremely Low
Seismic Event	Low
Expansion Joint or Weld Joint Failure	Extremely Low
<u>Local Fire</u>	
Lube Oil Fire	Extremely Low
<u>Operator Error</u>	
Improper Purging of Process System	Extremely Low
Evacuation Jet Valving Error	Low
Purge Cascade	
Failure to Obtain UF ₆ Negative	Low
Misvalving to Ejector Station	Low
Freezer/Sublimer Systems	
Stress Rupture of Freezer/Sublimer Vessels	Extremely Low
Cold Recovery (PORTS only)	
UF ₆ /ClF ₃ Due to Overpressure by Plant Air	Low
UF ₆ /ClF ₃ Through Jet Exhauster Misvalving	Extremely Low
ClF ₃ /Freon Explosion	Extremely Low
UF ₆ Release from Al ₂ O ₃ Traps	Extremely Low
UF ₆ Release Due to Cold Trap Overpressure	Extremely Low
Explosion of ClF ₃ Reaction Products	Extremely Low
UF ₆ Release Due to Venting Holding Drums	Extremely Low

Table 2-3. (continued)

Accident Scenario ¹	Relative Risk ²
UF₆ RELEASE SCENARIOS	
UF₆ Feed, Withdrawal, Sampling, and Handling Facilities	
14 Ton Cylinder Rupture - Inside/Outside Release	Low
Cylinder Pigtail Failure - Inside Release	Low
Cylinder Valve Failure - Inside/Outside Release	Extremely Low
UF ₆ -Hydrocarbon Oil Explosion	Extremely Low
Fatigue Failure in Withdrawal Area - Inside Release	Low
Compressor Seal Failure in Withdrawal - Inside Release	Extremely Low
Overpressure of Discharge Bellows on Normetex Pump - Inside Release (PGDP)	Extremely Low
Fatigue Failure on Discharge Side of Normetex Pump - Inside Release (PGDP)	Extremely Low
Compressor Failure Due to Thermal Reaction - Inside Release	Extremely Low
Fatigue Failure of Accumulator Drain Line - Inside Release	Extremely Low
Fatigue Failure of Accumulator Instrument Line - Inside Release	Extremely Low
HF OR F₂ RELEASE SCENARIOS	
Temporary HF Transfer Pipe Rupture	Low
HF Transfer Pipe Rupture	Low
HF Venting Error at X-344E (PORTS)	Extremely Low
Release at HF Vaporizer in X-342A (PORTS)	Low

¹Note that in general these events apply to both plants. Each of these events, however, may not have been considered at both plants and documented in one or both of the respective FSARs.

²See Fig. 2-4.

Table 2-4. Criticality accident scenario summary.

Accident Scenario	Relative Risk
PORTS CRITICALITY SCENARIOS	
Enrichment Facilities	
A-Line Cooled Cell, Top Stage Freeze Out	Extremely Low
Lube Oil Inleakage Through the Labyrinths of Compressor Bearings and Process Seals	Extremely Low
UF ₆ Freeze Out in Piping Elbows, B-Line Drops, and Building Tie Lines	Extremely Low
Wet Air Inleakage	Extremely Low
Prolonged Power Failure	Extremely Low
Water Control Valve Leak and Cell Block Valve Leak on Shutdown Cell	Extremely Low
UF ₆ Freeze Out in Interbuilding Booster Station	Extremely Low
Equipment Removal for Maintenance	Extremely Low
Solid Mass in X-330 or X-333 Evacuation Booster Station	Extremely Low
Stage Compressor Vibration and X-Joint Rupture	Extremely Low
Exothermic Reactions Resulting in Uranium Compound Deposits	Extremely Low
Purge Cascade	
Dry Solid Mass of UF ₆	Extremely Low
Dry Mass of UO ₂ F ₂	Extremely Low
Moderated Solid Mass - UF ₆ or UO ₂ F ₂	Extremely Low
Cold Recovery	
Criticality in X-333 8" Cold Trap	Extremely Low
Criticality in X-330 5" Cold Trap	Low
Criticality in X-333 24" Al ₂ O ₃ Trap	Extremely Low
Criticality in X-330 or X-333 Surge Drums	Extremely Low
Criticality in X-330 or X-333 Holding Drums	Extremely Low
UF₆ Cylinders in Storage	
Criticality in X-344A Due to Improper Cylinder Handling	Extremely Low
Chemical Operations	
Criticality at the Uranium Recovery Calciners	Low
PGDP CRITICALITY SCENARIO	
Uranium Solution in Geometrically Unfavorable Configuration	Extremely Low

integrity during movement occurs. All cylinders are allowed to cool 3 to 5 days, depending on cylinder size, to ensure that all of the UF_6 has solidified before they are moved again.

In support of the FSARs, DOE funded the development of a computer code to estimate the consequences of UF_6 releases. This code included models describing the unique chemistry of UF_6 and HF as well as the phenomena associated with dispersion of a gas cloud (e.g., atmospheric dispersion, cloud buoyancy, deposition of reaction products). Based on this code, representative UF_6 releases were analyzed, and the consequences to humans were estimated. These estimates considered conservative atmospheric wind conditions to maximize the consequences. In addition, data were assimilated to support the assessment of effects on human health from exposure to the toxic materials.

The bounding results presented in the SARs assumed conservative meteorological conditions in assessing both on- and off-site effects of a 14-ton liquid UF_6 cylinder rupture in the open atmosphere. Bounding on-site effects were obtained from an assumed windspeed of 15 mph and Class D stability with a temperature of 30°F and 60% relative humidity using a Gaussian dispersion model. Bounding off-site effects were obtained from 2-mph windspeed and stability Class F. The results of these analyses indicate potential lethal conditions for on-site individuals downwind of the release if no protective action is taken. Potential health effects were also calculated for persons located off-site. These health effects included the potential for renal injury due to uranium toxicity, mild health effects, and possible irritation. These off-site consequences were conservatively calculated to extend 5 miles from the release point. These consequence estimates reflect the cumulative exposure to any individual in a fixed location for the duration of the release. Therefore, the estimated consequences due to UF_6 and its reaction products may be characterized as very conservative by assuming (1) very conservative atmospheric conditions, (2) constant wind direction and velocity for the duration of the analysis, (3) that potentially affected individuals will take no protective actions despite the smell and irritation of HF, and (4) that conservative estimates are used for health effects threshold concentrations for the toxic chemicals. This calculation also estimated the committed dose, which was negligible in comparison with the chemical effects of the materials released.

To contrast the calculated results to actual events, comparisons were made with several large, accidental UF_6 releases which have occurred. The most significant event occurred in 1978 at PORTS when a liquid UF_6 -filled 14-ton cylinder was dropped from a straddle carrier. The dropped cylinder ruptured and released more than 20,000 pounds of UF_6 in less than 5 minutes directly to the atmosphere. This event is notable in that no personnel, including the straddle carrier operator, suffered irreversible health effects. Environmental conditions were favorable since the temperature was 32°F, winds were approximately 5 mph, and precipitation was occurring at the time of release. Two other major UF_6 releases of note occurred in France, in which no one was injured, and at Kerr McGee's Sequoyah Uranium Conversion Plant. The accident at Kerr McGee involved the rupture of an overfilled UF_6 cylinder while it was being heated in a confined area. It resulted in the death of a plant worker who was trapped in the plume. There were no irreversible injuries to other workers or to anyone off-site. Note that unlike the Kerr McGee Sequoyah Plant and most fuel cycle facilities that handle UF_6 in cylinders, all cylinder heating at the GDPs is performed inside containment autoclaves in order to prevent the release of UF_6 in the event that an overfilled cylinder is heated. Therefore, an unmitigated release of UF_6 from the rupture of an overfilled cylinder during heating, like the one that occurred at the Kerr McGee Sequoyah Plant, could not occur at the GDPs.

The absence of actual health effects on exposed personnel within the GDP complex is an important piece of data in evaluating and interpreting calculated consequences. The straddle carrier operator did not have his gas mask with him at the time of the event. He identified the event and upon smelling HF, which has a very strong and distinctive odor, immediately left the scene and promptly notified appropriate management of the event. The emergency crews who responded and took action to stop the release

likewise received no irreversible health effects. The accident occurred shortly after a shift change, and personnel leaving the site unknowingly drove through the release plume. These individuals were identified and examined as well and demonstrated no irreversible health effects from the release. In comparison to calculated consequences, the most important variable is clearly the response of the human to the event. The operator was able to quickly vacate the affected area and avoid serious injury. The individuals who unknowingly drove through the plume were exposed for such a brief time period that any effects were minimized. Atmospheric conditions also minimized the release of any toxic materials off-site.

Following the event, an accident investigation team was formed to investigate the event, its causes, and to recommend corrective actions. The team's findings dealt mainly with the maintenance of straddle carriers. Subsequent to this investigation, the plants implemented new procedures which preclude the use of straddle carriers in moving liquid-filled cylinders as a further corrective action. All liquid cylinders are now moved only by overhead cranes and specially designed lifting fixtures.

As previously mentioned, a key difference between the GDPs and most fuel cycle facilities which handle UF_6 in cylinders is that all cylinder heating at the GDPs is performed inside containment autoclaves to prevent a release of UF_6 in the event an overfilled cylinder is heated. These autoclaves effectively preclude a catastrophic UF_6 release because an overfilled cylinder has been heated. As a result, the cylinder drop event is the only credible event for release of the entire contents of a UF_6 cylinder. The potential does exist for the valve to be knocked off a liquid cylinder during movement operations. However, the cylinder orientation is unlikely to be affected such that the boundary breach would be to the vapor space of the cylinder. A release from the vapor space will be limited by the area of the valve hole and the rate at which the liquid can vaporize. Because energy is required to vaporize the liquid, the release rate will be low in comparison to a ruptured cylinder, which would allow for mitigative actions.

One other cylinder scenario involves the reaction of hydrocarbon oil with liquid UF_6 . These materials react exothermically and can rupture a cylinder. This event occurred at the K-25 GDP in 1975, resulting in the release of less than 20 pounds of UF_6 . Corrective action from this event has been to disallow the use of hydrocarbon oil-sealed vacuum pumps without an in-line trap which can hold the entire contents of the pump when cylinders are being purged.

Natural Phenomena

The existing SARs considered the possibility of natural phenomena events with regard to plant safety. Both GDPs were analyzed for the potential safety implications of seismic events, flooding, and extreme winds. For seismic and wind, these analyses were predicated upon a recurrence interval judged to provide acceptable risk. This recurrence interval was determined by considering the remaining life of the GDP facilities and the probability of equaling or exceeding a certain peak ground acceleration (PGA) that would cause structural failure during this remaining life. Based on an exceedance probability of 10% and a remaining facility life of 25 years, the resulting recurrence interval was estimated to be about 250 years. This same recurrence interval was applied to the evaluation of extreme winds.

Seismic. Based on the evaluation return interval described above, both plants were analyzed to determine the PGA. These values were determined to be 0.18 g* for PGDP and 0.05 g for PORTS. The seismic criteria were based upon the nominal spectrum shape of USAEC Regulatory Guide 1.60, *Design Response Spectra for Seismic Design of Nuclear Power Plants*. Based on these values, facilities containing hazardous materials at each site were evaluated for integrity.

*g equals the force resulting from acceleration due to gravity.

Irrespective of the acceleration used, the primary safety concern was associated with process piping thermal expansion joints located in portions of the plants potentially being operated at or above atmospheric pressure. To estimate the potential consequences of a seismic event, assumptions were developed based on the failure of these expansion joints. Test data developed in conjunction with the expansion joint manufacturer were used to estimate process boundary areas where breaches could occur during the evaluation basis event. From these areas, UF_6 source term estimates were developed based on the operating pressure distribution of the cascade.

For PGDP, two cases were considered, 3040 MW (rated power) and 2300 MW. For both cases, releases were assumed to occur only in locations in the cascade that would be operating above atmospheric pressure both at the time of the event and for the time required for operators to take mitigative action to deenergize the compressor motors. Stopping the compressors immediately reduces the cascade pressure to less than atmospheric pressure, effectively terminating the release.

For the 3040-MW case, approximately 64,000 pounds of UF_6 were estimated to be released within 8 minutes to the process buildings and, ultimately, to the atmosphere. For the 2300-MW case, approximately 9,000 pounds of UF_6 were estimated to be released within 8 minutes from the process system.

For PORTS, two cases were considered, 2260 MW (rated power condition prior to HEU suspension) and 1940 MW. Also, assumptions regarding releases similar to those used for PGDP were made. For 2260 MW, an estimated 20,000 pounds of UF_6 would be released. For 1940 MW, the release was estimated to be less than 3,000 pounds of UF_6 .

Calculations were performed to estimate the health consequences of these events to on-site personnel and to the public. In all cases, the postulated 14-ton liquid UF_6 cylinder release bounds the effects of these events. This statement is true even for the large PGDP release because the distributed nature of the release means that the source for dispersion is not from a single location.

The release would not be entirely terminated as assumed in these analyses, because inleakage of air into the cascade would eventually equalize pressures within the process boundary with the atmosphere. At that time, a slow release of UF_6 and HF would be expected to occur for some extended period of time until the remaining UF_6 solidified as it cooled or until mitigative action was taken to reestablish containment. These release rates would be expected to be much less than that estimated above, which would allow for significant dispersion of the toxic materials.

Subsequent to publication of the FSARs, additional modifications were made to each plant to strengthen seismically vulnerable components. Particularly, the expansion joints assumed to fail in the above analysis were replaced with expansion joints designed to withstand the evaluation basis earthquake. The seismic analysis has not been revised to reflect these modifications.

Extreme Winds. Based on the approximately 250-year return interval, an evaluation basis windspeed was determined to be 70 mph. Based on this windspeed, the risk of an accident that resulted in a chemical release or an inadvertent nuclear criticality was judged to be low. Also, any chemical releases are bounded by other assumed events considered in the SAR. In extreme wind conditions, atmospheric dispersion would obviously be enhanced.

Floods. Both plants are sited above the historic maximum flood stages of record—120 feet for PORTS and 28 feet for PGDP. Thus, the probability of flooding was judged to be extremely low. Any flooding at either site as a result of extremely heavy precipitation would be expected to be minor and not to result in a toxic material release or in an inadvertent nuclear criticality.

Other UF₆ Releases

In addition to UF₆ releases from cylinder ruptures and seismic events, many other release scenarios were considered in the SARs. These events can be grouped into categories based on the amount of UF₆ released. There are four general categories of release amounts, 5 to 50 pounds; 100 to 1,000 pounds; 10,000 to 17,500 pounds; and greater than 20,000 pounds. The latter case obviously represents the 14-ton liquid UF₆ cylinder rupture and seismic events which have previously been considered. In all cases, the liquid UF₆ cylinder rupture bounds the consequences.

Based on dispersion and consequence evaluations performed for the SARs, the 10,000- to 17,500-pounds release category warrants discussion because releases of this size pose potential but non-severe off-site consequences. The events which result in a release this size are primarily associated with overpressurization of an onstream cell or with the motor coupling mechanical failure.

The overpressurization events are fundamentally the same event initiated by different events. This event is the closure of a cell block valve on the "B" stream without the associated recycle valve being opened, either as the result of operator error or control system failure. In the event no corrective action is taken, a rapid pressure rise occurs in the stages adjacent to the closed valve in the next upstream cell. Without operator action, the cell compressor motors will ordinarily be deenergized by their protective overload relay. For the SAR analysis, this action was conservatively ignored, and operator action was assumed to require 5 minutes from event initiation. Based on this time to operate and on an assumed breach of the process boundary in the highest pressure stage, a UF₆ release of 10,000 pounds was estimated. These assumptions are conservative because:

- the ACR operator would most likely respond by opening the affected valve or shutting down the compressors because he or she would be alerted by load alarms and valve position indicators, and the central control facility operator would be alerted by audible valve alarms when the B valve changes position;
- the resulting severe compressor motor overloads would likely deblade the compressors, terminating the pressure transient;
- the motor overloads would trip the electrical breakers; and
- the overpressure condition would more than likely result in a distortion of the cell components rather than a catastrophic rupture.

Another event in this release category is failure of a motor-compressor coupling. These couplings have sufficient kinetic energy to penetrate the process system containment boundary. The evaluation of this event estimated a release of 17,500 pounds of UF₆ from a breach of the process boundary equivalent in size to the coupling failure. This event, however, has never been experienced at the GDPs.

Other Chemical Releases

Other chemicals present on-site in quantities to be considered potentially significant hazards in the SAR include HF, F₂, and ClF₃. Each of these materials is highly toxic. Evaluation of these chemicals and potential release scenarios demonstrate that HF is the most significant of these chemicals and potentially poses an off-site hazard from the bounding release scenario. F₂ is stored in limited quantities and is such a strong fluorinating chemical that it will react rapidly with the air upon release and disperse quickly. ClF₃ is also a strong fluorinating chemical and is typically used in sub-atmospheric systems. Like F₂, a ClF₃ release would be of limited quantities and would quickly react with moisture in the air and disperse.

PCBs are also noted as a potential off-site hazard. PCBs are potential carcinogens found in transformers and capacitors. Release of this hazard in conjunction with a fire could potentially affect the public health and safety. Projects are developed to replace all PCB containing capacitors and transformers.

Another chemical present at each plant in quantities to pose potential on- and off-site hazards is chlorine, Cl_2 . Cl_2 was not considered in the SARs because it is not a hazard unique to the GDPs and is common to many other industrial facilities. Cl_2 could potentially pose an off-site hazard to the public. This hazard will be analyzed in the SAR Upgrade Program described in Sect. 2.5.

Criticality

Nuclear criticality safety is achieved by exercising control over both the mass and distribution of all fissile material and the mass, distribution, and use of the nuclear properties of other materials with which fissile materials are associated. Typical controls of fissile materials include mass control, density control, geometry control, and spacing control. For non-fissile materials in contact with or in proximity to fissile material, moderation control, neutron reflection, and neutron absorbers may be employed to prevent inadvertent criticality. Many of these controls are implemented through administrative controls.

As stated previously, PGDP currently can produce a maximum assay of 2 wt % ^{235}U , while PORTS can produce a maximum assay of up to 20 wt % ^{235}U . The bulk of the uranium inventory within the process equipment is maintained in the gaseous phase which cannot be made critical. The liquid and solid phases of UF_6 can become critical if adequately moderated and if assembled in a favorable geometry. The above controls are employed in situations involving the handling of solid or liquid UF_6 to prevent inadvertent criticality events.

Both plants are equipped with instrumentation to detect an inadvertent criticality event; to sound a distinct, audible alarm in warning; and to initiate visual warning lights at entrances of the affected building. This instrumentation is strategically located throughout the plant wherever fissile material is handled.

The formation of solid masses of UF_6 within the cascade is effectively controlled by maintaining temperatures and pressures at levels that prevent UF_6 desublimation. Deposits of UO_2F_2 and other uranium compounds can accumulate within the cascade as a result of inleakage of wet air and other reactions within the cascade. To detect the potential buildup of large solid uranium masses, both plants employ gamma detection instrumentation to periodically survey the cascade equipment for significant deposits. Gamma surveys can indicate the size of the deposit but not with reliable accuracy. Non-destructive assay (NDA) technology was recently introduced at PORTS in conjunction with the HEU suspension effort. This technology allows for a direct estimate of the mass of deposits based on detection of ^{234}U decay. The amount of ^{234}U is proportional to the amount of ^{235}U , such that a mass of ^{235}U can be estimated. NDA has been used to prioritize cells for recovery treatment as part of the suspension effort and clean-up of X-326, the HEU portion of the cascade. PORTS will continue to use the NDA technique to monitor for deposits in the cascade. Because PGDP deals with a maximum of 2% ^{235}U , criticality concerns from cascade deposits are significantly less.

The criticality scenarios addressed in the SARs are much more extensive at PORTS than at PGDP because of the ^{235}U assays, and these scenarios conservatively reflect the pre-HEU suspension maximum assay of greater than 90 wt % ^{235}U . Table 2-4 summarizes the accident scenarios considered. To evaluate the potential consequences from an inadvertent criticality, representative calculations were performed to analyze the potential radiation doses resulting from several postulated nuclear excursion scenarios. These calculations show that the consequences of an inadvertent criticality event are limited to a finite region around the critical array. The effects generally only affect the building in which such

an event might occur, and no adverse off-site effects are predicted. With the operating scheme employed in these plants, namely a local control room in each process building and a central control facility, operators in the central control room can take the necessary actions to shut down equipment if an inadvertent criticality forces evacuation or incapacitation of the building operators.

2.2.3 Operational Safety Requirements

PGDP and PORTS both have OSRs documents which define operational safety limitations. These documents define safety systems, their limits and settings, limitations on conditions of operation, and equipment surveillance requirements.

2.2.4 Maintenance of Safety Basis

Both plants evaluate all plant changes for safety implications according to the operating authorization basis per the requirements of DOE Order 5480.21, "Unreviewed Safety Questions." The authorization basis includes the aspects of the facility design basis and operational requirements relied upon by DOE to authorize operation. The authorization basis is described in the FSARs and other safety analyses, OSRs, and facility-specific commitments made in order to comply with DOE orders or policies. Plant changes are evaluated with respect to this basis, and if there are no adverse impacts to this basis, the changes may be implemented without prior DOE approval. This process is similar to the 10 CFR 50.59 process by which commercial reactors evaluate all changes, tests, and experiments for potential "unreviewed safety questions."

This DOE Order 5480.21 process is relatively new. However, safety evaluations and safety assessments have been commonly employed at both plants for several years. These evaluations provide reasonable assurance that the safety analyses defined in the FSARs remain bounding.

2.3 EFFECTS OF PLANT AGING ON SAFETY

The existing FSARs do not explicitly consider the effects of plant aging on safety. Aging effects could potentially lead to many of the events considered in the safety analyses, particularly the UF_6 and other chemical releases. Aging effects could also result in additional challenges to safety systems and operators. To present a complete picture of the safety of the GDPs, the aspects of aging on plant safety must be examined. Thus, this section addresses the following facets of aging:

- material selection and potential corrosion effects,
- equipment reliability,
- equipment monitoring, and
- cylinder monitoring.

2.3.1 Process Boundary Materials and Corrosion

UF_6 is highly corrosive as are other chemicals (e.g., F_2 , ClF_3) used in other operations at the GDPs. Due to the use of these chemicals, the materials of construction were carefully chosen in the design of the GDPs. As a result, the GDPs have not experienced any corrosion problems with properly chosen materials of construction for those systems in contact with UF_6 . Equipment repairs and the CIP/CUP modifications have provided additional confirmation that corrosion due to UF_6 is not a problem. Equipment removed for repairs and modifications has shown little indication of corrosion.

2.3.2 Reliability Study Program

The GDPs have performed several reliability-related efforts to provide assurance that aging concerns for plant equipment and facilities are identified and appropriate corrective action is taken. This section will describe the more recent reliability effects.

Current reliability efforts are derived from the Reliability Core Study Program which was initiated in the late 1970's. This effort evaluated the general condition of principal production-related equipment, facilities, and systems and associated costs to repair or replace. The availability of replacement parts was also considered, given the age of the plants and potential obsolescence of some equipment. From this information, management prioritized repairs and/or replacements based on available resources. This effort was maintained until the late 1980's. A recent update to these assessments was conducted as part of the USEC transition effort. This assessment addressed the overall physical condition of property and specific conditions which could result in short-term financial burdens.

2.3.2.1 Preventive maintenance program

Both GDPs have Preventive Maintenance (PM) programs which are intended to preserve and extend the useful life of all plant real property. These programs implement positive measures to reduce unscheduled outages and extend the useful life of equipment. Computerized databases provide the capability to schedule PM work, to document its completion, and to assess future requirements. Of particular importance is the inclusion in the PM database of all OSR tests, calibrations, and inspections that are used to verify performance and availability of equipment required for safety.

2.3.2.2 Key process equipment monitoring

As the key active component in the enrichment process, the compressors form the basis for the reliability monitoring programs at the GDPs. Experience has indicated that the compressor seals and motors, and the converters are also worthy of reliability monitoring. Accordingly, the compressors, compressor seals, compressor motors, and converters are routinely monitored for reliability, predicted failures per year, and mean time between failures (MTBF). For the compressors and compressor seals, failure data are collected and input to compressor and seal failure databases which are accessible throughout the GDP operations. These databases are updated, and reports are generated monthly; the capability exists to assure 1-day turnaround on report evaluation.

Statistical analysis of past failure rates indicate that increases in power level and the corresponding number of cascade cells, which may be on- or off-stream as power levels are adjusted, may directly increase failure frequency. Accordingly, the current reliability monitoring analyses consider changes in power levels and actual on-stream time of compressors in establishing the failure history of the compressors. However, the Weibull analysis failure predictions do not consider these changes in severity of service, but, instead, rely solely on compressor age. Nonetheless, the predictions have been reasonably close to actual failure data, as indicated by the FY 1992 data (e.g., 14 actual failures vs 13 predicted failures).

As a result of CIP/CUP, pre-Process Equipment Modification (PEM) target failure rates for the compressors were established at 1.7% failures/stage-year for the 000 compressors and 5.1% failures/stage-year for the 00 compressors. These values were the average failure rates of the period 1960-1973. Failure rates for FY 1992 were 0.63% for 000 compressors and 0.58% for 00 compressors, much lower than the target values. Overall failure rates for the history of operation of the PORTS, PGDP, and Oak Ridge GDPs are 1.05% for the 000 compressors and 1.92% for 00 compressors, also considerably lower than the target values. The predicted MTBF for the compressors is many times the expected lifetime of the plant.

The results of this program are used as input to maintenance and modification activities and to plans for improvements in performance and, therefore, safety.

2.3.2.3 Cylinder Monitoring

Aging of cylinders is not considered a safety concern or issue because of the stringent requirements for inspections, tests, and rejections of cylinders used in the transportation and handling of UF_6 . DOE ORO-651, *Uranium Hexafluoride: A Manual of Good Handling Practices*, invokes the requirements of ANSI N14.1 for new cylinders and provides guidance for the acceptable use of existing cylinders. This guidance includes inspections at various stages (i.e., before receipt, before filling, after maintenance or repair), instructions for rejecting cylinders based on visually observed indications of damage, and periodic tests. All cylinders must be inspected and tested at intervals not to exceed 5 years (except cylinders that were filled before the 5-year expiration date, which need not be tested until the cylinder has been emptied). A UF_6 cylinder shall be removed from service or repaired when it is found to have leaks, excessive corrosion, cracks, bulges, dents, gouges, defective valves, damaged stiffening rings or skirts, or other conditions which render the cylinder unsafe.

For cylinders used in long-term depleted assay storage, the Cylinder Integrity Management program has developed a risk based inspection program to monitor the condition of these cylinders. These cylinders, which are stored out-of-doors, are inspected on specific intervals according to location and previous corrosion. Since the material in these cylinders is solid UF_6 , no significant release of UF_6 will result in the event of a breach in the cylinder wall.

2.4 UPGRADES TO EXISTING SAFETY ANALYSES

As discussed in Sects. 2.2 and 2.2.2, the DOE safety analysis requirements have been revised since the FSARs were issued in 1985. These revisions have added requirements for more formal analysis methods and rigorous documentation. There are no indications that the existing FSARs omitted any significant hazards or failed to provide a conservative estimate of their likelihood, consequences, and risk. However, the bases for the selection and elimination of some of the hazards are not well documented. The risk evaluation in the FSARs is primarily qualitative. Nevertheless, the GDPs were, when FSARs were issued, one of the few nonreactor nuclear facilities within DOE with such safety documentation.

The current SAR upgrade effort is based upon the requirements of DOE Order 5480.23, "Nuclear Safety Analysis Reports," and DOE/OR-901, *Guidance for Preparation of Safety Analysis Reports*, which provide format and content guidance for the development of a SAR based upon a comprehensive, risk-based safety analysis.

2.5 DOE OVERSIGHT AND MANAGEMENT OF THE GDP

DOE and its predecessor organizations have been responsible for the oversight and management of the two operating GDPs since their initial design and construction. Historically, the earliest guidance for oversight of DOE [then the Atomic Energy Commission (AEC)] facilities was provided by the AEC Manual, which was highly prescriptive. In the early 1970s, when the AEC was reorganized into the NRC and the Energy Research and Development Administration (ERDA), the AEC Manual became the ERDA Manual. The ERDA Manual retained the same general format, content, and prescriptive requirements as its predecessor.

When DOE was established in 1977, it codified the existing guidance on nuclear safety requirements for its facilities (contained in the AEC Manual) through a system of Departmental directives known as DOE orders. These orders typically promulgated detailed guidance on facility safety requirements. In

addition, the DOE orders contained DOE policies and requirements associated with protection of assets, environmental compliance, OSHA compliance, good practices, and other elements which would not apply directly to nuclear safety and safeguards and security.

The DOE orders present requirements for all DOE facilities. Thus, GDP compliance requirements are a subset of the requirements specified in DOE orders. For example, DOE Order 5480.11 requires a radiological control program which implements the provisions set forth in the *DOE Radiation Control (RadCon) Manual*. However, the RadCon Manual includes requirements for plutonium and accelerator facilities and for hot particles which are not applicable to the GDPs. Thus, compliance of the GDPs with the DOE orders for nuclear safety does not imply compliance with all elements of the orders. Therefore, the discussion of requirements presented in Chapter 3 focuses on those applicable requirements which are instrumental to supporting nuclear safety and safeguards and security and to providing commensurate protection to the public and environment specifically for the GDPs.

The requirements specified in DOE orders are also supplemented by DOE field organization orders and DOE notices, and more recently, DOE Standards and Guidelines. The field organization orders provide specific directions and define responsibilities within the field organizations for the implementation of a particular order. In general, the DOE notices provide specific directives for compliance with certain requirements and are valid for a specified time only (with the intent that any necessary changes in the requirements will be incorporated into the base order to provide for long-term compliance). DOE Standards and Guidelines provide accepted interpretations of DOE orders and notices.

2.5.1 Department of Energy Oversight Responsibilities

In the past, compliance with the order requirements has been a line management function because DOE was responsible for both management and oversight. As new standards were issued, DOE allocated the resources to achieve compliance based on an assessment of priority for achieving compliance with the new requirements and resource constraints. An integral relationship between DOE's oversight of compliance and management of the facilities was, therefore, essential for the success of the oversight program.

In 1989, the Secretary of Energy changed the DOE organization to improve the safety and management of DOE facilities because the implementation of the oversight function was considered ineffective. Thus, a key element of these changes was the increased emphasis on self-assessment and oversight activities. At the headquarters level, an oversight function was established to report directly to the Secretary of Energy to advise on the adequacy of line management and self-assessment functions. This function had no line authority, but it did have broad responsibilities to monitor and audit all aspects of nuclear safety through the examination of field office and contractor performance. This function was also responsible for identifying special circumstances indicative of deteriorating or poor performance that might warrant further in-depth appraisals. Such appraisals included special safety appraisals conducted with teams including outside expertise representing a bridge to experience in the commercial nuclear industry.

Additionally, separate offices within the DOE elements of Environmental, Safety & Health (ES&H) and S&S were established to conduct independent assessments of DOE and contractor performance. These offices were complemented by similar self-assessment organizations located in the field at DOE and contractor sites.

2.5.1.1 Environmental, safety and health oversight

DOE Order 5482.1B establishes the basic requirements for DOE Headquarters and field office oversight of DOE-contractor ES&H programs and includes requirements for the following types of appraisals.

1. **Management Appraisals:** a documented determination of managerial effectiveness in establishing and implementing ES&H program plans that conform to DOE policy requirements. It is based on an analysis of functional appraisals, internal appraisals, and other information. The appraisal covers all ES&H disciplines and management responsibilities to assure proper program balance.
2. **Technical Safety Appraisals:** a documented multi-discipline appraisal of selected DOE reactors and nuclear facilities conducted by a team representing the DOE Office of Environment Safety, Health and Quality (ESH&Q). The team assesses proper department-wide application of particular safety elements of the ES&H program, nuclear industry lessons learned, and comparability to licensed facility requirements.
3. **Functional Appraisals:** a documented review of an ES&H specialty discipline performed in accordance with written guidance and criteria to verify, by examination and evaluation of objective evidence at the facility or operation, that applicable elements of the program have been developed, documented, and effectively implemented in accordance with specific ES&H requirements and needs.
4. **Internal Appraisals:** an examination and evaluation by the operating level (either federal or contractor) of those portions of an organization's internal ES&H program, program plan implementation, and operations retained under direct control.
5. **Environmental Surveys:** a documented, multi-discipline assessment (with sampling and analysis) of a facility to determine environmental conditions and to identify problem areas of environmental risk requiring corrective action.
6. **Environmental Audits:** a documented assessment of a facility to monitor the progress of necessary corrective actions, to assure compliance with environmental laws and regulations, and to evaluate field organization practices and procedures.

This order requires the quality, frequency, and depth of appraisals to be commensurate with the hazard of the respective operating activities; consistent with both the DOE policy of comparability and equivalence with similar regulatory programs; and consistent with DOE policy of protection of personnel, property, and the environment. Independent of the hazard, this order requires management appraisals to be conducted as least every 3 years and the other appraisals to be conducted at sufficient frequencies to provide meaningful input to the management appraisals.

Although the DOE organization was modified to achieve more effective independent assessment and appraisal, the line organization still remains responsible for ensuring adequate ES&H performance, including reactor and nonreactor nuclear facility safety. Nuclear safety responsibility embraces all systems and activities that can influence the potential for uncontrolled release of fission products or for nuclear criticality. Certainty of nuclear safety involves not only verification that nuclear reactor and nonreactor nuclear facility designs comply with applicable standards but also verification that plant modifications, operations, maintenance, and plant material conditions meet nuclear safety requirements and that human performance facets which could potentially affect nuclear safety are receiving appropriate attention. DOE Order 5480.5, "Safety of Nuclear Facilities," delineates the basic requirements for

ensuring nuclear safety and includes, among other elements, the requirement for a contractor-independent safety and appraisal system.

2.5.1.2 Occurrence Reports and Lessons Learned

DOE Order 5000.3B identifies requirements for occurrence reporting and processing. One major purpose of this reporting system is to provide operational and safety feed-back from a facility Occurrence Report to other DOE nuclear facilities. Sect. 3.2 of this document discusses this aspect of the order and its use in the GDPs. This reporting system also provides a mechanism for DOE oversight of operations information. According to DOE Order 5000.3B, DOE must establish and maintain an unclassified, central DOE operational database containing unclassified Occurrence Reports entered into the database by the Facility Managers and must make the database available to all DOE operating contractors and departmental elements. DOE must review Occurrence Reports to identify circumstances that indicate deteriorating or poor program performance in the areas of nuclear safety, ES&H, and emergency planning to determine if further actions are warranted. Additionally, the DOE Facility Representative and DOE Program Manager, in conjunction with the Facility Manager, should review the database to identify good practices and lessons learned from other facilities that can be used in their facilities. Other DOE oversight responsibilities for Program Managers and Facility Representatives include:

- ensuring that lessons-learned and generic or programmatic implications are identified and elevated to the Headquarters or Operations Office head, as applicable, for appropriate action;
- ensuring that actions are taken to minimize or prevent recurrence;
- reviewing and assessing Reportable Occurrences information from facilities under their cognizance to assess significance, root causes, generic implications, and the need for corrective action; and
- ensuring that Occurrence Reports and operations information from other organizations are disseminated to appropriate DOE and contractor activities, are reviewed for generic implications, and are used to improve operations.

DOE Facility Representatives must also monitor day-to-day operations and performance of facilities and activities under their cognizance.

Before January 1993, DOE 5000.3A, implemented on September 1, 1990, was in force. Since September 1, 1990, the GDPs have reported and analyzed approximately 850 occurrences; related corrective actions have been submitted to DOE for approval.

DOE Order 5000.3A was implemented by Energy Systems through the issuance of a policy document (ES-OP-300) and Energy Systems Standard (ESS.OP.301). PGDP and PORTS sites then issued plant standard practice procedures to implement the order. These procedures are now being combined into a UE procedure format.

Per DOE Order 5000.3A, the GDPs created a site-specific reporting criteria based on the general criteria within the order. These site criteria were approved by DOE-HQ (NE-33) on December 28, 1992, and immediately implemented at both sites.

Additionally, the sites report less significant events through an internal Energy Systems reporting system per Energy Systems Standard ESS.OP.301. To date, the GDPs have reported and analyzed approximately 2,800 events under this system.

Individuals within the site line organizations who are trained and experienced in event root cause analysis investigate DOE Order 5000.3B occurrences. This process begins with the report of an event to the PSS who categorizes the event in the appropriate reporting level per the site reporting criteria.

If the event meets the DOE reporting threshold, a notification report is filed within 24 hours to DOE by way of the EG&G occurrence reporting and processing system (ORPS) database. Telephone notification is also required for those events classified as emergencies (within 15 minutes) or unusual occurrences (within 2 hours of classification).

Events not reportable to DOE are reported through the Energy Systems internal system for investigation.

For DOE reportable events, a follow-up report that further explains the event and updates the information in the notification report is required within ten working days. Within 45 calendar days, a final report, including corrective actions, must be issued to DOE for the approval of both the local site office and then DOE-HQ (NE-33).

Each event is analyzed to determine root, contributing, and direct casual factors for which corrective actions are created and scheduled. This analysis and its conclusions are validated independent of the line organization before the reports are transmitted to DOE.

The corrective actions are entered into the DOE and plant tracking systems. Corrective actions must be independently verified before official closure. Since September 1990, approximately 4000 actions have been directed at event casual factors.

The occurrence reporting system is supported by the Energy Systems Lessons Learned Systems, which captures lessons from various internal and external sources for review.

As a result of this operational information oversight, DOE may identify a Nuclear Safety Issue (NSI) which multiple facilities must address.

2.5.1.3 Safeguards and security oversight

DOE Order 5630.12A establishes the basic requirements for DOE Headquarters oversight of Safeguards and Security programs, while DOE Order 5634.1A establishes the basic requirements for DOE Field Office oversight of DOE-contractor Safeguards and Security programs. DOE Order 5630.12A requires a program of independent inspections, assessments, special studies, and other appropriate activities to determine the effectiveness of DOE's Safeguards and Security policies, programs, and implementation across the department. This inspection and assessment program must be independent of other line management responsibilities for protection program activities; however, it must also remain supplemental and complementary to the line management oversight responsibilities, including their self-assessment activities. DOE Order 5634.1A identifies the requirements for granting facility approvals before permitting Safeguards and Security interests on the premises and identifies the conduct of on-site security or nuclear material surveys of facilities with Safeguards and Security interests. Through these surveys, the adequacy and effectiveness of Safeguards and Security programs and the protection afforded DOE Safeguards and Security interests are evaluated at the facility level.

2.5.2 Special Oversight Activities

Tiger Team assessments were performed at PORTS in October—November 1989, and at PGDP in June—July 1990. The Tiger Team assessments reviewed three primary areas: ES&H, and Management. These assessments are related to the performance-based appraisals performed by Institute of Nuclear

Power Operators (INPO) on nuclear reactors. They are conducted by multidisciplinary teams appraising key functional elements in a coordinated fashion to provide an overall facility or site assessment.

The Safety and Health assessments were based on Technical Safety Appraisal performance objectives derived from DOE orders, Secretary of Energy Notices (SENs), and other policy statements, industry standards, and nuclear industry lessons learned. These Technical Safety Appraisals are operationally focused evaluations intended to appraise how safely a facility or site is operated and the condition of its equipment. The concerns identified by the Safety and Health assessment were obtained by (1) observing routine operations, emergency exercises, and the physical condition of the site and facilities; (2) interviewing management, staff, operators, and craft personnel; and (3) reviewing policy statements, records, procedures, and other relevant documents. The Safety and Health Appraisal findings were classified according to the following:

The Tiger Teams found that plant management had processes in place for improving plant safety performance. There were no Category I findings involving clear and present danger to workers or members of the public, and only four Category II findings "representing significant risk or substantial non-compliance with DOE orders but not involving clear and present danger." Two of the Category II findings were related to electrical safety and x-ray calibration and were corrected immediately. The other Category II findings were related to fire protection. One of these involved failure to comply with the life safety code. As discussed in Sect. 3.18.4, DOE has been asked for an exemption from this requirement because compliance would require replacement of the process buildings. Corrective actions in response to the other finding are mostly complete, with the last scheduled action not due to be completed until September 1993.

Most of the Tiger Team findings involved Category III actions that will be addressed in order of priority. Some of these findings included a lack of full compliance with DOE orders and mandatory standards. On the other hand, the Tiger Teams recognized the commitment of management and the efforts of the staffs to achieve full implementation of the Secretary of Energy's policies, directives, and initiatives. With respect to the Tiger Teams' findings of lack of full compliance with DOE orders, the following should be noted.

- The DOE orders contain more requirements than necessary to protect the health and safety of the public, employees, and environment, as discussed in the introduction and Sect. 2.5.
- The Technical Safety Appraisal criteria and objectives of the assessment, including the determination of compliance with DOE orders, include a broader scope than nuclear safety.

The GDPs have expended significant efforts and money to resolve the findings and issues identified by the Tiger Team assessments.

2.5.3 FY-1992 Oversight Activities

During fiscal year 1992, DOE conducted routine audits and appraisals of PGDP that involved approximately 3.25 staff-years of on-site effort. During the same year, DOE conducted routine audits and appraisals of PORTS, involving approximately 5 staff-years of on-site effort. Additionally, other agencies such as the EPA and state regulatory agencies conducted audits/inspections of PGDP and PORTS. Furthermore, DOE maintains resident site safety representatives at both PGDP and PORTS who also perform routine oversight activities.

2.6 COMPLIANCE WITH DEPARTMENT OF ENERGY ORDERS

The following information describes the means, identified in DOE orders, by which the field organizations and their contractors ensure compliance with the requirements of DOE orders related to public health and safety or Safeguards and Security programs.

2.6.1 Environment, Safety, and Health Compliance

DOE Order 5480.1B establishes the ES&H program for DOE operations. Paragraph 8.d of this order specifies that heads of field operations are responsible for assuring that all operations under their jurisdiction are carried out consistent with sound ES&H practices and in accordance with ES&H orders. To carry out these responsibilities, Paragraph 8.d requires, among other things, that the heads of field operations prepare implementation plans for DOE Order 5480.1B and other DOE Order 5480 series orders that include:

- the designation of ES&H responsibilities and authorities by the field organization and their contractors, and
- a concise description of the approach, resources, and time period planned for implementing orders that require such plans on a sitewide basis, including a description of the execution of ES&H responsibilities and authorities by the field organization and any proposed generic exemptions to parts of such orders.

2.6.2 Environmental Compliance

DOE Order 5400.1 establishes environmental protection program requirements, authorities, and responsibilities for DOE operations for assuring compliance with applicable federal, state, and local environmental protection laws and regulations, executive orders, and internal DOE policies. This order more specifically defines environmental protection requirements that are generally established in DOE Order 5480.1B. The provisions for developing and reviewing specific measures to comply with DOE environmental requirements are specified in Chapter III, Paragraph 2, "Implementation Plan," and Paragraph 3, "Long-Range Environmental Protection Plan."

The Implementation Plan section requires each field organization to prepare a plan for implementing the requirements of DOE Order 5400.1 for each facility or group of facilities. The purpose of the plan is to provide management direction, including assigning responsibilities and authorities, to ensure that all DOE facilities are operated and managed in a manner that will protect, maintain, and where necessary, restore environmental quality, minimize potential threats to the environment and the public health, and to comply with environmental regulations and DOE policies. Specifically, the implementation plan shall do the following.

1. Provide environmental protection goals and objectives for the organization and identify strategies and timetables for attaining them. Organization and staffing, including assignment of responsibilities for environmental activities, policies, facility operating procedures, and budgeting, will be described.
2. Provide an overall framework for the design and implementation of an environmental protection program for each DOE facility.
3. Assign responsibilities for complying with requirements under all federal, state, and local environmental laws and regulations for all DOE facilities.

As an element of ES&H long-range planning, each field organization must develop a long-range environmental protection plan that comprehensively defines specific environmental objectives and the means and schedules for attaining objectives and completing programs and projects at each facility or group of facilities. The plan serves as a mechanism for Headquarters and field organizations to coordinate strategies for addressing environmental needs.

2.6.3 Safeguards and Security Compliance

DOE Order 5630.13A, "Master Safeguards and Security Agreements (MSSA)," and DOE Order 5630.14, "Safeguards and Security Program Planning," identify the provisions for developing and reviewing specific measures to comply with DOE Safeguards and Security requirements. The MSSA establishes a formal agreement requiring the joint approval of Headquarters and field organizations for the levels of protection of graded Safeguards and Security interests from theft, sabotage, and other malevolent acts associated with SNM or vital assets which may adversely affect national security or the health and safety of the public. Such agreements take into account DOE policy applicable to specific sites and programs to achieve acceptable protection levels that minimize inherent risks on a cost-effective basis. The joint approval of the MSSA allows the responsible field organizations to develop plans for protecting Safeguards and Security interests which are acceptable to appropriate Headquarters personnel.

DOE Order 5630.14 establishes a standardized approach to protection program planning by consolidating various protection program plans, previously required reports, and planning-type documents into one planning document—the site Safeguards and Security Plan. The site Safeguards and Security Plan is composed of three volumes: (1) the MSSAs, (2) the Facility Descriptions and Operations Plans, and (3) the Resource Plans. The three volumes of the site Safeguards and Security Plan depict the existing condition of Safeguards and Security sitewide and by facility, establish improvement priorities, and provide for an estimate of resources required for making the necessary improvements. The site Safeguards and Security Plan must be reviewed and updated annually; modifications to the MSSAs are made per the requirements of DOE Order 5630.13.

4. DEPARTMENT OF ENERGY OVERSIGHT

This chapter describes the DOE oversight program as planned for the GDPs during the initial lease period. This program addresses two areas. The first is nuclear safety and safeguards for SNM. In this area the DOE will provide oversight until the NRC has assumed responsibility for regulatory oversight. The second oversight area is the protection of DOE security interests, other than special nuclear materials. DOE oversight in this area will also continue until the NRC specifically assumes regulatory oversight of the GDPs in this area as well.

The oversight required to ensure adequate compliance with applicable environmental laws and Environmental Protection Agency (EPA) regulations (e.g., Title 40 of the Code of Federal Regulations) will be performed by the EPA and is not addressed in this document. Similarly, the oversight required to ensure adequate compliance with applicable Occupational Safety and Health Administration (OSHA) regulation will be performed by the Department of Labor and is also not addressed in this document.

4.1 OVERSIGHT SCOPE

The Implementation Requirements presented in Chapter 3 represent the essential nuclear safety, safeguards and security requirements derived from the Orders presented in Table 4.1. DOE Orders addressing safeguards and security requirements are also included in Table 4.1.

Table 4.1. Department of Energy Orders Impacting Nuclear Safety and Safeguards and Security

Order	Title
DOE Order 1240.2B	"Unclassified Visits and Assignments by Foreign Nationals"
DOE Order 1270.2B	"Safeguards Agreement with the International Atomic Energy Agency"
DOE Order 1324.2A	"Records Disposition"
DOE Order 1324.5A	"Records Management Program"
DOE Order 1360.2B	"Materials Transportation and Traffic Management"
DOE Order 1540.1A	"Materials Transportation and Traffic Management"
DOE Order 1540.2	"Hazardous Material Packaging for Transportation - Administrative Process"
DOE Order 4330.4A	"Maintenance Management Program"
DOE Order 4700.1	"Project Management System"
DOE Order 5000.3B	"Occurrence Reporting" (replaces 5000.3A)
DOE Order 5300.2D	"Telecommunications: Emission Security (TEMPEST)"
DOE Order 5300.3B	"Telecommunications: Communication Security"
DOE Order 5300.4C	"Telecommunications: Protected Distribution Systems"
DOE Order 5400.1	"General Environmental Protection Program"
DOE Order 5400.3	"Hazardous and Mixed Waste Program"
DOE Order 5400.5	"Radiation Protection of the Public and the Environment"
DOE Order N5400.10	"Sealed Radioactive Source Accountability"
DOE Order 5480.1B	"Environment Safety and Health Program for DOE Operations"
DOE Order 5480.3	"Safety Requirements for Packaging and Transportation of Hazardous Materials"
DOE Order 5480.4	"Environmental Protection Safety and Health Protection Standards"

Table 4.1. Department of Energy Orders Impacting Nuclear Safety (continued)

Order	Title
DOE Order 5480.5	"Safety of Nuclear Facilities"
DOE Order 5480.7	"Fire Protection"
DOE Order 5480.8A	"Contractor Occupational Medical Program"
DOE Order 5480.9	"Construction Safety and Health Program"
DOE Order 5480.10	"Contractor Industrial Hygiene Program"
DOE Order 5480.11	"Radiation Protection for Occupational Workers" and change 1 and 2
DOE Order 5480.15	"DOE Laboratory Accreditation Program for Personal Dosimetry"
DOE Order 5480.16	"Firearms Safety"
DOE Order 5480.18A	"Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities"
DOE Order 5480.19	"Conduct of Operations Requirements for DOE Facilities"
DOE Order 5480.20	"Personnel Selection, Qualification, Training and Staffing Requirements at DOE Reactor and Nonreactor Facilities"
DOE Order 5480.21	"Unreviewed Safety Questions"
DOE Order 5480.22	"Technical Safety Requirements"
DOE Order 5480.23	"Nuclear Safety Analysis Reports"
DOE Order 5480.24	"Nuclear Criticality Safety"
DOE Order 5482.1B	"Environment, Safety, & Health Appraisal Program"
DOE Order 5483.1B	"Occupational Safety & Health Program for DOE Contractor/Employees at Government-Owned Contractor-Operated Facilities"
DOE Order 5484.1A	"Environmental Protection Safety and Health Protection Information Reporting Requirements"
DOE Order 5500.1B	"Emergency Management Systems"
DOE Order 5500.2B	"Emergency Categories, Classes, Notification and Reporting"
DOE Order 5500.3A	"Planning and Preparedness for Operational Emergencies"
DOE Order 5500.4	"Public Affairs Policy and Planning Requirements for Emergencies"
DOE Order 5500.10	"Emergency Readiness Assurance Program"
DOE Order 5630.11A	"Safeguards and Security Program"
DOE Order 5630.12A	"Safeguards and Security Inspection and Evaluation Program"
DOE Order 5630.14A	"Safeguards and Security Program Planning"
DOE Order 5630.15	"Safeguards and Security Training Program"
DOE Order 5630.16	"Safeguards and Security Performance Test Program"
DOE Order 5631.1B	"Security Education Briefing and Awareness Program"
DOE Order 5631.2C	"Personnel Security Program"
DOE Order 5631.4A	"Control of Classified Visits"
DOE Order 5632.1B	"Protection Program Operations"
DOE Order 5632.2A	"Physical Protection of Special Nuclear Material and Vital Equipment"
DOE Order 5632.5	"Physical Protection of Classified Matter"
DOE Order 5632.7	"Protective Forces"
DOE Order 5632.7.1	"Firearms Qualification Courses Manual"
DOE Order 5632.8	"Protection program operations - Systems Performance Tests"
DOE Order 5632.9A	"Issuance and Control of Security Badges, Credentials, and Shields"
DOE Order 5633.2A	"Control and Accountability of Nuclear Materials: Responsibilities and Authorities"
DOE Order 5633.3A	"Control and Accountability of Nuclear Materials"
DOE Order 5633.4	"Nuclear Materials Transactions: Documentation and Reporting"
DOE Order 5633.5A	"Nuclear Materials Reporting and Data Submission"
DOE Order 5634.1B	"Facility Approval, Security Surveys, and Nuclear Materials Surveys"
DOE Order 5635.1A	"Control of Classified Documents and Information"
DOE Order 5635.3	"Hand Carrying Classified Matter on Air Carriers:"

Table 4.1. Department of Energy Orders Impacting Nuclear Safety (continued)

Order	Title
DOE Order 5635.4	"Protection of Unclassified Controlled Nuclear Information"
DOE Order 5639.1	"Information Security Program"
DOE Order 5639.3	"Violation of Laws, Losses, and Incidents of Security Concern"
DOE Order 5639.5	"Technical Surveillance Countermeasures Program"
DOE Order 5639.6	"Classified Computer Security Program"
DOE Order 5639.7	"Operations Security Program"
DOE Order 5650.2B	"Identification of Classified Information"
DOE Order 5650.3A	"Identification of Unclassified Controlled Nuclear Information"
DOE Order 5670.3	"Counterintelligence Program"
DOE Order 5700.6C	"Quality Assurance"
DOE Order 5820.2A	"Radioactive Waste Management"
DOE Order 6430.1A	"General Design Criteria"

4.2 PROGRAM FOR OVERSIGHT OF USEC

4.2.1 Regulatory Oversight Manager

The DOE program for nuclear safety and safeguards and security oversight of USEC operation of the GDPs is based on the program, described in Chapter 2, that has been used successfully to oversee past operation of the GDPs. However, the transition in the DOE role from GDP manager to regulator necessitates changes in the structure of the oversight program. The DOE Regulatory Oversight Manager will be the DOE manager for nuclear safety and safeguards and security oversight of the GDPs. In this role, the DOE Regulatory Oversight Manager is responsible for discharging those oversight responsibilities traditionally assigned to both the DOE headquarters and field organizations.

4.2.2 Audits and Appraisals

The DOE Regulatory Oversight Manager is responsible for scheduling and managing DOE appraisals and reviews to verify conformance with the Implementation Requirements in this document. Where appropriate, the DOE Regulatory Oversight Manager shall use qualified ORO personnel and DOE Headquarters personnel, including personnel from the Office of Environment, Safety, and Health (EH), to serve as appraisal team members. Independent reviews and appraisals by DOE Headquarters oversight groups responsible for nuclear safety will also be coordinated by the DOE Regulatory Oversight Manager.

DOE appraisals are currently conducted in accordance with an "Integrated Master Schedule for the GDPs." Consistent with DOE's Uranium Enrichment Self-Assessment Program, DOE appraisals addressing the Implementation Requirements in Chapter 3 shall be continued at the frequencies provided in Table 4.2. Changes in these frequencies may result from changed trends in occurrence reports, from the results of the USEC internal appraisals, when identified nuclear safety issues indicate that additional appraisals are required, or when the DOE determines that additional reviews are required to protect the public health and safety or to provide for the common defense and security. More than one topical area may be addressed in a single appraisal. DOE appraisals addressing the protection of security interests, other than special nuclear material shall be conducted annually. The DOE appraisals may be announced or unannounced. At least one unannounced appraisal, addressing one or more of the basic objectives in Chapter 3, will be performed annually. DOE may, at its discretion, conduct appraisals concurrent with USEC independent internal appraisal activities or observe and review these activities as a part of the appraisals addressing managerial controls and oversight or quality assurance. An independent review or appraisal by select DOE Headquarters oversight groups may be conducted on a quarterly basis addressing one or more of the topical areas. These reviews will be coordinated with the Regulatory Oversight Manager.

In addition to the DOE appraisals, USEC shall ensure that internal appraisals are conducted (i.e., self-assessments), which shall address all of the Implementation Requirements in Chapter 3 at least annually, with the Implementation Requirements for half of the basic objectives in Chapter 3 addressed during the first half of each fiscal year. At the beginning of each fiscal year, USEC shall submit to the Regulatory Oversight Manager its schedule for internal appraisals. USEC shall submit internal appraisal reports and planned corrective actions, including completion schedules, to DOE within 30 days of the completion of the internal appraisal field work.

4.2.3 Operational Oversight

DOE site safety representatives shall be assigned to each GDP and shall be provided office space by USEC. These site representatives will report to the DOE Regulatory Oversight Manager and continue oversight of day-to-day operations by maintaining a site presence for surveillance and inspection of operational activities to ensure that plant continues to meet the Implementation Requirements set forth in

Chapter 3. In addition, DOE shall conduct investigations of all events relating to nuclear safety or safeguards designated as requiring an investigation in DOE Order 5484.1A, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements."

Table 4.2. DOE appraisal frequency

Chapter 3 Topical area	Appraisal frequency
3.1 Organization Plan	Every 2 Years
3.2 Managerial Controls and Oversight	Every 1 Year
3.3 Operations	Every 1 Years
3.4 Engineering Reviews	Every 1 Years
3.5 Training and Qualification	Every 2 Years
3.6 Quality Assurance	Every 1 Year
3.7 Maintenance	Every 2 Years
3.8 Radiation Protection Programs, Systems, Designs and Permits	Every 1 Year
3.9 Nuclear Criticality Safety	Every 1 Year
3.10 Fire Protection	Every 1 Year
3.11 Environmental Protection	Every 3 Years
3.12 Nuclear Material Safeguards	Every 1 Years
3.13 Emergency Preparedness	Every 1 Year
3.14 Packaging and Transporting Nuclear Materials	Every 2 years
3.15 Sampling and Analysis	Every 2 Years
3.16 Waste Management Program	Every 2 Years
3.17 Accident Analysis	Every 1 Year
3.18 Security	PORTS-1 Year PGDP-1.5 Year

5. CONCLUSIONS

The original GDP designs, which were based on technology and requirements existing when the GDPs were constructed, incorporated an adequate degree of safety as shown through 40 years of safe operation. The overall safety of the original designs has been improved through upgrade projects and through the application of lessons learned over the GDPs' operational lifetime. The conclusion the plants' original designs incorporated an adequate degree of safety is reinforced by the 1985 FSARs and subsequent upgrade analyses.

The plants are operating safely under the auspices of the DOE nuclear safety and safeguards and security framework. This conclusion is supported by the results of both the DOE audit and appraisal program and special assessments.

The plants can continue to be operated safely in accordance with the requirements in Chapter 3. USEC's commitments to continue to meet the Implementation Requirements set forth in Chapter 3 coupled with DOE's oversight plan in Chapter 4 provide adequate assurance that the plants will continue to be operated safely during the interim period.

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6. BIBLIOGRAPHY

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- 10 CFR 19, "Notices: Instructions and Reports to Workers: Inspections and Investigations"
- 10 CFR 20, "Standards for Protection Against Radiation"
- 10 CFR 21, "Reporting of Defects and Noncompliances"
- 10 CFR 26, "Fitness for Duty"
- 10 CFR 30, "Rules of General Applicability to Domestic Licensing of Byproduct Material"
- 10 CFR 33, "Specific Domestic Licenses of Broad Scope for Byproduct Material"
- 10 CFR 34, "Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations"
- 10 CFR 40, "Domestic Licensing of Source Material"
- 10 CFR 50, "Domestic Licensing of Production and Utilization Facilities"
- 10 CFR 70, "Domestic Licensing of Special Nuclear Material"
- 10 CFR 71, "Packaging and Transportation of Radioactive Material"
- 10 CFR 73, "Physical Protection of Plants and Materials"
- 10 CFR 74, "Material Control and Accountability of Special Nuclear Material"
- 10 CFR 75, "Safeguards on Nuclear Material—Implementation of the US/IAEE Agreement"
- 29 CFR 1903, "Inspections, Citations, and Proposed Penalties"
- 29 CFR 1904, "Recording and Reporting Occupational Injuries and Illnesses"
- 29 CFR 1910, "Occupational Health and Safety"
- 29 CFR 1926, "Construction Safety"
- 40 CFR 61, "Subpart H National Emission Standards for Hazardous Air Pollutants Radionuclide Emissions from DOE Facilities"
- 49 CFR 173, "Subpart I Hazardous Materials Regulations"
- 49 CFR 392, "Driver of Motor Vehicles"
- ANSI/IEEE Standard 498-1985, "IEEE Standards Requirements for the Calibration and Control of Measuring and Test Equipment Used in Nuclear Facilities"
- ANSI 8.1, "Nuclear Criticality Safety in Operation with Fissionable Materials Outside Reactors"

6. BIBLIOGRAPHY (Continued)

- ANSI 8.19, "Administrative Practices for Nuclear Criticality Safety"
- ANSI 8.3, "Criticality Accident Alarm System"
- ANSI/ANS 3.1, "Selection Qualification and Training for Nuclear Power Plants"
- ANSI/ASAC MI-1987, "American National Standard for Calibration Systems"
- ANSI/ASME NQA-1, "Element 12 Control of Measurement and Test Equipment"
- ANSI N14.1, "Uranium Hexafluoride—Packaging for Transport"
- ANSI N323, "Radiation Protection Instrumentation Test and Calibration"
- ANSI/NFPA 30, "Flammable & Combustible Liquids Code"
- ANSI/NFPA 231, "General Storage"
- ANSI/NFPA 395, "Flammable Liquids"
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- DOE 1540.1A, "Materials Transportation and Traffic Management"
- DOE 1540.2, "Hazardous Material Packaging for Transportation - Administrative Process"
- DOE 4330.4A, "Maintenance of DOE Nonnuclear Facilities"
- DOE 4700.1, "Project Management System"
- DOE 5000.3B, "Occurrence Reporting" (replaces 5000.3A)
- DOE 5300.2D, "Telecommunications: Emission Security (TEMPEST)"
- DOE 5300.3B, "Telecommunications: Communication Security"
- DOE 5300.4C, "Telecommunications: Protected Distribution Systems"

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- DOE N5400.10, "Sealed Radioactive Source Accountability"
- DOE 5480.1B, "Environment Safety and Health Program for DOE Operations"
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- DOE 5500.1B, "Emergency Management Systems"
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- DOE 5500.3A, "Planning and Preparedness for Operational Emergencies"
- DOE 5500.4, "Public Affairs Policy and Planning Requirements for Emergencies"
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DOE 5635.3, "Hand Carrying Classified Matter on Air Carriers"

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DOE 5639.7, "Operations Security Program"

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USDOE Performance Objectives and Criteria for Conducting DOE Environmental Audits and Environmental Tiger Team Assessments (Undated)

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Attachment

**TYPICAL SAFETY ANALYSES ACTIVITIES SINCE COMPLETION
OF THE 1985 FSAR**

PORTSMOUTH:

FSAR Revisions

Revision 1: November 25, 1986: Changes to incorporate the addition of the freezer/sublimers.

Revision 2: November 25, 1986: Changes to incorporate the addition of the UF₆ containment projects at the feed and withdrawal areas and various administrative changes.

Revision 3: January 20, 1988; Various administrative changes.

Revision 4: June 26, 1989: Various administrative changes.

Revision 5: March 2, 1990: Changes to incorporate the X-705 waste water treatment system.

Revision 6: May 21, 1990: Changes to incorporate modifications to the X-705 truck alley sump pit, the X-705 pH adjustment system, and the X-705 small cylinder rise pit.

Revision 7: November 7, 1990: Various administrative changes.

Revision 8: April 26, 1991: Various administrative and editorial changes.

Revision 9: July 27, 1992: Changes to incorporate the modifications to the limiting safety system settings and safety limits for the X-705 microfiltration permeate bag filter pressure differential shutdown system.

Safety Analysis Activities Since 1985

- 1. Since 1985, approximately 250 safety assessments have been approved for plant modifications and testing. This number does not include assessments that are still in progress or awaiting approval.**
- 2. On August 24, 1992, PORTS instituted the Unreviewed Safety Question Program. Since that time, 35 USQDs have been approved, and approximately 75 others are in progress or awaiting approval.**
- 3. A detailed Safety System Analysis was performed for the Highly Enriched Uranium Suspension Project. This analysis included all modifications required to ensure the safety of the shutdown cells, piping modifications, and extended range product withdrawal modifications. It also included the necessary OSR changes. DOE approved this analysis.**
- 4. A detailed PRA was performed for the liquid UF₆ handling facilities at PORTS. The PRA examined all aspects of the operations, design, and construction of the facilities and quantified the frequency of events.**

Attachment (Continued)

TYPICAL SAFETY ANALYSES ACTIVITIES SINCE COMPLETION
OF THE 1985 FSAR

OSR (GAT/GDP 1074 PARTS A THROUGH L) CHANGES SINCE 1985

PART A	08/86	General changes to reflect FSAR revisions.
	03/87	Added section on deviation from an OSR.
PART B	08/86	General changes to reflect FSAR revisions.
	10/92	HEU suspension modifications.
PART C	05/87	General changes to reflect FSAR revisions.
PART D	02/83	Dropped several safety systems.
	07/86	Changed high weight setting to 8200 pounds plus other general changes.
	09/87	Changed to show a valving modification for separating freon from UF ₆ .
PART E	02/87	General changes to reflect FSAR revisions.
PART F	10/86	General changes to reflect FSAR revisions.
	03/87	Changed section concerning deviation from OSRs.
	04/92	Changed cylinder low pressure safety system basis.
PART G		No changes.
PART H	11/89	Major changes to reflect new waste treatment systems.
	05/92	Changed bag filter pressure differential safety limit and limiting safety system setting.
PART I	09/87	General changes to reflect FSAR revisions.
PART J		No changes.
PART K	08/86	General changes to reflect FSAR revisions.
	10/92	Changed to reflect raising assay limit of 10-ton cylinders to 5%.
PART L	03/87	Changed to reflect concern over shaft seal lubrication pressure.

All PARTS are being revised during 1993.

Attachment (Continued)

**TYPICAL SAFETY ANALYSES ACTIVITIES SINCE COMPLETION
OF THE 1985 FSAR**

Operational Safety Requirements

X-330 and X-333 Uranium Enrichment Cascades—Part A

X-326 Uranium Enrichment and Purge Cascades—Part B

Freon Degraders—Part C

Freezer/Sublimers—Part D

X-330 and X-333 Cold Recovery Systems—Part E

UF₆ Cylinder Heating Autoclaves—Part F

X-326 High Assay Sampling Facility—Part G

X-706 Decontamination Building—Part H

X-345 SNM Storage Facility—Part I

HF Tank Farm—Part J

ERP, LAW, and TAILS Withdrawal Facilities—Part K

X-345 High Assay Sampling Facility—Part L

PADUCAH:

FSAR Revisions

Revision 1: Issued approved September 6, 1985; C-340 Metal Casting Facility.

Revision 2: Issued approved March 31, 1986; Miscellaneous Changes.

Revision 3 (originally submitted as Revision 5): Issued approved May 15, 1989; PICS Freezer/Sublimers Relocates.

Revision 4: Approved April 19, 1989; Normetex Pump Additions.

Attachment (Continued)

TYPICAL SAFETY ANALYSES ACTIVITIES SINCE COMPLETION
OF THE 1985 FSAR

Unapproved Submittals—Supporting Line Item Construction Projects (All Completed)

Revision 3: Chemical Operations.

Revision 6: Intermediate Gas Removal System and C-360 Toll Transfer and Sampling Facility Modifications.

Revision 7: Seismic Upgrade.

Safety Analysis Activities Since March 1985

1. Approximately 330 Safety Assessments (or PSRs) have been completed for plant modifications initiated by ESOs. Another 75 projects initiated through ESRs have also been assessed.
2. On September 27, 1991, a USQD program was instituted at PGDP. Since that time, 47 safety evaluations (or PSEs) of proposed changes, tests, or experiments have been completed. By September 1993, the USQD process will be integrated into PSRs in the form of a PSE to determine the applicability of the DOE order. Since September 1990, 92 safety evaluations have been made through the PSR process.
3. KY-792, *System Safety Analysis (SSA) for the Higher Assay Upgrading Project (HAUP)*, has been submitted to DOE for final approval following comment and resolution activities. This SSA will provide the authorization basis (including interim OSR) for PGDP operation at an assay of 5 wt %.

Operational Safety Requirements - Revisions

KY/D-3971, *Operational Safety Requirements for UF₆ Enrichment Cascade*

Issued: March 29, 1985.

Revision 1: April 28, 1986.

Revision 2: February 25, 1987.

Revision 3: November 1, 1991.

Revision 4: June 16, 1992.

Attachment (Continued)

TYPICAL SAFETY ANALYSES ACTIVITIES SINCE COMPLETION
OF THE 1985 FSAR

KY/D-3972, Operational Safety Requirements for C-360 Toll Transfer and Sampling Facilities

Issued: March 29, 1985.
Revision 1: March 27, 1987.
Revision 2: December 10, 1990.
Revision 3: February 4, 1993.

KY/D-3973, Operational Safety Requirements for Chemical Operations

Issued: March 29, 1985.
Revision 1: February 27, 1987.
Revision 2: September 20, 1988.
Revision 3: April 6, 1992.

KY/D-3974, Operational Safety Requirements for Product and Tails Withdrawal Facilities

Issued: March 29, 1985.
Revision 1: June 30, 1986.
Revision 2: April 19, 1989.
Revision 3: June 9, 1992.

KY/D-4151, Operational Safety Requirements for UF₆ Feed Facilities

Issued: February 26, 1986.
Revision 1: June 23, 1989.
Revision 2: February 4, 1993.

Submitted but not Approved

KY/L-1493, Operational Safety Requirements for the PGDP C-710 Facility, submitted July 15, 1988.

KY/H-188, Operational Safety Requirements for Criticality Accident Alarm System, submitted July 1, 1992.

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APPENDIX B TO EXHIBIT D

ENFORCEMENT PROCESS

APPENDIX B - ENFORCEMENT PROCESS

GENERAL APPROACH TO ENFORCEMENT PROCESS

The Atomic Energy Act of 1954, as amended, requires DOE to protect the public health and safety, as well as the safety of workers at DOE-owned facilities, and to provide for the common defense and security in conducting its nuclear activities, and grants DOE broad authority to achieve these goals. Consistent with this responsibility, DOE will take prompt and vigorous enforcement actions when dealing with the USEC when it does not comply with applicable DOE requirements contained in Chapter 3 of the Plan. This Appendix establishes the procedures for (a) investigating the nature and extent of alleged violations of the Nuclear Safety and Safeguards and Security Requirements set forth in Chapter 3 of Appendix A, entitled "Safety Basis and Framework for DOE Oversight of the Gaseous Diffusion Plants;" (b) determining whether a Violation has occurred; and (c) if a violation has occurred, imposing an appropriate remedy.

1. ENFORCEMENT ACTIONS

A. Shutdown Authority

1. Clear and Present Danger

Whenever a DOE Appraisal Team Member, site safety representative, or the DOE Regulatory Oversight Manager in carrying out his or her responsibilities, determines that the nuclear safety or safeguards and security conditions at any Leased Facility constitute a Clear And Present Danger, he or she shall immediately notify the cognizant operations supervisor. If the supervisor fails to take what the appraisal team member/site safety representative believes is appropriate and timely action to curtail or suspend the activity or operation, or to mitigate the identified Clear And Present Danger by other means, the appraisal team member/site safety representative shall notify the plant shift superintendent. The appraisal team member/site safety representative shall explain the situation and request that the plant shift superintendent take appropriate action to curtail or suspend the activity or operation, or to mitigate the danger by other means. The USEC agrees that the plant shift superintendent shall take timely action to curtail or suspend the operation, or to mitigate the danger by other means, when so requested by the DOE appraisal team member or site safety representative when said DOE representative perceives a Clear And Present Danger to exist. The plant shift superintendent shall inform the

DOE appraisal team member/site safety representative of the actions taken to curtail or suspend the activity or operation, or to mitigate the identified Clear And Present Danger by other means. If the appraisal team member/site safety representative believes that these actions are not sufficient, he or she shall notify the Site Manager who shall notify the DOE Regulatory Oversight Manager, informing him or her of the details of the situation. If the DOE Regulatory Oversight Manager agrees that the action taken is not sufficient, he or she shall contact the plant superintendent and direct that he or she take specific actions to curtail or suspend the activity or operation, or to mitigate the danger by other means. When so directed by the DOE Regulatory Oversight Manager, the USEC agrees to take, or cause the operating contractor to take, these specific actions. DOE and USEC agree that no written notice is required for DOE to exercise its shutdown authority pursuant to this paragraph.

2. Unreviewed Safety Questions

The DOE Regulatory Oversight Manager may also order an activity or operation curtailed or suspended, in the absence of a Clear And Present Danger, when he or she concludes that continued operation would involve an Unreviewed Safety Question, as defined in DOE Order 5480.21, "Unreviewed Safety Questions."

B. Notice of Violation

In the event of an alleged Violation, the DOE Regulatory Oversight Manager shall provide USEC with a written Notice Of Violation. The written Notice Of Violation shall concisely describe the alleged failure of the USEC or its contractor(s) to meet one or more of the Nuclear Safety and Safeguards and Security Requirements in effect at the time of the alleged Violation. In particular, the Notice Of Violation shall specify the date or dates, facts, and the nature of the alleged acts or omissions constituting the Violation, and shall identify specifically the particular provision or provisions of the Nuclear Safety and Safeguards and Security Requirements involved in the alleged Violation. Within 30 days of the date of the notice or other time period specified in the notice, USEC will submit a written reply. USEC may admit or deny the alleged Violation and state the reasons for the Violation, if admitted. In the event the alleged Violation is admitted, this reply shall also contain an explanation or statement including: (1) corrective steps that have been taken by USEC or others and the results that

have been achieved; (2) corrective steps that will be taken; (3) the date when full conformance with the Nuclear Safety and Safeguards and Security Requirements in the identified area will be achieved.

C. Civil Penalties

1. Prior to imposing any Civil Penalty on the USEC, the DOE Regulatory Oversight Manager shall provide to USEC a written Notice Of Violation, as described above, and a Notice Of Proposed Imposition of Civil Penalty and shall state that the Civil Penalty may be paid in the amount specified therein or the proposed imposition of the Civil Penalty may be protested in its entirety or in part, by a written answer either denying the Violation or showing extenuating circumstances. The USEC agrees to either pay the Civil Penalty in the amount proposed or answer the Notice Of Proposed Imposition of Civil Penalty within 30 days of the date of a Notice Of Proposed Imposition of Civil Penalty or other time specified in that notice. The answer to the Notice Of Proposed Imposition of Civil Penalty shall state any facts, explanations, and arguments, denying the alleged Violation, or demonstrating any extenuating circumstances, error in the Notice Of Violation or other reason why the Proposed Civil Penalty should not be imposed and may request remission or mitigation of the proposed Civil Penalty. If the USEC files an answer to the Notice Of Proposed Imposition of Civil Penalty, the DOE Regulatory Oversight Manager, upon consideration of the answer, will issue a revised Notice Of Proposed Imposition of Civil Penalty imposing, mitigating, or remitting the Civil Penalty. The USEC agrees to either pay the Civil Penalty in the amount specified or appeal the decision to the DOE ORO Manager within 30 days of the issuance of that revised Notice Of Proposed Imposition of Civil Penalty. Any appeal shall be presented in writing, with an opportunity for USEC to be heard, if so requested.
2. The amount of the Civil Penalty imposed shall be based upon the severity of the Violation, including the potential for the Violation to affect the public health and safety or the common defense and security and whether it was a repeat Violation, the actions taken to respond to the Violation, and any extenuating circumstances. Violations shall be assigned by the DOE Regulatory Oversight Manager, to one of three severity levels. Severity

Level I Violations are determined: (1) to create or to have significant potential for creating a Clear And Present Danger or (2) to significantly increase the hazard to plant workers or the risk of an accident with significant off-site consequences; or (3) to be indicative of a serious breakdown in the facility Nuclear Safety and Safeguards and Security Requirements program which results in a significant potential that plant structures, systems, or components important to nuclear safety, safeguards or security would fail to perform their intended function. Severity Level II Violations are serious or recurring Violations determined: (1) to have potential to contribute to the creation of a Clear And Present Danger or (2) to moderately increase the hazard to plant workers or the risk of an accident with off-site consequences; or (3) to be indicative of degradation of a facility nuclear safety or safeguards and security program. Severity Level III Violations are those determined to involve significant shortcomings in the measures employed to meet individual Nuclear Safety and Safeguards and Security Requirements, but no overall degradation of the effectiveness of the nuclear safety or safeguards and security programs. Penalties for Severity Level I Violations may range from \$10,000 to \$50,000 per occurrence. Civil Penalties for Severity Level II Violations may range from \$5,000 to \$20,000 per occurrence. Civil Penalties are generally not imposed for Severity Level III Violations.

3. Civil Penalties imposed on the USEC pursuant to this Agreement shall not be subject to Sections 5.1 and 5.2 of ARTICLE V, entitled "Allocation of Liabilities," of the Lease.

D. Failure to Take Agreed upon Actions

In the event of the failure of USEC to take the actions in accordance with this Agreement, the DOE ORO Manager shall take such actions as he or she deems appropriate, consistent with the terms of this Agreement and the Lease, including, but not limited to, a recommendation to the Secretary of Energy that he or she take steps to initiate an orderly termination of the Lease, to provide adequate assurance that USEC operation of the Leased Premises does not pose undue risk to the public health and safety or result in failure to provide for the common defense and security. Notification of the actions taken under such circumstances will be provided

to USEC in the form of directives issued by the DOE ORO
Manager.

3. OPERATIONAL REQUIREMENTS

This chapter describes the envelope of plant operating requirements that are being followed and are considered necessary to protect public health and safety and to assure adequate safeguards and security of the GDP facilities. These requirements and the implementation of these requirements will result in continued safe operation of the GDPs.

A number of sources, listed in the Bibliography (Chapter 6), have been reviewed to substantiate the basic content of these safety requirements. This review has confirmed that the current GDP safety requirements encompass the spectrum of essential nuclear safety and safeguards and security requirements contained in the referenced documents.

The basic objective of each of the topical areas is provided, followed by a set of Implementation Requirements that define what must be done to address the basic objective. These are followed by a description of how the GDPs are meeting the Implementation Requirements. Finally, the status of the conformance of GDP programs and practices with the Implementation Requirements is summarized for each topical area.

A reference is provided for each of the Implementation Requirements. The citation of a DOE Order, American National Standards Institute (ANSI) standard, or National Fire Protection Association (NFPA) standards does not imply that all requirements listed in the order or standard are a mandatory part of the safety basis for the GDPs. The DOE Order, ANSI standard, or NFPA standard is listed only to indicate the source of the implementation requirement.

The programs, procedures, and practices used by the GDPs to satisfy the Implementation Requirements at the time this report was prepared are described in the "How the Requirements Are Met" sections. The plant or Uranium Enrichment governing documents supporting the implementation of the requirement are shown at the end of each paragraph of the description of how the requirement is met. All implementation measures identified in such documents may not apply to the particular requirement in question or may not be fully implemented in the detail specified by the referenced document. The implementation of the requirements can, however, be audited against the descriptions provided in the "How The Requirements Are Met" sections.

This document often refers to safety systems and authorization basis. Safety systems or components are defined as "Systems, components, and structures, including portions of process systems, whose failure could adversely affect the safety and health of the public. These are necessary to prevent accidents or mitigate their consequences, or to monitor releases that could result in potential off-site exposures." Safety systems for the GDPs are identified in the respective OSR documents for each plant. The authorization basis is described in documents such as the facility Safety Analysis Report and other safety analyses; Hazard Classification Documents, the OSRs, DOE-issued safety evaluation reports, and facility-specific commitments made in order to comply with DOE Orders or policies.

3.1 ORGANIZATION PLAN

3.1.1 Basic Objective

Operation of the GDPs shall be organized in a manner to ensure that responsibility and authority for safe operations are clearly defined, and that critical safety functions such as Nuclear Criticality Safety (NCS), radiation protection, quality assurance, and preparation of USQDs are independent of production.

3.1.2 Implementation Requirements

1. Each plant shall have procedures or other appropriate documentation which clearly defines authority, responsibility, and accountability for safe operations. The documentation shall contain the following elements.
 - a. Authority for safe operation shall be clearly defined for each position of responsibility (DOE Order 5480.5, DOE Order 5480.1B).
 - b. Responsibility for safe operations shall be clearly delineated in each position description and in each "roles and responsibility" document (DOE Order 5480.1B, DOE Order 5480.20).
2. Quality assurance, radiation protection, NCS, and USQD preparation functions shall be independent of production and personnel assigned in these areas should be authorized to halt unsafe activities (DOE Order 5700.6C, DOE Order 5630.11A, DOE Order 5480.19).

3.1.3 How Requirements Are Met

1. The plants are organized in an hierarchical fashion. Each plant maintains an organization chart and written position descriptions. The plant manager is the senior Uranium Enrichment official with on-site responsibility for safe operations. There is a direct chain of command from the Plant Manager to the shift operating staff. On back-shifts and weekends, the plant shift superintendent represents the plant manager. Managers of all the line and support functions needed for the safe and efficient operation of the GDPs report to the plant manager.
 - Responsibility for safe operation and compliance with regulations resides with the plant management. The plant manager assigns responsibility for safe aspects of operations to all levels of management and supervision within the plant. These responsibilities are outlined in plant procedures describing specific operations.
 - Position descriptions and roles and responsibilities documents are prepared for managerial and supervisory positions. Periodic performance reviews are conducted to re-enforce desired supervisory behavior.
 - Each division manager has the authority and responsibility to enforce safe operations within his or her division.
 - Each department manager has the authority and responsibility to ensure safe operation within his or her department.
 - Each supervisor is charged with the safety of the personnel and the facility that he or she supervises.
 - Each worker has the authority to stop work if he or she recognizes an imminent danger that the worker cannot immediately address or correct.
2. Quality assurance, radiation protection, NCS, and USQD preparation are independent from production activities at both plants. Quality Assurance is the responsibility of the Management Systems and Compliance Divisions, which are also separate from production at both plants. Department and division managers for these functions have direct access to the plant manager. Department managers and personnel responsible for radiation protection, NCS, USQD preparation and Quality Assurance have the authority to halt activities they consider unsafe. Stop work actions

initiated for safety reasons can only be removed with the concurrence of the function manager responsible for the stop work order.

3.1.4 Status of Conformance

The requirements set forth in Section 3.1.2 are met as described in Section 3.1.3 with the following general exceptions:

- Some of the plant procedures and other documentation describing the organizational structure are not consistent with the organization as it currently exists and need to be updated.

3.2 MANAGERIAL CONTROLS AND OVERSIGHT

3.2.1 Basic Objective

Management Controls and Oversight (MC&O) shall ensure that activities directly relevant to nuclear safety and safeguards and security are conducted in an appropriately controlled manner that ensures protection of employee and public health and safety and protection of the national security interests.

3.2.2 Implementation Requirements

1. Procedures and documents important to nuclear safety and safeguards and security shall be developed, revised, reviewed, approved, distributed, and used in accordance with identified, written requirements and authorizations (DOE Order 5700.6C and DOE Order 5630.11A).
2. An internal and independent safety review process shall be established and maintained (DOE Order 5480.5).
3. Occurrences shall be reported and investigations conducted on events that could affect the health and safety of the public, or endanger the health and safety of workers (DOE Order 5000.3B and DOE Order 5480.21).
4. A commitment tracking system shall be maintained to monitor the status of formal commitments to improve nuclear safety and safeguards.
5. Administrative controls shall provide standard methods and requirements for creating, collecting, maintaining, and disposing of records related to nuclear safety and safeguards and security (DOE Order 1324.2A; DOE Order 1324.5A).

3.2.3 How Requirements Are Met

MC&O at the UE facilities is assured through implementation of applicable parts of the Uranium Enrichment Quality Program Plan (UEQPP). The UEQPP assigns accountability for quality attainment and assessment of performance of the management systems to the line organizations.

1. Management has established a procedure that defines the expectations for procedure use. Procedure use is consistent with a graded approach based on the significance of the activity (both plants, UE-SPP-PS-100, Sects. 1.0, 6.2, 6.3, and 6.4). Procedures exist at the UE and plant levels that define how safety and safeguards and security procedures are developed, revised, reviewed and approved, and distributed (UE-2-PS-PS1001; P-GP-1, Rev. 2; SPP-PS-001).

2. The Health and Safety Review Committee (HSRC) at PGDP and the Independent Safety Review Committee (ISRC) at PORTS, provide independent health and safety oversight to safety analysis documentation, (FSARs, OSRs) and Unreviewed Safety Questions (USQs).
3. Unusual Occurrence Reporting and investigation of abnormal events include identification and categorization of events as well as analysis of root cause, effectiveness of response to the occurrence, and impact or effect of the occurrence on nuclear safety, safeguards and security. Corrective actions are entered into the commitment tracking system, and their completion is independently validated, appropriately verified, and documented (both plants, UE2-MC-CI-1001, Chapters 2, 6.3, and 7). See also Section 2.5.1.2 for more detail concerning current practice on Unusual Occurrence Reporting.
4. Commitment tracking is provided through a dedicated database for tracking, trending, and managerial review. All corrective actions and commitments from the safety review committees actions, internal and external assessments, Lessons Learned, and unusual occurrences are independently validated, tracked, trended, appropriately verified, and documented (both plants, UE2-MC-CI-1001, Chapters 2, 6.3, and 7).
5. A records management process is established by documented administrative controls that provide standard methods and requirements for the creation, collection, maintenance, and disposition of records related to nuclear safety, safeguards and security. Designated retention times and storage requirements are provided (both plants, UEQPP, Criterion 4).

3.2.4 Status of Conformance

The requirements set forth in Section 3.2.2 are met as described in Section 3.2.3.

3.3 OPERATIONS

3.3.1 Basic Objective

Management shall ensure that plant operations are performed within the controls developed through the use of hazard analysis and safety reviews.

3.3.2 Implementation Requirements

1. Operating bounds for safety systems and components as established by OSRs shall be observed (DOE Order 5480.5, DOE Order 5480.22).
2. Safety system surveillance requirements, as established in the OSRs, shall be conducted as specified. Additional tests to verify proper operation of systems and integrity of confinement structures shall be conducted after significant maintenance as specified in post-maintenance testing procedures. Completed OSR surveillance tests and safety system check sheets shall be independently reviewed. (DOE Order 4330.4A, DOE Order 5480.19, and DOE Order 5700.6C).
3. Procedures shall be prepared to facilitate initial and periodic tests of safety-related equipment to ensure it operates and meets design objectives (DOE Order 5480.5, DOE Order 5480.21, and DOE Order 5700.6C).
4. Management shall assess plant operations and personnel performance through a program of monitoring and plant tours (DOE Order 5480.5, DOE Order 5480.21).

5. Turnovers conducted for selected shift stations shall ensure the effective and accurate transfer of information between shift personnel (DOE Order 5480.19).
6. Management shall ensure that proposed changes which involve an Unreviewed Safety Question or a change in the Authorization Basis or an Operational Safety Requirement are not implemented without DOE consent and written approval (DOE 5480.21).
7. Management shall ensure that "As Found" conditions which potentially involve an Unreviewed Safety Question or a change in the Authorization Basis or an Operational Safety Requirement that DOE is notified and that appropriate engineering reviews and safety assessments of the condition are performed and submitted to DOE for review (DOE 5000.3B, 5480.21).

3.3.3 How Requirements Are Met

1. The OSR (PORTS GAT/GDP-1074, Parts A through L; PGDP KY-315) provide safety limits, operating limits, surveillance requirements, bases, and administrative controls to ensure safe operations. The OSRs are implemented through site procedures, which are required to be used (both plants UE-SPP-PS-100).
2. System surveillance requirements are contained in the OSRs (PORTS GAT/GDP-1074, Parts A through L; PGDP KY-315). Post-maintenance testing and inspections are performed in accordance with procedures (PORTS OPS-13; PGDP OPS-13). Completed OSR surveillance tests and safety system check sheets are independently reviewed (PGDP P-GP-1).
3. Requirements for initial and periodic testing of safety-class systems are contained in the OSR (PORTS GAT/GDP-1074, Parts A through L; PGDP KY-315). The OSRs are implemented through site procedures, which are required to be used (both plants UE-SPP-PS-100). Completed OSR surveillance tests and safety system check sheets are independently reviewed (PGDP P-ESH-57; PGDP P-GP-1).
4. A management self-assessment program is currently being implemented to monitor the effectiveness of operational safety activities. Management personnel are walking their spaces (both plants, UE2-MC-CI 1003).
5. Shift turnovers are conducted in accordance with written procedures developed to ensure the effectiveness and accuracy of the transfer of information between shift personnel (PORTS OPS-11; PGDP P-GP-104).
6. Proposed changes that involve an Unreviewed Safety Question or a change in the Authorization Basis or an Operational Safety Requirement are not implemented without submission to DOE and without DOE consent and written approval (PORTS-SA-001, PGDP-P-ENG-4).
7. Engineering reviews and safety assessments of the "as found" conditions which potentially involve an Unreviewed Safety Question or a change in the authorization basis or an Operational Safety Requirement are performed and submitted to DOE. "As found" conditions are reported to DOE.

3.3.4 Status of Conformance

The requirements set forth in Section 3.3.2 are met as described in Section 3.3.3 with the following general exceptions:

- Reviews of OSR surveillance tests and safety-systems checks are not yet conducted at PORTS.

3.4 ENGINEERING REVIEWS

3.4.1 Basic Objectives

There shall be a documented review process to ensure (1) that all plant and procedure changes are reviewed to confirm that adequate nuclear safety, and safeguards are maintained and to identify Unreviewed Safety Questions and (2) that appropriate performance requirements are included in procurement specifications for safety system items.

3.4.2 Implementation Requirements

1. Procedures and controls shall be established to ensure appropriate reviews of the following.
 - Each change to procedures and plant or equipment design impacting safety systems to ensure the adequacy of configuration control, radiation, criticality, nuclear safety and safeguards considerations and to maintain appropriate limits (DOE Order 5480.5, DOE Order 5480.21, DOE Order 5480.22, DOE Order 5480.23, and DOE Order 5700.6C).
 - Each procurement document for safety systems to ensure that they contain appropriate information on established radiological and criticality safety requirements and to ensure that vendors shall supply equipment that will perform under expected service conditions (DOE Order 5480.5; DOE Order 5480.21; DOE Order 5480.22; DOE Order 5480.23; and DOE Order 5700.6C).
2. Listings of all changes to plant and equipment safety systems evaluated through the use of engineering reviews, safety assessments and USQDs shall be maintained for each calendar year. Appropriate documentation shall be made available for regulatory oversight review if requested (DOE Order 5480.21, DOE Order 5480.22, DOE Order 5480.23, and DOE Order 5700.6C).
3. Engineering reviews of proposed changes to the plant facilities, procedures, and or tests (or additional tests not included in the authorization basis) which involve an unreviewed safety question or a change in the authorization basis or an operational safety requirement are submitted to DOE for review and concurrence prior to implementation (DOE Order 5480.21).

3.4.3 How Requirements Are Met

1. Procedures and controls have been established as described below

The manager of each nuclear facility (building or operation) is required to notify the nuclear safety organization of any proposed changes to a safety system; any significant facility or process modification, tests, or experiments being performed without an Engineering Service Order (ESO); and any temporary modifications, as defined in plant procedures. The nuclear safety organization reviews these to confirm that adequate radiation protection, criticality safety, and safeguards are maintained and to identify Unreviewed Safety Questions. For significant facility or process modification, tests, or experiments being performed under an ESO, the nuclear safety organization reviews ESO to confirm that adequate radiation protection, criticality safety, and safeguards are maintained and to identify USQ (both plants UEQPP, Criterion 6; PORTS SPP-H-45, Sect. C, SA-001, Sect.6.2; PGDP SPP-P-ENG-4, Sect. 6.2.). Similarly, each procedure change request is screened by a qualified USQ reviewer to determine whether its implementation would involve a USQ (both plants UE2-PS-PS-001, Sect. 6.4). Procedure change requests are also required to be reviewed by a procedure configuration control board, which is required to have representation in sufficiently broad functional areas to enable it to confirm that adequate radiation protection, criticality safety, and safeguards are maintained (PORTS SPP-PS-001, SPP-PS-002; PGDP P-GP-92).

Specific measures have been implemented to require that the information within procurement documents for safety system components conforms to approved specifications. All safety system component purchase orders or bills of materials are required to be marked as requiring special inspections unless the requirement for special inspections is clearly identified on the engineering data sheets from which orders are made. Furthermore, engineering specifies the inspections and quality assurance documentation that are required from the vendors as a condition of purchase for safety system components prior to its acceptance for use within the plants (PORTS SPP-H-31, SPP-H-45; PGDP P-ESH 57, Sect.5.1). Procedures require that engineering approve all data sheets for safety system components before their actual procurement (PORTS SPP-H-31, SPP-H-45; PGDP P-ESH 57, Sect.5.2).

2. Appropriate documentation is maintained at both GDPs (PGDP: P-ESH-20; PORTS: SPP-H-30).
3. Engineering reviews of proposed changes as described in the Implementation Requirements are submitted to DOE for review and concurrence prior to implementation (PORTS-SA-001, PGDP-P-ENG-4).

3.4.4 Status of Conformance

The requirements set forth in Section 3.4.2 are met as described in Section 3.4.3 with the following general exceptions:

- The configuration control process (including as-built drawings) for safety systems is not fully implemented.

3.5 TRAINING AND QUALIFICATION

3.5.1 Basic Objective

Plant personnel must be aware of and trained to recognize and cope with safety hazards and safeguards requirements that they will encounter in their jobs, and they must be appropriately trained and qualified for nuclear safety-related functions they perform.

3.5.2 Implementation Requirements

1. Line managers are responsible for defining training needs and assuring completion of training and demonstration of performance proficiency (qualification) of their employees consistent with their job content (DOE Order 5480.18A, 5480.19, and 5480.20).
2. The independent training organization shall co-develop with line management a description of each organization's training requirements and record status in satisfying these requirements, thereby ensuring effective implementation and control of training activities (DOE Order 5480.20).
3. Plant personnel and visitors or contractors shall successfully complete training in the areas listed below before they are granted unescorted access to controlled areas (DOE 5480.11, and DOE Order 5480.20).
 - Plant radiological, chemical, criticality, and industrial safety hazards;
 - Plant safety rules; and
 - Plant evacuation procedures.

4. Plant personnel shall successfully complete radiation protection training before they are granted unescorted access to radiological areas (DOE 5480.11, and DOE Order 5480.20).
5. As required, personnel shall successfully complete performance based training for safety-related activities. (DOE Order 5480.19, and DOE Order 5480.20).
6. Personnel shall successfully complete nuclear safety and safeguards and security training, retraining and requalification at established intervals. (DOE Order 5480.19, and DOE Order 5480.20).
7. Training requirements shall be defined and training provided to all supervisors and managers with respect to their responsibilities in the areas of safety and safeguards and security (DOE Order 5480.18A, DOE Order 5480.19, and DOE Order 5480.20).

3.5.3 How Requirements Are Met

1. Line management establishes operating standards, communicates performance expectations to all personnel, approves training programs developed jointly with plant training organizations, and verifies successful completion of these programs (reference UE-SPP-TRN-1, 5.0).
2. Both GDPs have dedicated independent training organizations. These training departments serve the operations, production, and maintenance organizations but remain functionally separate. The training departments have dedicated facilities, equipment, and staff to support training functions. The training staff at both facilities is comprised of certified instructors, suitably qualified in their fields and experts in the subjects they teach.

Both plant's training organizations document and track training requirements and completion using training data base software. The training organizations, together with line management, have developed a Training Development and Administrative Guide (TDAG) and Qualification Standard to describe and control training activities. Plant training procedures have recently been reviewed for detail, applicability, and usability.

3. The following safety and safeguard-related training is given to plant personnel and to visitors or contractors who require unescorted access to controlled areas. (Standard Practice and Procedure (SPPs) currently shown as DRAFT are expected to be final by July 1, 1993.)
 - General Topics: Following review of Martin Marietta-Uranium Enrichment (MM-UE) programs, the trainee is expected to be able to identify health and safety programs; employee and visitor responsibilities; and emergency programs, signals, and actions required [PGDP SPP P-ESH-1; PORTS SPP TQ-014 (draft)].
 - Hazard Communication: The purpose of this general overview, awareness-level course is to make every employee aware that hazardous chemicals are present in the workplace and to help them understand the function of warning labels and signs, MSDSs, and the written Hazard Communication Program (PGDP SPP P-ESH-30; PORTS H&S SPP H-58, Sect. J).
 - General Employee Radiation Training: The training covers the employee's responsibilities for maintaining exposures to radiation and radioactive materials as low as reasonably achievable (ALARA). It reviews natural background and man-made sources of radiation, the whole body radiation dose limit for nonradiological workers, the potential biological effects from chronic radiation doses, ALARA concepts and practices; and methods used to control radiological materials (UE-SPP-ESH-5, Sect. 6.2).

- **Emergency Preparedness:** Introduces the trainee to the basic Emergency Preparedness Program elements including: the definition of "emergency" plant safety objectives and priorities, ways to report emergencies, the recognition and correct responses to plant alarm signals, the correct response to evacuations caused by radiological and nonradiological emergencies, personnel accountability; and each employee's responsibilities related to emergencies (PGDP SPP P-ESH-500; PORTS H&S SPP-H-6, Sect. 5.12.4).
 - **General NCS:** The training emphasizes the prevention of accidental nuclear criticality and describes the hazards and risks of a nuclear criticality accident, recall, and criticality safety responsibilities and identifies the proper response to a nuclear criticality alarm (PGDP SPP P-ESH-20; PORTS H&S SPP H-30, Sect. 2.C).
 - **Health and Safety Rights:** Covers the employee's rights and responsibilities and employer duties (PGDP SPP P-ESH-1; PORTS H&S SPP H-24, B.2.).
4. **Radiation Worker Training** includes a comprehensive classroom and practical curriculum consisting of radiological theory and site-specific applications. Proper use of radiological protective clothing and equipment is stressed during the practical exercise (UE-SPP-ESH-5, Sect. 6.3).
 5. Based on job assignment as specified in the TDAG or Qualification Standard, appropriate employees also attend higher level performance based training in the following areas.
 - **Hazard Communication and Chemical Safety** (PGDP SPP P-ESH-30; PORTS H&S SPP H-49, Sect. 6.1.1, SPP H-58, Sect. J).
 - **Lockout/Tagout for Authorized Employee** (PGDP SPP P-ESH-113, SPP P-ESH-116; PORTS H&S SPP M-4, Sect. 5.3.2).
 - **Reproductive Hazards** (UE SPP-ESH-3; PORTS H&S SPP H-64, Sect. 6.1.3.a).

The Emergency Response Training Program is designed to meet emergency response training needs for plant emergency response team personnel. Emergency response team members from key functional areas are trained. Training in these key functional areas is designed to meet the individual training requirements. Documentation of training is maintained within the Safeguards, Security, and Emergency Services Division records or in the plant central training records files.

The Maintenance training programs are designed to provide a skilled workforce that has the technical expertise and safety-related knowledge and skills necessary to ensure the integrity of plant safety systems and/or critical components during maintenance operations. Craft personnel and supervisors are trained in key maintenance functional positions. Training in these key functional positions is designed to meet the individual training requirements. Documentation of training is controlled by the Training Department and maintained by Records Management (UETRN-1, Sect. 1.2; UETRN-6, Sect. 6.2; and UETRN-7, Sect. 7.2).

The Operations training programs are designed to meet the operational training needs for plant operations personnel. Operators and supervisors are trained in key functional positions. Documentation of training is controlled by the Training Department and maintained by Records Management (UETRN-1, Sect. 1.2; UETRN-6, Sect. 6.2; UETRN-7, Sect. 7.2; PORTS PX-008, Sect. 5.2).

Mobile Equipment and Transportation Safety Training Program is designed to meet Mobile Equipment and Transportation training needs to support plant operations. Training in these key functional areas is designed to meet the individual training requirements. Documentation of training

will be maintained with Mobile Equipment and Transportation Safety Training or in the plant central training records files (PGDP SPP P-ESH-102; PORTS H&S SPP H-11).

6. Personnel complete nuclear safety and safeguards and security-related initial training, retraining, and requalification training at established intervals as described in the TDAG, Qualification Standard, or site-specific procedures and policies.
7. Supervisors and managers attend initial training as noted for radiological, chemical, criticality, and industrial safety. In addition, based on documented requirements regarding applicability, supervisors and managers attend additional classroom training on the following subjects.
 - NCS Training for Supervisors (PGDP SPP P-ESH-20; PORTS H&S SPP H-30, Sect. 2.C).
 - Hazard Communication Training for Supervisors (PGDP SPP P-ESH-30; PORTS H&S SPP H-58, Sect. J).
 - Lockout/Tagout Training Issuing Authorities (PGDP SPP P-ESH-113, SPP P-ESH-116; PORTS H&S SPP M-4, Sect. 5.3.2).

3.5.4 Status of Conformance

The requirements set forth in Section 3.5.2 are met as described in Section 3.5.3 with the following general exceptions:

- Performance-based training has not been implemented for all specialties.

3.6 QUALITY ASSURANCE

3.6.1 Basic Objective

A Quality Assurance program shall be established to ensure that planned and systematic actions will provide adequate confidence that nuclear safety and safeguards and security related structures, systems, and components will perform satisfactorily in service.

3.6.2 Implementation Requirements

For nuclear safety and safeguards and security-related systems, structures, components, and related operations, the Quality Assurance Program shall include, as a minimum, the following elements (ANSI/NQA-1, DOE Order 5700.6C).

1. A written Quality Assurance Program which describes the established QA organizational structure, functional responsibilities, levels of authority, duties, and interfaces shall be developed and maintained.
2. Personnel shall be trained and qualified to ensure that they can perform their assigned work and to ensure that job proficiency is maintained.
3. The organization shall establish and implement processes to detect and prevent quality problems. Items and processes that do not meet established requirements shall be identified, acceptably controlled, and corrected.

4. Documents shall be prepared, reviewed, approved, issued, used, and revised to prescribe processes, specify requirements, and establish designs for items that can impact public health and safety. Related records shall be identified, prepared, reviewed, approved, and maintained.
5. Safety-related work shall be performed to established technical standards using appropriate administrative controls and under controlled conditions using approved instructions, procedures, or other appropriate specifications.
6. Safety-related items and processes shall be designed using appropriate standards. Design work, including changes, shall be conducted to applicable requirements and design bases. Design interfaces shall be identified and controlled. The adequacy of design products shall be validated by individuals or groups other than those who perform the work. Verification and validation of work results shall be completed before the design is approved and implemented.
7. The organization shall ensure that procured safety-related items and services meet established requirements and perform as specified.
8. Inspection and acceptance testing of specified items and processes shall be conducted using established performance criteria.
9. Management at all levels shall periodically assess performance to the requirements of the integrated quality assurance program. Problems that hinder the organization from achieving its objectives shall be identified and corrected.

3.6.3 How the Requirements Are Met

For safety and safeguards and security systems, structures, components and related operations, the Quality Assurance Program for the GDPs includes the following elements.

1. The Uranium Enrichment Quality Program Plan (UE QPP) is described in UEO-221, Rev 0, *Quality Program Plan for Uranium Enrichment*. The Quality Assurance program is derived from the consensus standard ANSI/ASME NQA-1 (1989) and meets the requirements set forth in Section 3.6.2.
2. Persons performing Quality Assurance related activities are trained to ensure that they are sufficiently knowledgeable to perform assigned activities (both plants, UE2-MC-11001, UE4-MC-QI1001, and UE4-MC-QI1002).
3. A system of independent assessments to verify compliance with key aspects of the Quality Program and to determine the effectiveness of the program is in place and is implemented through plant policies and procedures (both plants, UE2-MC-11001). Controls for the identification and disposition of nonconforming items are implemented through plant and department policies and procedures [both plants, UE2-MC-CI 1002 (Draft)].

A corrective action system is established to control management of identified deficiencies. Line management determines the root cause of the deficiency and develops a corrective action plan. Corrective actions for deficiencies identified in assessments, occurrence reporting, Health and Safety Review Committee (HSRC) reviews, nonconformance reports, and Lessons Learned are entered in a dedicated database for tracking, trending, and managerial review. Commitments made in connection with completion of corrective actions are entered in a commitment tracking data base. These are independently validated, tracked, trended, and, upon closure, verified with documentation of the complete process [both plants UE2-MC-CI 1001 and UE2-MC-CI 1005 (Draft)].

4. Development, review, approval, distribution, and change control of documents that specify quality requirements or prescribe activities affecting quality are implemented through plant policies and procedures (both plants, UE2-PS-PS1001).
5. Work on safety systems is controlled and performed through the use of approved procedures [both plants, UE2-MC-MC1001 (Draft)].
6. Design controls are implemented through plant and departmental policies and procedures.
 - Applicable design requirements are specified and translated into design documents (both plants, UE2-EN-1002).
 - Design interfaces are identified and controlled [both plants, UE2-EN-1001 (Draft)].
 - Independent reviews and supervisory reviews verify the adequacy of nuclear safety and safety-related designs prior to design implementation [both plants UE2-EN-1003 (Draft)].
 - Control measures commensurate with those applied to the original designs govern design changes, field changes, and nonconformance dispositions (both plants UE2-MC-CI 1002 and UE2-EN-1002).
7. Procurement documentation requirements are implemented through plant policies and procedures (PGDP P-GP-24; PORTS SOP 320.15, SPP-P-1). Controls for procurement of materials, parts, components, and services that are intended for use in designated safety systems are implemented through plant policies and procedures (PGDP P-GP-28, P-GP-48, P-PRO-3, Energy Systems Procurement Division Operating Manual, PORTS procedure required).

Controls for shipping, handling, and storing materials, parts, and components intended for use in safety systems are implemented through plant and department policies and procedures (PGDP P-GP-23; PORTS procedure required).
8. Performance criteria for inspection and testing of work on safety systems are implemented through plant policies and procedures (both plants UE2-MC-QS1001 and UE2-MC-QI1002).
9. Management assessments are conducted considering performance to assigned objectives, trends reviews, performance observation in the workplace, deficiency review, and adequacy of management system documentation [both plants, UE2-MC-CI 1004 (Draft)].

3.6.4 Status of Conformance

The requirements set forth in Section 3.6.2 are met as described in Section 3.6.3 with the following general exceptions:

- Not all procedures required to support the quality assurance program have been prepared and approved.
- Records-management programs for nuclear safety, safeguards and security need to be fully implemented at both plants.
- However, certain compensatory and mitigating actions have been approved by DOE pending full implementation of the QA requirements set forth in section 3.6.2. These compensatory and mitigating actions are described in the following documents:

- PGDP, a letter to the DOE site office dated December 18, 1992. (Subject: Status of 21 Quality Management Systems), and
- for PORTS, a letter to DOE site office dated February 18, 1993. (Subject: Compensatory Actions, Portsmouth).

3.7 MAINTENANCE

3.7.1 Basic Objective

Nuclear safety and safeguards and security-related maintenance shall include effective programs for preventive maintenance, corrective maintenance, and calibration of instruments.

3.7.2 Implementation Requirements

1. A corrective maintenance program shall be implemented to ensure that prompt and effective maintenance is performed on malfunctioning nuclear safety systems, safeguards, and security equipment (DOE Order 4330.4A).
2. A preventive maintenance program shall be implemented to ensure the operability of nuclear safety systems, safeguards, and security equipment (DOE Order 4330.4A).
3. A documented instrument calibration program, employing standards traceable to the national standards system or to nationally accepted standards, shall be implemented for the calibration of equipment and monitoring devices necessary for the proper maintenance and operation of nuclear safety systems and safeguards equipment (DOE Order 4330.4A, DOE 5633.3A, and DOE 5700.6C).
4. Controls shall be established to ensure safety systems are not disabled or diminished by planned activities.

3.7.3 How Requirements Are Met

1. The corrective maintenance program ensures that facility systems, structures, and components are returned to their designed condition in a timely and effective manner (both plants; Maintenance Implementation Plan, Sect. 3, MAP-WC-001, MAP-CM-001, MAP-PSC-001, and MAP-PCU-001; PORTS SPP-M-1, SPP-PS-001, SPP-PS-002, SPP-PS-003, SPP-PS-004).
2. The operability of nuclear safety systems is ensured by proper application of surveillance testing and preventive maintenance program elements. The preventive maintenance program uses a computer data base to track and report program performance. Preventive maintenance schedules are derived from vendor recommendations, engineering analysis, and 40 years of operating experience (both plants, MAP-PM-001; PORTS MAP-PM-002).
3. All nuclear safety-related measuring and test equipment standards are included in the plant recall system and are calibrated using procedures that provide for traceability to National Institute of Standards and Technology (NIST). Measurement control programs are in place to assure that equipment used to measure SNM is calibrated in a manner traceable to national standards (PORTS POEF 1197, Sect. 6.0; PGDP KY/D-3899, Sect. III.D).
4. A Safety System Permit is required at PGDP when a designed "safety system" will be disabled, diminished, or affected by planned tasks. At PORTS, work on safety systems is controlled by

marking the Safety System block on the Maintenance Service Request (MSR) when requesting maintenance for safety systems and using the Safety System Data Sheet to Document the work.

3.7.4 Status of Conformance

The requirements set forth in Section 3.7.2 are met as described in Section 3.7.3.

3.8 RADIATION PROTECTION PROGRAMS, SYSTEMS, DESIGNS, AND PERMITS

3.8.1 Basic Objective

The radiation exposure of employees, contractors, and visitors and the release of radioactive effluents to unrestricted areas shall be maintained as far below the regulatory limits as is reasonably achievable, economic and societal factors being taken into account.

3.8.2 Implementation Requirements

1. A radiation control program that defines steps to be taken to limit exposure of workers and the public shall be established (DOE Order 5480.5, DOE Order 5480.11).
2. Line management shall be responsible for radiation protection (DOE Order 5480.11).
3. A radiation protection organization, independent of production or operations, shall be provided to guide and assist line managers in fulfilling their radiation protection responsibilities (DOE Order 5480.11).
4. A radiation protection manager shall be provided to advise and consult with line managers and to guide the radiation protection activities (DOE Order 5480.11).
5. Instructions concerning all the activities of radiation protection technicians shall be provided. Radiation protection procedures for the control and use of radioactive materials and radiation-generating devices shall provide for safe operations (DOE Order 5480.11).
6. A formally structured, auditable ALARA program with established milestones to ensure that exposures are maintained at ALARA levels shall be in place (DOE Order 5480.11).
7. A respiratory protection program to limit the intake of airborne radioactive materials and to protect employees from potentially hazardous atmospheres shall be established (DOE Order 5480.11).
8. A bioassay system shall be established that will evaluate Committed Effective Dose Equivalents (CEDE) to personnel who are occupationally exposed to radiation with the likelihood to receive intakes of 100 mrem or more (CEDE) (DOE Order 5480.11).
9. Engineering and administrative controls and personal protective equipment shall be used to control the exposure of employees to internal radiation sources; occupational exposures shall be evaluated and recorded when the potential exposure could exceed 2% of the regulatory limit (DOE Order 5480.11).
10. Employee exposure to external radiation sources shall be controlled using postings, interlock systems, monitoring, and surveys. Occupational exposures shall be evaluated and recorded when the potential exposure could exceed 2% of the annual limit for effective dose equivalent. Exposure of extremities and the skin shall be evaluated as appropriate (DOE Order 5480.11).

11. Radiation areas, high radiation areas, very high radiation areas, contamination areas, high contamination areas, airborne radioactivity areas, and radioactive materials (storage) areas shall be prominently and distinctly marked to preclude inadvertent or unknowing entry by employees, visitors, and contractors (DOE Order 5480.11).
12. Plant alarms to alert personnel in and around facilities of emergency conditions or impending hazards shall be provided (DOE Order 5480.11).
13. The radiation monitoring and contamination control program shall ensure worker protection from radiation exposures. Sources of radioactive contamination shall be controlled at the source and steps shall be taken to limit the extent of contamination. The extent of contaminated areas shall be limited by vigorous decontamination efforts (DOE Order 5480.11, DOE Order 5480.1B).
14. Airborne radioactive materials, surface contamination, and external radiation exposures shall be monitored and surveyed to assure that employee internal accumulations of radioactive materials can be routinely estimated and to ensure that exposures are at ALARA levels (DOE Order 5480.11, DOE Order 5480.1B).
15. Personnel dosimetry shall be used and maintained so that results will be accurately determined (DOE Order 5480.15, DOE Order 5480.11).
16. A formal inventory program to account for nonexempt byproduct material sources and to provide for their control, movement, and leak testing shall be maintained (DOE N5400.10).
17. Provisions shall be made to provide for oversight of radiation protection programs. The audit program for both routine operations and unusual radiological occurrences shall provide for adequate assessment of performance (DOE Order 5480.11).
18. A Radiation Work Permit (RWP) system to ensure that radiation exposure and contamination controls are applied to all activities involving entry into radiation, airborne radioactivity, and contamination areas and to other work areas with radioactive materials shall be established (DOE Order 5480.11).
19. Radiation protection instructions to workers such as RWPs shall be available for review at the entry of the work area to which they apply (DOE Order 5480.11).
20. Radiation measuring instruments used to evaluate hazards or define employee exposure shall be subject to periodically scheduled maintenance and calibration in accordance with approved procedures; the sources of radiation measured will be NIST traceable (DOE Order 5480.11).
21. Employees shall be provided with an annual report of their occupational exposure history in accordance with Paragraph 9.n of DOE Order 5480.11, and visitors shall be provided with information with respect to their exposure in accordance with Paragraph IV.3.d of DOE Order 5484.1A. Summary exposure information containing the data specified in Paragraph IV.4.a of DOE Order 5484.1A shall be reported annually to DOE (DOE Order 5480.11 and DOE Order 5484.1A).
22. Records related to occupational radiation exposure shall be maintained in a manner that permits easy recovery of the data, allows for trend analysis, and aids in the protection of the individual and the control of radiation exposure (DOE Order 5480.11, DOE 1324.2A, and DOE 1324.5A).
23. An occupational health program shall be established to oversee, promote, and protect the radiological and nonradiological health of plant personnel.

3.8.3 How Requirements Are Met

1. A radiation protection program consisting of specific radiation protection procedures has been established (see UE-SPP-ESH-2-14).
2. Radiation Protection, Maintenance, and Operations procedures list and assign line managers' and supervisors' responsibilities for radiation protection.
3. Each GDP has a dedicated radiation protection organization that is separate from the GDP operations and production and maintenance operations.
4. Radiation Protection Managers have been designated at both plants.
5. Operating procedures and instructions concerning the activities of the Radiation Protection Technicians have been prepared and are incorporated in departmental procedures at both plants.
6. The approved ALARA program requires that the radiation protection staff review employee radiation exposures, the results of air and contamination monitoring, proposed operating procedures, and other technical documents used in pre-job planning, incident and occurrence reports, and other information pertinent to the reduction of exposure. Lessons learned from such reviews are distributed and made available throughout the plants. ALARA reviews are also conducted when new facilities are designed and when existing facilities and processes are modified (both plants, UE-SPP-ESH-3, Sect. 5.3; UE-SPP-ESH-6; UE-SPP-ESH-7, Sect. 7; UE-SPP-ESH-8, Sect. 5.3, 6, and 7).
7. A respiratory protection program has been established to govern the selection and use of respirators to reduce the internal exposure of employees. Procedures govern related training, define the medical qualifications and fit testing of employees, and ensure employee medical fitness to use respiratory protection (PGDP P-ESH-9; PORTS SPP-H-42).
8. Routine urinalysis programs are conducted to determine the uptake of uranium compounds. In vivo analysis is performed upon selected employees working in restricted (radiological) areas. Dose estimates, using standard programs, are made as required (both plants, UE-SPP-ESH-8, Sect. 5.3, 6, and 7).
9. Engineering controls, postings, personnel monitoring, and protective clothing are used to control the spread of radioactive materials in the workplace. Containment devices to control contamination at the source are being introduced at the two sites. Decontamination, where required, is being conducted and achieves ALARA objectives (both plants, UE-SPP-ESH-6).
10. All employees, contractors, and visitors who work within or who have reason to enter the restricted areas of the plant are provided with a TLD. Restricted areas within the plant are posted. Also see paragraphs 11, 12, 18, and 19.
11. Radiation Areas, High Radiation Areas, Airborne Activity Areas, High Airborne Radioactivity Areas, Contamination Areas, High Contamination Areas, Controlled Areas, Radiological Areas, and Radioactive Materials Storage Areas are posted with warning signs (both plants; UE-SPP-ESH-6, Sect. 6.1).
12. Alarm systems are installed to provide visual or audible warning signals to alert personnel to evacuate or to refrain from entering areas where high external radiation fields exist or where a criticality event may have occurred. These systems are periodically tested (both plants, UE-SPP-ESH-11, UEHP-E-2, UEHP-E-4.). (See also the Sect. on Nuclear Criticality.)

13. The contamination control program incorporates radiological monitoring, radiological survey inspections, audits, reviews, investigations, training, and the use of portable containment structures to maintain program effectiveness (both plants, UE-SPP-ESH-6).
14. Continuous and periodic air sampling and periodic contamination surveys are performed routinely using calibrated instruments in accordance with approved procedures. Material, tools, equipment, and personnel leaving contaminated areas are surveyed for contamination before release. Nonradiological areas are surveyed periodically. Personnel also perform self-monitoring when leaving radiological (restricted) areas (both plants, UE-SPP-ESH-6, Sect. 6.5).
15. The external dosimetry program at PGDP and PORTS are DOELAP accredited. DOELAP is DOE's accreditation program for dosimetry and is similar to NVLAP (both plants, UE-SPP-ESH-7, Sect. 5.22 and 7).
16. A source custodian is designated for each nonexempt, sealed, byproduct material source and for each radiation-producing machine. Central filing systems, computer inventories are maintained for radioactive materials sources, and radiation-generating machines. These inventories are validated by physical inventory. Leak testing of sealed sources is accomplished at specified intervals (both plants, UE-SPP-ESH-12, Sect. 5.9, 6.9, 6.11; UEHP-O-11, Sect. 8).
17. Audit teams conduct audits and surveillances of radiological activities to determine adequacy, compliance, and effectiveness of radiation protection programs by investigation, examination, and evaluation of established procedures, instructions, drawings, and other applicable documents. See also the sections on MC&O and Quality Assurance (both plants, UE-SPP-ESH-2, Attachment).
18. RWPs are completed in accordance with plant procedures (both plants, UE-SPP-ESH-9).
19. RWPs are posted at the entry of appropriate restricted areas, airborne radioactivity areas, and contamination areas. RWPs are also required for performing any task that involves exposure to radiation or to radioactive materials above established limits. The RWP specifies monitoring and entry and exit requirements and the level of personal protective equipment required (both plants, UE-SPP-ESH-9, Sect. 5).
20. Radiation protection instruments are calibrated and maintained periodically (both plants, UE-SPP-ESH-10, Sect. 5.6 and 6.1).
21. Employees are given annual dose summaries. Employee doses are trended and tracked. Other radiation protection-related operational-type records are also maintained (both plants, UE-SPP-ESH-2, Attachment; UE-SPP-ESH-3, Sect. 5.3; UE-SPP-ESH-7, Sect. 6 and 7; UE-SPP-ESH-8, Sect. 5.3, 6, and 7; UE-SPP-ESH-13). (See also the sections on MC&O and Quality Assurance.)
22. Records to document the conduct of monitoring activities and surveys of occupational doses received by employees, contractors, and visitors are prepared and maintained.
23. Medical staffs perform required medical examination, review records of occupational exposure, define biological monitoring requirements and interpret results, investigate overexposure, and otherwise support the occupational medicine programs at both plants.

3.8.4 Status of Conformance

The requirements set forth in Section 3.8.2 are met as described in Section 3.8.3 with the following general exceptions:

- The UE-SPP procedures and plant Health Physics procedures are not internally consistent.
- Prescribed survey frequencies are not consistently being met.
- The radiation protection record keeping procedures have not been fully implemented.
- Radiation warning signs and other signs need to be made consistent on a plant-wide basis.
- Issues with respect to the management of fixed and removable contamination need to be resolved.
- The in vivo counter at PGDP requires upgrade, new calibration phantoms, and upgraded software in order to be functional at a state-of-the-art level.
- Additional personnel contamination monitors, and other contamination control instrumentation are needed to support program activities.

3.9 NUCLEAR CRITICALITY SAFETY

3.9.1 Basic Objectives

A NCS Program shall provide the necessary elements to protect personnel from potentially dangerous effects of a nuclear criticality accident. This goal shall be accomplished by implementing administrative and engineered process controls. These controls will minimize the possibility of a nuclear criticality accident, and implementing emergency response plans will minimize personnel exposure if a nuclear criticality accident occurs.

3.9.2 Implementation Requirements

1. Management shall be responsible for the safety of operations. Responsibility for NCS shall be clearly defined and established. Management shall provide personnel skilled in the interpretation of data pertinent to NCS and familiar with operations to serve as advisors to supervision (ANSI 8.1, DOE Order 5480.24).
2. Before a new operation with fissionable materials is begun or before an existing operation is changed, the entire process must be shown to be subcritical under both normal and credible abnormal conditions. This demonstration includes a peer review of NCS evaluations. NCS evaluations shall determine and explicitly identify the controlled parameters and their associated limits upon which NCS depends (ANSI 8.1, DOE Order 5480.24).
3. Process designs shall, in general, incorporate sufficient factors of safety to require that at least two unlikely, independent, and concurrent changes in process conditions occur before a criticality accident is possible. A single means of preventing a nuclear criticality accident is acceptable, provided the process control is determined to be adequately reliable within an approved Final Safety Analysis Report. Where practicable, equipment design, in which dimensions are limited, rather than administrative controls shall be relied upon. Full advantage may be taken of any nuclear characteristics of the process materials and equipment. All dimensions and nuclear properties which are relied upon shall be verified before operations begin, and control shall be exercised to maintain them (ANSI 8.1, DOE Order 5480.24).
4. NCS training programs shall be established (ANSI 8.20, DOE Order 5480.20).

5. Fissile materials labeling and area posting, specifying material identification and all limits on parameters that are subject to procedural control, shall be maintained (ANSI 8.1, DOE Order 5480.24).
6. Operations to which NCS pertains shall be governed by written procedures. All persons participating in these operations shall understand and be familiar with these procedures. The procedures shall specify parameters which must to be controlled. The procedures shall be structured in such a way that no single departure from a procedure can cause a criticality accident (ANSI 8.1, DOE Order 5480.24).
7. Deviations from procedures and unforeseen alterations in process conditions that affect NCS shall be reported to appropriate management and shall be documented and investigated promptly. Action shall be taken to prevent recurrence (ANSI 8.1, DOE Order 5000.3B).
8. Operations shall be reviewed periodically to ascertain that procedures are being followed and that process conditions have not been altered so as to affect the NCS of the operation. Qualified individuals who are knowledgeable of the operation shall conduct these reviews, and they shall be documented (ANSI 8.1, DOE Order 5480.24).
9. Reliance may be placed on neutron-absorbing materials that are incorporated in process materials, or equipment, or both. When absorbers are used as a primary or secondary NCS control, appropriate precautions shall be exercised to maintain their continued presence with the intended distributions and concentrations (ANSI 8.5, DOE Order 5480.24).
10. Where applicable data are available, subcritical limits shall be established on bases derived from experiments, with adequate allowance for uncertainties in the data. In the absence of directly applicable experimental measurements, the limits may be derived from calculations made by a method validated by comparison with experimental data (ANSI 8.1, DOE Order 5480.5).
11. Criticality accident alarm systems shall comply with ANSI 8.3, 1986 (DOE Order 5480.24).
12. Emergency response planning for a criticality accident shall comply with ANSI 8.19, 1984 (DOE 6430.1A).

3.9.3 How Requirements Are Met

1. Plant procedures at the GDPs designate management responsibilities concerning NCS. A staff of NCS specialists within the Health and Safety Divisions at the GDPs provide the necessary technical oversight for implementing the NCS program. NCS staff members become qualified through on-the-job training under the supervision of experienced professionals. Qualification requirements have been established for NCS engineers and are used in selection of NCS engineers (PGDP P-ESH-20, Sect. 5.0; PORTS SPP-H-30).
2. Documented NCS evaluations are used to determine and identify the limits and controls required to provide NCS for new or modified operations. NCS evaluations are peer reviewed before NCS approvals are issued and before an operation starts up (PGDP P-ESH-20, Sect. 5.3; PORTS SPP-H-30).
3. NCS engineers review the design of fissionable processes before new operations or modifications to existing operations are started up. Safe geometries have been used for NCS where practical. Physical controls, rather than administrative controls, are relied upon for NCS in fissionable material operations where practical. In general, process designs meet the double contingency principle. Approved exceptions to the double contingency principle adopted at the GDPs are

documented in approved Final Safety Analysis Reports and USQs (PGDP P-ESH-20, Sect. 6.0; PORTS SPP-H-30).

4. The Training Department administers NCS training. NCS staff members are directly involved in the NCS training program as subject matter experts and review and approve all lesson plans (PGDP P-ESH-20, Sect. 5.3.1; PORTS SPP-H-30).
5. Procedures are in place requiring the posting of permanent fissile material storage areas (PGDP P-ESH-20, Appendix B). (PGDP P-ESH-20, Sect. 5.1.3; PORTS SPP-H-30).
6. Operations involving fissile material have operational procedures which are marked "safety related" (PGDP P-GP-1, Sect. 6.5.3). The Nuclear Safety staff reviews safety-related procedures to ensure that NCS requirements are incorporated. NCS controls are implemented in plant operational procedures (PGDP P-ESH-20, Sect. 5.1.3; PORTS SPP-H-30).
7. Procedure violations and incidents which affect NCS are tracked within the NCS program as well as within the plant occurrence reporting program system. Corrective actions are generated within the occurrence reporting system to address programmatic and system deficiencies (PGDP P-GP-43, Sect. 5.6; PORTS SPP-H-30).
8. NCS specialists review fissionable material operations periodically in conjunction with other safety specialists. The reviews are conducted through a "walking the spaces" program as well as through a formal surveillance program to ensure that NCS controls are properly implemented (PGDP P-GP-46, Sect. 5.4.2; PORTS SPP-H-30).
9. Neutron absorbers materials are installed in accordance with applicable standards (ANSI 8.5, 1986).
10. NCS limits are based either directly or indirectly upon experimental data. Indirect methods such as computer software calculations are validated. The validation of computer software addresses the safety margin and calculational bias in accordance with ANSI 8.1.
11. The need for criticality accident alarm systems is evaluated for all activities in which the inventory of fissionable material in individual, unrelated areas exceeds 700 grams of ^{235}U . The design of the alarm system and procedural requirements reduce the frequency and impact of false alarms. The radiation detection systems and alarm signals are uniform within each GDP. (PGDP P-ESH-84, Sect. VII.B) The criticality alarm system is tested periodically to confirm continuing instrument performance. Tests are documented in accordance with plant procedures. When tests reveal inadequate performance of the criticality alarm system, corrective action is taken without unnecessary delay (PGDP P-ESH-84, Sect. VI; PORTS SPP-H-30). A design criteria waiver for this alarm system has been approved by DOE.
12. Both sites have emergency response plans which deal with criticality accidents. Employees who work in areas where exposure to radiation resulting from a criticality accident might occur receive annual training in emergency response to a criticality alarm system. Employees are familiarized with the sound of the alarm system through both training and periodic alarm system drills (PGDP P-ESH-84, Sect. VI; PORTS SPP-H-30).

3.9.4 Status of Conformance

The requirements set forth in Section 3.9.2 are met as described in Section 3.9.3 with the following general exceptions:

- The documentation of the application of the double contingency (or exemption waivers) for process designs in operation prior to 1992 is not adequate. Documentation is in the process of being upgraded by the GDPs in conjunction with the FSAR upgrade activities.
- Posting of operational limits and improved labeling for NCS are scheduled to be completed by June 1994.
- At PORTS, SPP-H-30, "Nuclear Criticality Safety," is being revised.
- Raschig rings used as a primary control meet the criteria of ANSI 8.5, 1986 at the time of installation, however surveillance requirements do not meet the criteria.
- Job-specific NCS training of maintenance personnel is being added to the training program at PGDP. The maintenance personnel will be fully trained by June 1994.

3.10 FIRE PROTECTION

3.10.1 Basic Objective

The Fire Protection Program shall ensure that no undue threats to the public or employees will result from fire and resultant perils.

3.10.2 Implementation Requirements

Requirements necessary to implement an adequate standard of protection include the following elements:

1. Strong management commitment to fire protection shall be provided along with policy statements that implement specific plant criteria (DOE 5480.7).
2. The Fire Protection Program shall be under the direction of an individual who has been assigned as Authority Having Jurisdiction (AHJ) commensurate with the responsibilities of the position (DOE 5480.7).
3. Fixed fire suppression systems, where provided, shall be tested and maintained such that fires in those areas are controlled promptly (DOE 5480.7).
4. Automatic fire suppression systems shall be provided for areas containing safety systems (DOE 5480.7).
5. A reliable water supply, with sectional isolation valves shall be maintained (DOE 5480.7).
6. Closing of valves supplying fire suppression systems shall be controlled by a written permit system (DOE 5480.7).
7. A fire department shall be maintained on-site as an acceptable means of redundant fire protection (DOE 5480.7).
8. Fire Department personnel shall be on-site at all times and shall be trained and equipped to handle anticipated types of fires and other emergencies (29 CFR 1910.156).
9. Mobile fire apparatus that is required to support fire fighting operations shall be provided and maintained (DOE 5480.7).

10. Manual fire suppression equipment and/or systems shall be provided in order that at least one effective hose stream can reach any area within an important building (DOE 5480.7).
11. Breathing air used in fire fighting shall meet a minimum quality of Grade D (29 CFR 1910.134).
12. On-site fire protection support shall be available to evaluate the fire hazards of changes to maintenance and process systems (DOE 5480.7).
13. A fire protection review of design documents for new facilities and for modifications to existing facilities shall be made to insure that fire protection issues have been properly addressed (DOE 5480.7).
14. Fire protection appraisals of important buildings shall be conducted periodically to identify changes that adversely impact existing fire protection levels. Means of emergency egress shall be regularly inspected for all areas that are normally occupied. Personnel who are trained and knowledgeable in detecting fire hazards shall conduct periodic inspections of all important buildings and other structures (DOE 5480.7).
15. All fires shall be investigated and root causes determined (DOE 5500.3A).
16. Portable fire extinguishers shall be available throughout the plant commensurate with the hazard (29 CFR 1910.157).
17. A fire alarm system that reports to a continuously manned location shall monitor fire alarms in all important buildings and structures (DOE 5480.7).
18. Welding/burning/hot work shall be controlled by a written permit system to minimize the fire hazards of open flame equipment (DOE 5480.7).
19. Emergency medical services shall be provide to assure proper emergency care of injured employees (29 CFR 1910.151).

3.10.3 How Requirements Are Met

The methodology employed in order to comply with requirements includes the following components:

1. Management commitment to fire protection as found in the GDPs Fire Protection Programs (PGDP P-ESH-21; PORTS SPP-S-20).
2. Direction of the Fire Protection Program has been delegated to the Fire Services Department manager at Paducah and the department head of Fire Services at Portsmouth as the AHJ for fire protection and egress issues.
3. Fixed fire suppression systems are tested and maintained in accordance with approved plant procedures.
4. Automatic fire suppression is provided for areas containing safety systems. Redundant fire suppression capability is provided by on-site fire departments at both GDPs.
5. A reliable water supply, with sectional isolation valves, is maintained. Reliability is established through the use of multiple pumps and an elevated water tank.

6. Closing of valves supplying fire suppression systems is controlled by a written permit system (PGDP P-ESH-17; PORTS FP 1.2, FP 1.3).
7. A fire department is maintained at both GDPs as a means of redundant fire protection.
8. Fire Department personnel are on site at all times and are trained and equipped in accordance with departmental procedures.
9. Mobile fire apparatus is provided and maintained in accordance with departmental procedures.
10. Manual fire suppression capability is provided by means of interior hose stations or connections or by the use of fire hoses from mobile fire apparatus such that one effective hose stream is capable of reaching any area within an important building.
11. Breathing air used for fire protection meets the minimum quality of Grade D and is sampled periodically (PGDP P-ESH-9; PORTS SPP-H-43).
12. On-site fire protection engineering support is provided to evaluate the fire hazards of changes in maintenance and process systems. Review by appropriate Fire Protection personnel of proposed changes is required by the charge control process.
13. Fire protection engineering reviews of the design documents for new facilities and modifications to existing facilities are routinely conducted (PGDP P-ESH-21; PORTS SPP-S-20).
14. Fire protection appraisals of important buildings and structures are conducted periodically to identify changes that adversely impact the level of fire protection provided. Means of egress for normally occupied areas are regularly inspected. Trained Fire Department personnel conduct these inspections (PGDP P-ESH-21, PORTS SPP-S-20). Means of emergency egress are regularly inspected in accordance with departmental procedures for all normally occupied areas.
15. All fires are investigated and the cause determined in accordance with departmental procedures.
16. Portable fire extinguishers are positioned throughout the GDPs commensurate with hazards present in the area.
17. A fire alarm system reporting to continuously manned locations which monitors fire alarms in all important buildings and structures is operational at both GDPs (PGDP P-ESH-21).
18. Welding/burning/hot work is controlled by a written permit system (PGDP P-ESH-64, PORTS SPP-M-4).
19. State-certified emergency medical technicians in the fire departments provide emergency medical response with transport capability to an off-site facility.

3.10.4 Status of Conformance

The requirements set forth in Section 3.10.2 are met as described in Section 3.10.3 with the following general exceptions:

- The process buildings do not conform to the life safety code requirements for emergency egress because travel distances are too long. An exemption for the travel distance requirements is currently pending DOE approval.

3.11 ENVIRONMENTAL PROTECTION

3.11.1 Basic Objective

Radioactive effluents released to the environment from USEC Operations shall be maintained as far below regulatory limits as is reasonably achievable, in order to protect the health and safety of the general public.

3.11.2 Implementation Requirements

1. A program of environmental surveillance monitoring shall be in place to determine the effects that on-site airborne radioactive emissions have on off-site environmental locations, natural resources, and the public health (DOE Order 5400.1, DOE Order 5400.5).
2. A program to obtain and maintain representative meteorological data to comply with regulations requiring the assessment of the impact of radioactive airborne releases shall be maintained (DOE Order 5400.1, DOE Order 5400.5).
3. Sampling and analysis of radionuclides in environmental media shall be conducted in such a way as to provide representative defensible data (DOE Order 5400.1, DOE Order 5400.5).
4. A program to estimate radiation dose limits for members of the public shall be maintained (DOE Order 5400.1; DOE Order 5400.5 40 CFR 61, Subpart H).

3.11.3 How Requirements Are Met

1. Air monitoring of radionuclides is conducted in accordance with the GDPs' environmental monitoring plans (PGDP KY-E-118; "PORTS Environmental Monitoring Plan," November 12, 1991). The results of the air monitoring programs are reported in the GDPs' annual Environmental Reports ("PGDP Environmental Report for 1992"; PORTS, "Portsmouth Gaseous Diffusion Plant Environmental Report for 1992" [Draft]). All atmospheric releases from sources which have the potential, with no controls, to produce an effective dose equivalent (EDE) to the most affected area resident greater than 0.10 mrem per year are continuously monitored for radionuclide effluents.
2. Each GDP is collecting meteorological data to document wind speed and direction, barometric pressure, relative humidity, and rainfall. This information is used to forecast atmospheric dispersion in the event of unplanned radioactive materials releases or other events causing concern for the public health and safety. Due to calibration difficulties and lightening damage at PORTS, the meteorological data may not be representative (PGDP KY-E-118; PORTS Environmental Monitoring Plan, November 12, 1991).
3. Air measurements of radionuclides are made in accordance with the GDPs Monitoring Plans and "Standard Methods" (PGDP KY-E-118; "PORTS; Environmental Monitoring Plan," November 1992).
4. Programs are implemented to determine radiation dose for members of the public near the facility (PGDP KY-E-118; PORTS Environmental Monitoring Plan, November 12, 1991).

3.11.4 Status of Conformance

The requirements set forth in Section 3.11.2 are met as described in Section 3.11.3 with the following general exceptions:

- The meteorological monitoring equipment at PORTS is difficult to calibrate, due to age and lightning damage, and may not be producing adequate data to support dispersion calculations and dose assessments. New equipment is being procured.

3.12 NUCLEAR MATERIAL SAFEGUARDS

3.12.1 Basic Objective

A documented program shall be implemented (1) to protect SNM from unauthorized removal, (2) to control and account for SNM using standard methods; and (3) to protect SNM facilities against radiological sabotage.

3.12.2 Implementation Requirements

The program for safeguarding and accounting for special nuclear material shall include the following elements:

1. Written plans and procedures that identify the strategies, mechanisms, and commitments to protect SNM from unauthorized removal, to account for SNM, and to protect SNM facilities against radiological sabotage, including:
 - Physical Security Protection Plans (DOE Order 5632.2A),
 - Protective Force Procedures (DOE Order 5632.7 and 5632.7.1), and
 - Nuclear Materials Control and Accountability Plans (DOE Order 5633.3A)
2. A system for tracking, accounting for, and reporting to the Nuclear Materials Management and Safeguards System (NMSS), all special nuclear material above threshold limits that has been received and is present on all plant sites (DOE Order 5633.3A, 5633.4, and 5633.5A).
3. A measurement control program for ensuring that equipment used to measure nuclear materials is properly calibrated using standards traceable to national standards and for supporting the estimation of the contribution of measurement uncertainty to inventory difference (DOE Order 5633.3A).
4. Physical barriers, vaults, intrusion detection systems, and access controls designed to protect SNM from access by unauthorized personnel or from unauthorized removal (DOE Order 5632.2A)
5. A trained protective force to respond to unauthorized attempts to gain access to, or to remove, SNM (DOE Orders 5632.2A, 5632.7, and 5632.7.1).
6. A fitness for entry program to reduce the likelihood of SNM theft or radiological sabotage by ensuring a drug-free and alcohol-free workplace (DOE Order 5480.8A).
7. A system of independent audits and assessments to verify the effectiveness of the elements of the NMC&A program, including measurement controls, material controls, and accounting systems (DOE 5633.3A).
8. A system of performance testing to verify the effectiveness of the SNM protection program (DOE Orders 5630.16 and 5632.8).
9. A program for providing such information about, and such access to, GDP facilities and operations as may be required to support the United States in meeting its obligations to the International Atomic Energy Agency (IAEA) relating to SNM safeguards at the GDPs (DOE Order 1270.2B).

3.12.3 How Requirements Are Met

1. The GDPs maintain written plans and procedures that identify the strategies, mechanisms, and commitments to protect SNM from unauthorized removal, to account for SNM, and to protect SNM facilities against radiological sabotage (PORTS POEF-1197; PGDP KY/D-3899), including
 - a) Physical Security Protection Plans (classified reference);
 - b) Protective Force Procedures (classified reference); and
 - c) Nuclear Materials Control and Accountability Plans.
2. The GDPs maintain nuclear material accounting systems to track, to account for, and to report to the Nuclear Materials Management and Safeguards System (NMSS), all special nuclear material above threshold limits that has been received and is present on all plant sites (PORTS POEF 1197, PGDP KY/D-3899).
3. The GDPs maintain measurement control programs to assure that programs used to measure nuclear materials are calibrated in a manner that is traceable to national standards. These programs are capable of developing information to support the estimation of the contribution of measurement uncertainty to inventory differences (PORTS POEF 1197, Sect. 6.0; PGDP KY/D-3899, Sect. III.D).
4. The GDPs employ physical barriers, including fences and hardened structures; vaults; intrusion detection systems; and access controls to protect SNM from access by unauthorized personnel or from unauthorized removal (both sites' Site Safeguards and Security Plan).
5. The GDPs maintain trained protective forces to respond to unauthorized attempts to gain access to, or to remove, SNM (both sites' Site Safeguards and Security Plan).
6. The GDP fitness-for-duty program includes preemployment drug screening and for-cause drug testing. Positive test results, which are rare, are dealt with on a case-by-case basis. The fitness-for-duty program also includes an employee assistance program that is available to employees and members of their families.
7. Audits and assessments are performed to verify the effectiveness of the elements of the NMC&A program, including measurement controls, material controls, and accounting systems (PORTS POEF 1197, Sect. 9.0; PGDP KY/D-3899 Sect. II.F, P-GP-46).
8. The GDPs employ performance testing to verify the effectiveness of the SNM protection program (both sites' Site Safeguards and Security Plan).
9. The GDP nuclear material and accounting systems are capable of providing such information about the status of SNM at the GDPs as may be required to support the United States in meeting its obligations to the IAEA relating to SNM safeguards at the GDPs (PORTS POEF-1197, PGDP KY/D-3899).

3.12.4 Status Of Conformance

The requirements set forth in Section 3.12.2 are met as described in Section 3.12.3.

3.13 EMERGENCY PREPAREDNESS

3.13.1 Basic Objective

The Emergency Preparedness Program shall ensure that adequate protective measures can be taken in the event of an emergency.

3.13.2 Implementation Requirements

1. An individual shall be designated to administer the emergency management program. An emergency response organization shall be established, and responsibilities of all individuals supporting emergency response are clearly defined (DOE Order 5500.3A).
2. A hazards assessment shall be developed and maintained for use in emergency planning. This assessment shall consider the broad spectrum of events that could affect the facility and be used in the development of the Emergency Plan (DOE Order 5500.3A, DOE Order 5480.1B).
3. An Emergency Plan shall be developed and maintained as a controlled document. The Emergency Plan and its associated support documents shall be reviewed and updated as appropriate, annually (DOE Order 5500.3A).
4. Emergency planning support and coordination relationships with federal, state, and local organizations shall be developed and formally documented through plans, agreements, and memoranda of understanding (DOE Order 5500.3A).
5. An assured means of promptly notifying the federal, state, and local authorities of the details of an emergency shall be installed and maintained (DOE Order 5500.3A).
6. Emergency response activities shall be coordinated with federal, state, and local agencies and organizations and facility officials through continued communication during the event (DOE Order 5500.3A).
7. Facilities and equipment, adequate to support emergency response shall be established and maintained. An emergency operations center that it is capable of adequately supporting assessment, evaluation, and direction of emergency response organization activities shall be established (DOE Order 5500.3A).
8. The EOC shall be habitable in all postulated emergencies, or an alternate EOC shall be established and maintained (DOE Order 5500.3A).
9. Provisions shall be in place to adequately assess the actual or potential consequences of an emergency. Specific predetermined actions to be taken in response to postulated emergency conditions shall be developed (DOE Order 5500.3A).
10. An adequate record or log of emergency response actions shall be kept (DOE Order 5500.3A).
11. Arrangements for medical treatment for injuries sustained in postulated emergencies, including radiologically related injuries, shall be in place (DOE Order 5500.3A).
12. Provisions shall be made for recovery from an emergency and reentry into affected buildings. These provisions shall include specific procedures for termination of an emergency, dissemination of information, establishment of a recovery organization, and criteria for resumption of normal operations (DOE Order 5500.3A).

13. A public information program shall be established and integrated into the emergency management program (DOE Order 5500.3A, and DOE Order 5500.4).
14. Training for emergency response organization individuals on their duties in the emergency response plan shall be developed and delivered on an established schedule (DOE Order 5500.3A).
15. The emergency plan shall be exercised, including opportunities for off-site agency participation, at least annually (DOE Order 5500.3A, and DOE Order 5500.10).

3.13.3 How Requirements Are Met

1. At PGDP, the Emergency Management Department Manager is designated as the emergency management program administrator. Responsibilities for the administrator and emergency response organization members are described in the PGDP Emergency Management Plan (PEMP, KY/H-143, Sect. 3). The requirements of the PEMP are implemented by procedure SPP P-ESH-500. At PORTS, the Emergency Management Coordinator is the emergency management program administrator. Responsibilities for the administrator and emergency response organization members are described in Sect. 14 of the PORTS Emergency Plan (PEP), and the requirements are implemented by procedure SPP H-6.
2. Hazard analyses have been performed, and hazards have been identified and documented. (PGDP-PEMP, Sect. 2.0; PORTS-PEP, Sect. 6). Hazard analyses and impact analyses were performed for each facility using various available technical documents and reports. Emergency Action Levels are in place for the spectrum of emergencies identified in the hazard analyses. These EALs are described in the respective plant documents (PGDP-PEMP, Sect. 3, SPP P-ESH-500 series; PORTS-PEP, Sect. 7, SPP H-6).
3. At PGDP, the PEMP is the controlled document which describes the emergency management program. Plant emergency procedures which implement the program are in the SPP P-ESH-5XX Series. At PORTS, the PEP is the controlled document which describes the emergency management program. Plant emergency procedures which implement the program are in the associated appendices to the PEP.
4. Interface and coordination with federal, state and local agencies and organizations responsible for off-site response and protection of the public are in place (PGDP-PEMP, Sect. 3, App B; PORTS-PEP, Sect. 3, App B). Both sites maintain Memoranda of Understanding and Letters of Agreement which implement the requirements of the respective emergency plans.
5. Procedures for prompt notification of emergency response personnel and response organizations, including federal, state, and local organizations and for continuing communications among the various organizations are in place and described in the respective plant documents (PGDP-PEMP, Sect.3, P-ESH-505; PORTS-PEP, Sect. 5, and Appendix D).
6. Emergency response activities are coordinated with local, state, and federal officials through the use of continued communications during the event (PGDP, P-ESH-5XX Series; PORTS; PEP).
7. Emergency facilities, equipment, and materials necessary to adequately support emergency response activities are in place and described in the respective plant documents (PGDP PEMP; PORTS-PEP, Sect. 11).
8. Permanent EOCs have been established at each GDP. Alternate locations have also been established.

9. The capability for assessing the potential consequences of an emergency is in place. The details are described in the respective plant documents (PGDP-PEMP, Sect. 3, SPP P-ESH-505; PORTS, PEP, Sect. 6).
10. Logs of emergency response actions are maintained (PGDP KY/H-143: PORTS; PEP).
11. Resources for medical support provided to injured individuals, including those with radiological or hazardous material injuries, are in place. The specific arrangements are described in the respective plant documents (PGDP-PEMP, Sect. 4, SPP P-ESH 503, 511; PORTS PEP, Sect. 8, SPP H-6).
12. Procedures and criteria for recovery from an emergency and reentry into an affected facility are in place. The specific arrangements are described in the respective plant documents (PGDP- PEMP, Sect. 3, SPP P-ESH 519; PORTS-PEP Sect. 9, SPP S-30).
13. The emergency public information program is in place. The specific details are described in the respective plant documents (PGDP PEMP, Sect. 3, P-ESH-518).
14. Emergency response training programs for instruction and qualification of all emergency response personnel are in place for each facility. The specific details are described in the respective plant documents (PGDP- PEMP, Sect. 3, SPP P-ESH 521; PORTS-PEP Sect. 12).
15. The coordinated emergency drill and exercise program is in place at both facilities. The specific details are described in the respective plant documents (PGDP- PEMP, Sect. 3, SPP P-ESH 521; PORTS-PEP Sect. 13, Proc 923-P-014).

3.13.4 Status of Conformance

The requirements set forth in Section 3.13.2 are met as described in Section 3.13.3.

3.14 PACKAGING AND TRANSPORTING NUCLEAR MATERIALS

3.14.1 Basic Objective

The GDPs Packaging and Transportation Safety Program shall ensure that packaging and transportation activities for radioactive materials are conducted in accordance with applicable regulations to protect public health and safety.

3.14.2 Implementation Requirements

1. The shipper shall prepare proper shipping papers and shall appropriately package, label, and placard each shipment of radioactive material (DOE Order 1540.1A).
2. A Safety Analysis Report for Packaging (SARP) shall be prepared in the format specified by U.S. NRC Regulatory Guide 7.9 to support the issuance or renewal of a certificate of compliance (CoC), which permits a package to be used for shipment of quantities of fissile radioactive materials and materials exceeding the A_1/A_2 quantities, as defined in DOE and NRC regulations (DOE Order 1540.2).
3. Type A packaging, which may be used to ship quantities of radioactive materials less than the A_1/A_2 quantities as defined in DOE and NRC regulations, shall meet the design and structural standards in 49 CFR 173, Subpart I (DOE Order 1540.2, DOE Order 5480.3).

4. Type A packaging used to ship fissile materials shall be (1) designed, fabricated, inspected, tested, and marked in accordance with American National Standard N14.1; specifications for Class DOT-106A; or appropriate parts of the ASME Code (depending upon the manufacture date) and (2) evaluated against the requirements in 49 CFR 173 Subpart I and in 10 CFR 71 (DOE Order 1540.2, DOE Order 5480.3).
5. A Quality Assurance Program shall be established to assure that packaging for radioactive material is fabricated, maintained, and used in accordance with the applicable regulatory requirements and approved design features.
6. Before using a package, for shipment of radioactive or fissile materials, the shipper shall ascertain that the package satisfies specific inspection criteria (DOE Order 1540.2, DOE Order 5480.3).
7. The shipper shall maintain records of each shipment of fissile material for 2 years or more (DOE Order 5480.3).
8. Workers, involved in transportation and packaging of radioactive materials, who qualify as "hazardous material workers" under DOT regulations shall be provided with the training required by those regulations (DOE Order 1540.1A).

3.14.3 How Requirements Are Met

1. The GDPs prepare shipping papers and packaging, labeling, and placarding for shipments of radioactive material. In addition PORTS uses an extract from the regulations to identify the requirements that must be met in preparing various types of fissile materials for shipment.
2. The only package currently undergoing recertification review is the PGDP Tiger Overpack for Model 48X 10-ton UF₆ cylinders used to transport UF₆ enriched to between 1 and 4.5 wt % ²³⁵U. The SARP for the PGDP Tiger Overpack, SARP KY-773, Revision 8, has been prepared in the format specified by U.S. NRC Regulatory Guide 7.9 and has been submitted to DOE for renewal of CoC USA/6553/AF, which expired on May 31, 1993. The NRC CoC expires on September 30, 1993. DOE is currently reviewing the SARP and the use of the package is being continued during the DOE review period.
3. Compliance with the structural standards for Type A packaging is achieved through use of Type A packages for which documentation that demonstrates compliance is known to exist.
4. Use of Type A packages to ship fissile material is limited to those packages for which documentation is known to exist that demonstrates that they have been: (1) designed, fabricated, inspected, tested, and marked in accordance with American National Standard N14.1; specifications for Class DOT-106A; or appropriate parts of the ASME Code (depending upon the manufacture date) and (2) evaluated against the requirements in 49 CFR 173 Subpart I and in 10 CFR 71.
5. The quality assurance program requirements for specific types of packages are documented in the SARP for the package type. These requirements for each type of package are met through the implementation of GDP site protocols for required inspection, maintenance, testing, and procurement of; control of design modifications to; and maintenance of records concerning; the specific package type.
6. Inspections are conducted prior to shipping radioactive material in specific packages to verify that the packages meet applicable regulatory requirements, SARP commitments, industry standards and site operating protocols.

7. Shipping records are maintained in accordance with 49 CFR 173.415 for DOT Specification 7A Type A packages and in accordance with SARP KY-773 quality assurance record retention requirements, which are taken from 10 CFR 71.19 for the PGDP Tiger Overpack.
8. Workers, involved in transportation and packaging of radioactive materials, who qualify as "hazardous material workers" under DOT regulations are trained in accordance with those regulations.

3.14.4 Status of Conformance

The requirements set forth in Section 3.14.2 are met as described in Section 3.14.3.

3.15 SAMPLING AND ANALYSIS

3.15.1 Basic Objective

Sampling and analysis for the radiation protection of employees and the public and for safeguards purposes shall be conducted in such a way as to provide representative, defensible data.

3.15.2 Implementation Requirements

1. All sampling and analysis activities shall be performed in accordance with documented and approved procedures which describe in detail the quality measures for that activity (DOE Order 5400.1, DOE Order 5480.10, and DOE Order 5633.3A).
 - Sampling shall be conducted in such a manner as to ensure collection of representative samples, and precautions shall be taken to maintain sample integrity.
 - Sample chains of custody shall be maintained for occupational health and environmental protection samples.
 - The frequency and types of QC samples, including replicate samples, shall be defined in controlled documents and procedures.
 - A formal program to control standards and reagents shall be implemented.
 - The reliability of the sampling technique shall be commensurate with the significance of the sample to safety and safeguards.
2. A sampling and analysis control program for assuring that equipment used to measure nuclear material is properly calibrated with standards traceable to NIST, where available, shall be established (DOE Order 5633.3A).
 - An instrument control program, including such requirements as preventative maintenance, efficiency, and functional and background checks, shall be established and maintained.
 - Logs of instrument usage shall be maintained.
3. Formal sampling and analysis programs shall be developed for the following:
 - Nuclear Materials Control and Accountability (DOE Order 5633.3A),
 - Radioactive and Air Contaminants (DOE Order 5480.11, DOE Order 5480.8A),

- Soils (DOE Order 5400.5, DOE Order 5400.1),
 - Occupational and Environmental Health (DOE Order 5483.1B, DOE Order 5480.11, DOE Order 5400.5), and
 - Surface Contamination Monitoring (DOE Order 5480.11, DOE Order 5400.5).
4. Laboratories shall be certified or accredited, as appropriate, with federal, state, and local agencies or professional societies (such as AIHA). (DOE Order 5400.1).
 5. Laboratories shall participate in measurement control and performance evaluation programs. (DOE Order 5400.1 and DOE Order 5633.3A).
 6. Samples that could potentially be contaminated with radionuclides shall be shipped to DOE or NRC licensed laboratories for analysis.

3.15.3 How Requirements Are Met

1. Sampling and analysis is performed in accordance with documented approved procedures or "Standard Methods."
 - The requirements, responsibilities, and actions used to implement a sound safeguards sampling and analysis program are outlined in specific NMC&A Plans and Procedures. Nuclear Material (NM) sampling methods used at GDPs are tailored to the material matrix to be sampled and to the type of analyses to be performed (PGDP KY/D-3899, *Environmental Monitoring Department Procedures Manual*, and *NMC&A Procedures Manual*, Sect. 5).
 - Sampling and analysis programs for air, surface water, ground water, and soils are covered in Sect. 3.11 describing environmental protection (PGDP Technical Services Division Measure Control Program and Measurement Control Procedures).
 - Surface contamination monitoring and air monitoring for radioactive materials are covered in the section describing Radiation Protection (both plants, UE-SPP-ESH-6).
 - Chain of custody is maintained for all personnel samples (PORTS SPP R-4, IH-002).
2. The GDPs have comprehensive Measurements Control Programs which include the analysis of parameters for NMC&A, Health Physics, and Environmental Protection. These programs include instrument control programs, control of standards and reagents, the use of NIST traceable calibration sources, frequency and type of quality control samples, instrument logs, etc.
 - Both site laboratories also participate in Measurements Control Programs internal to the plant.
 - Included in these programs are qualification programs for analysts and sampling personnel who perform job duties related to NMC&A activities, blind and double blind control sample programs, as well as QA/QC activities initiated by each laboratory group.
 - Control programs include the submission of samples, evaluation of sample results against control limits, a documented investigation and response system for nonconforming results, evaluation of control data, and reporting of results to management.
3. Formal Sampling and Analysis Programs have been developed for Nuclear Materials Control and Accountability, Radioactive Air Contaminants, Bioassay and Surface Contaminants Monitoring.

These are further outlined in other sections of this chapter. Special urine samples are collected after job activities with radionuclide exposure potential. Selected workers participate in a routine urinalysis program to evaluate the effectiveness of personal protective equipment. Analysis is provided on-site with the exception that, for PGDP, transuranics are analyzed off-site. Blind urine samples are periodically submitted to the laboratory for performance checks. Analyses involved in blind controls programs include uranium, alpha, ⁹⁹Tc, fluoride, and selected metals. Employees with elevated results are resampled, investigated, or restricted from exposure activities, as appropriate. At PGDP, a voluntary 24-hour urine sampling program is conducted for selected workers exposed to transuranic elements (PGDP P-ESH-7, P-ESH-53; PORTS SPP H-34, H-43).

4. The Analytical Laboratories are AIHA-accredited laboratories for certain procedures.
5. The laboratories participate in several performance evaluation programs, including the PAT Program administered for the NIOSH by the AIHA; the EML Program, administered by DOE; the EPA EMSL-LV Intercomparison Studies Program; the EPA DMR-QA Study; and the PET Program, a commercial A2LA-registered quality program administered by the Analytical Products Group of Belpre, Ohio. In addition, the PORTS participates in EPA's Water Pollution Laboratory Performance Evaluation Study and Water Supply Performance Evaluation Study and the NIST asbestos bulk materials analysis program, and PGDP participates in the Bulk Asbestos Round Robin Testing Program administered by AIHA.
6. All samples that could be potentially contaminated with radionuclides are shipped to DOE or NRC licensed laboratories for analysis. All laboratories are audited and approved. Samples are shipped in such a manner that maintains the sample integrity according to EPA regulations and guidelines. Samples are surveyed by Health Physics. Also, gross alpha and gross beta analyses are performed prior to shipping department, as required. The HP survey and radiochemical results are forwarded to Transportation and the contract laboratory (PGDP: Analytical Laboratory Department Manual). Samples are packaged in accordance with applicable requirements. The hazard class of each sample is taken into consideration when choosing the appropriately designated UN Standard package (PGDP: P-ESH-66, 67, and Traffic Section procedures).

3.15.4 Status of Conformance

The requirements set forth in Section 3.15.2 are met as described in Section 3.15.3.

3.16 WASTE MANAGEMENT PROGRAM

3.16.1 Basic Objective

Management of waste shall be conducted in accordance with applicable federal, state, and local laws and regulations. The management of radioactive and mixed waste shall be conducted in such a manner to ensure that the radioactive releases, should they occur, are below regulatory limits and ALARA.

3.16.2 Implementation Requirements

The regulatory requirements for mixed wastes (i.e., hazardous/radioactive and PCB/radioactive) are addressed in environmental law as well as under the Atomic Energy Act of 1954 as amended. The requirements under environmental law are codified in the Code of Federal Regulations of Title 40 Parts 260 through 272 in accordance with Subtitle C of the Resource Conservation and Recovery Act (RCRA). Polychlorinated biphenyls (PCBs) are governed by regulations codified in Title 40 Part 761 in accordance with the Toxic Substances Control Act (TSCA). The radioactive components for these and for all low-level radioactive wastes are subject to the following implementing requirements.

1. The safety and health of the public shall be protected by managing operations in a manner that provides for the safe handling, transportation, storage, of radioactive or mixed wastes generated. This is accomplished by managing according to the requirements of the Atomic Energy Act (AEA), and applicable state requirements (DOE Order 5400.3; DOE Order 5820.2A).
2. A Waste Minimization Program shall be in place to segregate, substitute, and minimize the amount of waste requiring disposal (DOE Order 5820.2A; DOE Order 5400.1).
3. All radioactive and mixed wastes shall be characterized with sufficient accuracy to permit segregation, handling, and transfer to treatment, storage, or disposal facilities (TSD). Additional characterization needed to ensure the actual physical, and radiological characteristics meet the waste acceptance criteria (WAC) of either a DOE or an off-site TSD facility shall be performed prior to shipment to the TSD (DOE Order 5400.3; DOE Order 5820.2A).
4. Off-site shipments of LLW and mixed waste shall be in accordance with all applicable DOT regulations and manifesting requirements (DOE Order 5400.3, DOE Order 5820.2A).
5. An operating record-keeping system shall be developed and maintained to document the following: (1) a historical record of waste generated, treated, stored, shipped, and/or disposed of; (2) data necessary to show that the waste was properly classified, treated, stored, shipped, and/or disposed of; and (3) waste manifests (DOE Order 5480.3, DOE Order 5820.2A).
6. A quality assurance program will be in place to inspect both on-site and off-site treatment storage and disposal facilities and practices (DOE Order 5700.6C).

3.16.3 How Requirements Are Met

Following July 1, for the near term, USEC will not store mixed waste on-site for greater than 90 days. DOE has agreed to store USEC mixed waste. A Memorandum of Agreement (MOA) is in place which discusses the respective roles and responsibilities between DOE and USEC. USEC's role in handling DOE's PCB/radioactive regulated waste will be confined to proper containers, labeling, and interim storage until the waste can be transferred to DOE.

1. The requirements for handling radioactive and mixed wastes are specified through a series of written policies and procedures, which are implemented in waste operations (PGDP SPP-ESH-28, PORTS SPP-R-2).
2. The waste minimization and pollution prevention programs meet the requirements of DOE Orders as well as federal and state regulations. Both sites have published waste minimization plans (PGDP SPP-ESH-45, "Waste Minimization"; PORTS SPP-R2).
3. Process knowledge and analytical data are used to ensure that TSD waste acceptance criteria and regulatory requirements are met (PGDP SPP-ESH-28, PORTS SPP-R-2).
4. Off-site shipments of LLW and mixed waste follow DOT criteria incorporated in plant level procedures and criteria discussed in Sect. 3.14, "Packaging and Transporting Nuclear Materials," of this document. The traffic departments at the GDPs are responsible for administering programs and procedures that implement these requirements. Off-site shipments of RCRA and PCB waste follow criteria established in 40 CFR 263 and 761 for RCRA and PCB wastes, respectively (PGDP SPP-ESH-28; PORTS SPP-R2).
5. A record-keeping system has been established that contains information regarding stored waste, such as container type, waste characteristics or classification, and disposal records including off-site

shipment manifests (MMES Policy ESH-14, V. Part II. B.3; PGDP SPP-ESH-28; PORTS SPP-R-2).

6. USEC will maintain an active quality assurance inspection program of its own program and of the TSD services it receives from DOE and other commercial vendors.

3.16.4 Status of Conformance

The requirements set forth in Section 3.16.2 are met as described in Section 3.16.3 with the following general exceptions:

- USEC will need to develop a program and procedures for transferring USEC-generated wastes to DOE facilities.
- Waste minimization plans are not fully implemented.

3.17 ACCIDENT ANALYSES

3.17.1 Basic Objective

A thorough evaluation of all operations shall be conducted to assure that hazards have been identified and that appropriate limits and controls exist to provide for safe operation under accident conditions. Hazards analyses, which are an integral part of safety analyses, shall examine the frequency and consequences of credible event sequences.

3.17.2 Implementation Requirements

1. Engineering analyses of each safety system and its components to determine failure modes and scenarios and consequences of failure shall be accomplished (DOE Order 5480.5, DOE Order 5480.23).
2. Each analysis shall be documented, and the documentation shall include the means used to protect against identified failure modes and effects (DOE Order 5480.5, DOE Order 5480.23).
3. The analysis shall include appropriate hazards that arise from outside the GDPs, such as natural phenomena and fire (DOE Order 5480.5, DOE Order 5480.23, and DOE 6430.1A).
4. USQDs are performed as necessary to assure that procedure, test or equipment modifications do not invalidate the results of accident analyses (DOE Order 5480.5 and DOE Order 5480.21).

3.17.3 How the Requirements Are Met

1. Safety analyses have been performed at both sites. The safety analyses are documented in the FSARs (PGDP FSAR, KY-734; PORTS FSAR, GAT/GDP-1073). Each site's FSAR is written to cover the entire plant, although under the leasing arrangement, the USEC will not lease all facilities at the plants. The OSRs (PGDP KY/S-15; PORTS GAT/GDP-1074, Parts A through L) are derived from the FSARs and provide a more concise listing of the safety limits, limiting safety system settings, surveillance requirements, administrative controls, limiting conditions of operation, and the bases for these limits. The FSARs and OSRs form the basis for operation of the facilities.
2. Safety analyses are performed on modifications and changes. The safety analysis results are documented and incorporated into the plant's OSRs and FSAR as appropriate. A listing of current

safety analysis documentation is maintained. NCS evaluations are performed in accordance with the NCS requirements identified and discussed in Sect. 3.9.

3. The types of hazards and accidents evaluated in the FSARs include natural phenomena and fire.
4. A summary of representative safety analysis activity for each plant since the completion of the 1985 FSAR is presented in the Attachment of this report.

3.17.4 Status of Conformance

The requirements set forth in Section 3.17.2 are met as described in Section 3.17.3 with the following general exceptions:

- The 1985 FSARs do not fully reflect the current plant configuration.
- A comprehensive revision and updating of the FSAR has not been accomplished.

3.18 SECURITY

3.18.1 Basic Objective

A documented program shall be implemented to protect DOE security interests other than SNM, including classified information and material and sensitive unclassified information and material.

3.18.2 Implementation Requirements

The program for protecting DOE security interests other than SNM shall include the following elements:

1. Measures to ensure effective management and implementation of the security program, including the following:
 - a. a documented security program providing the level of protection mandated by DOE Orders (DOE Orders 5630.11A and 5632.1B);
 - b. security program planning activities providing the level of protection mandated by DOE Orders (DOE Order 5630.14A);
 - c. a security training program providing the level of protection mandated by DOE Orders (DOE Order 5630.15);
 - d. a protective force, providing the level of protection mandated by DOE Order 5632.7, the armed members of which are trained and qualified under a program providing the level of protection mandated by DOE Orders (DOE Orders 5632.7 and 5632.7.1);
 - e. measures to control the issuance and use of security badges, credentials, and shields, providing the level of control mandated by DOE Order 5632.9A;
 - f. a program of security-system performance testing, providing the level of assurance of security program effectiveness mandated by DOE Orders (DOE Orders 5630.16 and 5632.8); and

- e. measures to control and protect UCNI, providing the level of protection mandated by DOE Orders (DOE Order 5635.4);
- f. an unclassified computer security program, providing the level of protection mandated by DOE Orders (DOE Order 1360.2B); and
- g. a program to control unclassified visits and assignments by foreign nationals, providing the level of protection mandated by DOE Orders (DOE Order 1240.2B).

3.18.3 How Requirements Are Met

Described in the site Safeguards and Security Plans are measures employed by the GDPs to ensure the following:

- (a) effective management and implementation of the security program,
- (b) protection of classified information and materials from loss or unauthorized disclosure, and
- (c) protection of sensitive unclassified information and materials from loss or unauthorized disclosure.

3.18.4 Status of Conformance

The requirements presented in Sect. 3.18.2 are satisfied as described in Sect. 3.18.3.

3.19 CHEMICAL SAFETY

3.19.1 Basic Objective

Chemical safety practices shall be such as (1) to prevent or minimize chemical releases potentially leading to the release of radioactive materials or increase radiation exposures in the work environment or offsite.

3.19.2 Implementation Requirements

Chemical safety programs shall be established and implemented to:

1. Ensure that the levels of air contaminants within the plant are less than established standards of OSHA (DOE Order 5483.1B).
2. Provide for the adequate storage of chemicals and other hazardous materials (29CFR1910, ANSI/NFPA 30.321, and 395, ANSI/UL 1275).

3.19.3 How Requirements Are Met

Chemical safety programs have been implemented as described below:

1. An active program exists for monitoring various chemical contaminants (e.g., solvents, gases, heavy and other metals, dusts) usually found in conjunction with radioactive materials in workplace environments. Plant procedures are not in place at PGDP, but departmental procedures define monitoring requirements (PORTS SPP-H-7).

2. Various storage areas are found at the facilities. Examples include designated hazardous material storage areas, compressed gas storage areas, UF₆ cylinder storage yards, and miscellaneous storage areas. These areas are well identified, assigned to a responsible individual/organization, and inspected regularly by a variety of organizations to assess compliance with the appropriate standards. The responsible person for each storage area is notified of any nonconformances and initiates needed corrective actions. Findings are tracked in an existing data base from inspection to abatement. Compensatory measures are provided for high and medium risk nonconformances that cannot be abated in the near term (PORTS SPP-H-22).

3.19.4 Status of Conformance

The requirements set forth in Section 3.19.3 are met as described in Section 3.19.4 with the following general exceptions:

- Deficiencies exist at both plants with respect to the content of implementing procedures and record keeping programs.
- Procedures and technical basis documents need to be completed to support the design of the workplace air monitoring program at PGDP.

EXHIBIT F

MEMORANDUM OF AGREEMENT

between

UNITED STATES DEPARTMENT OF ENERGY

and

UNITED STATES ENRICHMENT CORPORATION

for

SERVICES

July 1, 1993

MEMORANDUM OF AGREEMENT

between
UNITED STATES DEPARTMENT OF ENERGY
and
UNITED STATES ENRICHMENT CORPORATION
for the
SUPPLY OF SERVICES

THIS AGREEMENT ("MOA"), entered into as of this 1st day of July, 1993, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), represented by the SECRETARY OF ENERGY (hereinafter referred to as the "Secretary"), the statutory head of the DEPARTMENT OF ENERGY (hereinafter referred to as "DOE"), and the UNITED STATES ENRICHMENT CORPORATION (hereinafter referred to as "USEC");

WITNESSETH THAT:

WHEREAS, DOE and USEC have entered into a Lease, effective July 1, 1993 ("Lease"), whereby USEC is leasing certain uranium enrichment facilities at the Portsmouth Gaseous Diffusion Plant and the Paducah Gaseous Diffusion Plant ("GDPs"); and

WHEREAS, DOE will provide certain services in support of the USEC and USEC will provide certain services in support of DOE at the GDPs;

NOW, THEREFORE, the parties hereto agree as follows:

ARTICLE I - DEFINITIONS

Unless defined herein, terms used in this MOA shall have the meaning given to them in the Lease.

ARTICLE II - PURPOSES OF MEMORANDUM OF AGREEMENT

The general purposes of this MOA are:

To enable DOE to provide to USEC certain services at the GDPs and to enable USEC to provide to DOE certain services at the GDPs.

ARTICLE III - SERVICES TO BE PROVIDED

1. At USEC's request, DOE agrees to make available to USEC the services set forth in Appendix A.
2. At DOE's request, USEC agrees to make available to DOE the services set forth in Appendix B.

3. Services shall be requested for six month periods based upon each party's best estimate of its requirements. The first such request shall be made on July 1, 1993. Subsequent requests shall be made for successive six month periods beginning January 1, 1994. Such requests shall be made on the November 1 and May 1 prior to the beginning of a six month period. Either party may alter its requirements downward or upward to include an additional 10% of the estimated amount; provided, however, that any reduction in services which results in a reduction in workforce shall require 90 days prior notice.

ARTICLE IV - CHARGES

A. Charges for Services

The following charges shall apply for the services provided in Appendix A and Appendix B except for electric power delivered to DOE by USEC identified in Appendix B:

1. The charges to be paid for each service shall be agreed to and specified in a separate agreement. For the initial period July 1, 1993, to December 31, 1993, such charges shall be exclusive of depreciation, Federal Headquarters and Field charges, and profit. The charges shall be reviewed prior to December 31, 1993, and annually thereafter, to determine whether such charges are fair and equitable to the USEC and DOE and whether the charges should be adjusted.
2. Billings will be based on actual services rendered on a monthly basis; provided, however, that each party shall pay for 100% of the services estimated for the six month period, unless otherwise mutually agreed. If actual services rendered are less than the agreed upon estimate of services, a payment shall be made in the month following the end of a six-month period which reconciles the difference.

B. Charges for Electric Power

The following charges shall apply to the delivery of electric power from USEC to DOE identified in Appendix B:

DOE shall pay its pro rata share of all charges, rates, and liabilities associated with DOE's right under this MOA to receive electric power for its own use on or after July 1, 1993. DOE and USEC will agree no later than September 30, 1993, upon

procedures for calculating DOE's electric power use; provided, however, that until such time, USEC shall bill DOE \$90,000 per month for electric power use. When the parties have agreed upon procedures for calculating DOE's electric power use, USEC will adjust DOE's bill retroactively to July 1, 1993, based upon that agreement.

ARTICLE V - BILLINGS AND PAYMENT

1. On July 1, 1993, USEC will make a payment to DOE for the services it estimates it will require in the first 45 days. Upon receipt of invoices for services rendered, USEC shall promptly remit payments to assure a sufficient budgetary resource continues to be available.
2. On July 1, 1993, DOE will make a payment to USEC for the services it estimates it will require in the first 45 days. Upon receipt of invoices for services rendered, DOE shall promptly remit payments to assure a sufficient budgetary resource continues to be available.
3. Amounts due DOE shall be payable to the Department of Energy and shall be sent to the address specified on the bill. Amounts due USEC shall be payable to the United States Enrichment Corporation and shall be sent to the address specified on the bill. Either party may, by notice given the other, change the payee designation herein.

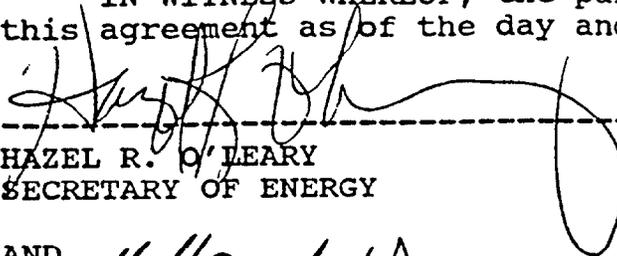
ARTICLE VI - FUNDING FOR PAYMENTS TO OTHERS

USEC shall provide funding for the payment of accounts payable and payroll processed by the DOE for the USEC. On each day accounts payable will be totaled and the totaled amount wire transferred to DOE's account in the Treasury Department. Each week payroll will be totaled and the totaled amount wire transferred to DOE's account in the Treasury Department.

ARTICLE VII - PRIORITY OF SERVICES

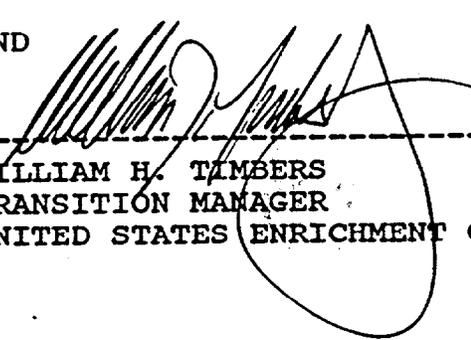
USEC and DOE agree to perform for each other on a priority basis any and all services required for compliance with applicable federal, state and local regulations.

IN WITNESS WHEREOF, the parties hereto have executed
this agreement as of the day and year first above written.



HAZEL R. O'LEARY
SECRETARY OF ENERGY

AND



WILLIAM H. TIMBERS
TRANSITION MANAGER
UNITED STATES ENRICHMENT CORPORATION

APPENDIX A TO EXHIBIT F

**SERVICES TO BE PROVIDED BY
THE DEPARTMENT OF ENERGY**

EXHIBIT D

REGULATORY OVERSIGHT AGREEMENT

between

UNITED STATES DEPARTMENT OF ENERGY

and

UNITED STATES ENRICHMENT CORPORATION

July 1, 1993

REGULATORY OVERSIGHT AGREEMENT

between

UNITED STATES DEPARTMENT OF ENERGY

and

UNITED STATES ENRICHMENT CORPORATION

THIS AGREEMENT, entered into as of this 1st day of July, 1993, by and between the UNITED STATES OF AMERICA (hereinafter referred to as the "Government"), represented by the SECRETARY OF ENERGY (hereinafter referred to as the "Secretary"), the statutory head of the DEPARTMENT OF ENERGY (hereinafter referred to as "DOE"), and the UNITED STATES ENRICHMENT CORPORATION (hereinafter referred to as "USEC");

WITNESSETH THAT:

WHEREAS, until the Nuclear Regulatory Commission ("NRC") issues a Certificate of Compliance to USEC or approves a Compliance Plan pursuant to Section 1701 of the Atomic Energy Act of 1954, as amended ("AEA"), the DOE is required to promote and protect the radiological health and safety of the public and workers and to provide for the common defense and security at DOE-owned facilities by exercising nuclear safety and safeguards and security oversight authority at the Leased Premises as defined in the Lease Agreement between DOE and USEC dated as of July 1, 1993 (hereinafter referred to as the "Lease");

NOW, THEREFORE, the parties hereto agree as follows:

ARTICLE I - DEFINITIONS

As used throughout this agreement, including the appendices hereto, the following terms, when capitalized, mean:

1. The term "Appraisal Team Member" means a DOE safety and health or safeguards and security professional supporting DOE Nuclear Safety and Safeguards and Security Requirements oversight activities.
2. The term "Civil Penalty" means a monetary penalty that may be imposed for violation of Nuclear Safety and Safeguards and Security Requirements.
3. The term "Clear And Present Danger" means a condition or hazard that could be expected to cause: (a) either death or serious harm to plant workers or the public, or (b) serious damage to the common defense and securi-

ty, immediately or before such condition or hazard could be eliminated through the normal enforcement mechanisms discussed in this Agreement.

4. The term "DOE ORO Manager" means the Manager of DOE Oak Ridge Operations Office or one or more DOE employee(s) whom that Manager has designated, in writing, to act for him in all, or a portion, of the matters addressed herein.
5. The term "DOE Regulatory Oversight Manager" means the DOE representative, or his designee, responsible for implementation of all facets of DOE regulatory oversight of the Leased Premises.
6. The term "Notice Of Violation" means a document setting forth the determination of the DOE Regulatory Oversight Manager that one or more violations of Nuclear Safety and Safeguards and Security Requirements has occurred.
7. The term "Nuclear Safety and Safeguards and Security Requirements" means the implementation requirements with respect to the nuclear safety, safeguards and security objectives as set forth in Chapter 3 of Appendix A to this Agreement, entitled "Safety Basis and Framework for DOE Oversight of the Gaseous Diffusion Plants."
8. The term "Violation" means a failure of the USEC or its contractor(s) to meet any of the Nuclear Safety and Safeguards and Security Requirements incorporated into this Agreement. Each failure may be considered a separate occurrence of a violation, as may each day that the same violation persists.

All other capitalized terms shall have the meaning ascribed to them elsewhere in this Agreement or the appendices hereto, or the Lease.

ARTICLE II - STATEMENT AND PURPOSE

The general purpose of this Regulatory Oversight Agreement ("Agreement") is to reflect the DOE determinations and requirements and the mutual commitments, understandings, and arrangements between the DOE and the USEC concerning the regulatory oversight of the Leased Premises by DOE with respect to Nuclear Safety and Safeguards and Security Requirements.

ARTICLE III - TERM OF AGREEMENT

The term of this Agreement shall commence on July 1, 1993, and continue until the NRC issues standards and certifies

compliance with such standards, or approves a plan, prepared by DOE, for compliance with such standards and assumes responsibility for regulatory oversight over the Leased Premises with respect to nuclear safety and safeguards and security. Such period of time during which DOE exercises regulatory oversight shall be known as the "Interim Period."

ARTICLE IV - DOE OVERSIGHT/ENFORCEMENT AUTHORITY

1. DOE has determined that the Implementation Requirements set forth in Chapter 3 of the "Safety Basis and Framework for DOE Oversight of the Gaseous Diffusion Plants" (the "Plan"), attached hereto and incorporated by reference herein as Appendix A, are reasonable and appropriate, and shall constitute the Nuclear Safety and Safeguards and Security Requirements applicable to the Leased Premises during the Interim Period, and that compliance with these Nuclear Safety and Safeguards and Security Requirements during the Interim Period will enable the Leased Premises to continue to operate safely and protect the public health and safety and provide for the common defense and security during the Interim Period.
2. DOE has determined that the comprehensive program of USEC self-assessments and DOE inspections, reviews, and other activities set forth in Chapter 4 of the Plan (the "Oversight Program") is reasonable and appropriate, and, when coupled with the USEC commitments contained herein, will provide adequate assurance that the Leased Premises will continue to comply with the Nuclear Safety and Safeguards and Security Requirements set forth in the Plan during this Interim Period. DOE and USEC further agree that, unless and until such time as DOE promulgates and implements nuclear safety regulations applicable to the USEC pursuant to the Price-Anderson Amendments of 1988, this Oversight Program will constitute the mechanism by which DOE will exercise regulatory oversight and control over the Leased Premises with respect to nuclear safety, safeguards and security during the Interim Period. In the event that DOE promulgates and implements nuclear safety regulations applicable to the USEC pursuant to the Price-Anderson Amendments of 1988, DOE and USEC will make appropriate revisions to the Plan.
3. DOE represents to USEC that the portions of the Plan entitled "How the Requirements Are Being Met" in Chapter 3 summarize the significant policies, procedures, practices, and other implementation measures which currently exist at the Leased Premises with respect to each of the Nuclear Safety and Safeguards and Security

Requirements in the Plan and summarize the current status of conformance of the Leased Premises with the Nuclear Safety and Safeguards and Security Requirements as set forth in the portions of Chapter 3 entitled "Status of Conformance." The applicable portions of the DOE Orders which are referenced in Chapter 3 of the Plan provide additional guidance concerning the implementation measures that would enable the Leased Premises to meet the Nuclear Safety and Safeguards and Security Requirements.

4. USEC agrees to ensure that the Leased Premises continue to comply with the Nuclear Safety and Safeguards and Security Requirements in Chapter 3 of the Plan during the Interim Period through the continuation of the policies, procedures, practices, and other implementation measures described in the Plan. USEC agrees to impose this commitment on the contractor operating the Leased Premises on behalf of USEC and include appropriate provisions in the contract for the operation of the Leased Premises to provide further assurance that USEC and the operating contractor will continue to meet this commitment. USEC further agrees, as part of the Oversight Program, to undertake the self-assessment activities described in the Plan with respect to the Nuclear Safety and Safeguards and Security Requirements; cooperate with DOE in the inspections, reviews, and other activities conducted by DOE in accordance with the Oversight Program; and implement or cause its operating contractor to implement corrective or preventive actions as a result of these assessments, inspections, reviews, and other activities.
5. A. DOE has determined that DOE's regulatory oversight of the Leased Premises during the Interim Period, including all of the self-assessments, inspections, reviews, and other activities described in the Oversight Program, will be coordinated by the DOE Regulatory Oversight Manager. The DOE Regulatory Oversight Manager will have the authority to modify the Nuclear Safety and Safeguards and Security Requirements set forth in the Plan, including the authority to make additions or deletions to these requirements, if the DOE Regulatory Oversight Manager determines that the additional requirement is necessary to protect the public health and safety or to provide for the common defense and security, or the deleted requirement is no longer necessary to protect the public health and safety or to provide for the common defense and security in connection with the operation of the Leased Premises.

- B. USEC is authorized to add to, modify, or delete ("Change") any of the policies, procedures, practices and other implementation measures described in the Plan to meet the Nuclear Safety and Safeguards and Security Requirements, provided (1) there will be no material diminution in the level of protection of the public health and safety or common defense and security as a result of such Change; (2) the Change does not involve an Unreviewed Safety Question or a Change in the Authorization Basis or an Operational Safety Requirement; (3) auditable records containing a summary of the Changes performed and retrievable evaluation packages required by the DOE requirements specified in Chapter 3 are maintained; and (4) a summary of the Changes is made available to DOE annually for review and concurrence.
 - C. For proposed Changes which involve an Unreviewed Safety Question or a Change in the Authorization Basis or an Operational Safety Requirement, as these terms are defined in DOE Order 5480.21, USEC shall obtain DOE review and approval before implementing the proposed Change.
 - D. In reviewing the proposed modification of any specific Nuclear Safety and Safeguards and Security Requirement or implementation measure, the DOE Regulatory Oversight Manager will, whenever possible, attempt to facilitate the transition to compliance with the regulatory standards and requirements likely to be imposed on the Leased Premises by the NRC at the conclusion of the Interim Period.
6. The enforcement procedures available to DOE in the event that the USEC fails to comply with the Nuclear Safety and Safeguards and Security Requirements are attached hereto, and incorporated by reference herein as Appendix B.

ARTICLE V - NOTICES

With the exception of Shutdown authority (as described in Appendix B of this Agreement) invoked by the DOE Regulatory Oversight Manager pursuant to Appendix B, no notice, Notice Of Violation, answer, order, determination, requirement, consent, or approval under this Agreement shall be of any effect unless in writing. All notices and communications pursuant to this agreement required or desired to be given by DOE or the USEC to

either party shall be addressed to the USEC or to the DOE and sent to the following addresses:

To DOE: James C. Hall
Assistant Manager for Enriching Operations
U. S. Department of Energy
Oak Ridge Operations
P. O. Box 2001
Oak Ridge, Tennessee 37831

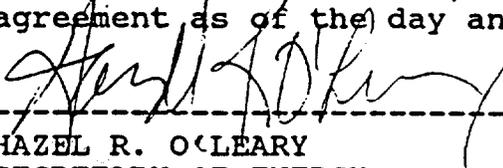
To USEC: General Counsel
United States Enrichment Corporation
2300 M Street, N. W.
Washington, D. C. 20037

Either party may, by notice given as aforesaid, change its address for notices and communications to be given thereafter.

ARTICLE VI - DOE PLAN UNDER SECTION 1701

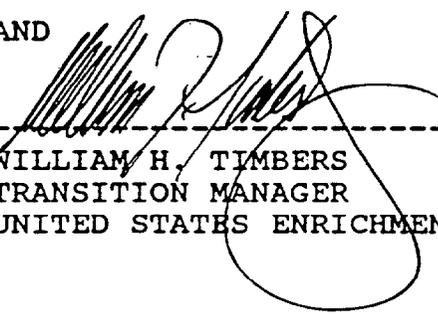
The USEC will submit to DOE an initial draft of a plan for DOE's consideration in meeting DOE's obligation to prepare a plan under Section 1701(d) of the AEA for achieving compliance by the Leased Premises with the rules, regulations, and standards of the NRC. DOE shall consult with USEC during the preparation of DOE's plan and any subsequent revision thereof. DOE and USEC will use their best efforts to agree on a DOE plan prior to its submittal for approval by the NRC and any subsequent submittals to NRC related to the plan.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the day and year first above written.



HAZEL R. O'LEARY
SECRETARY OF ENERGY

AND



WILLIAM H. TIMBERS
TRANSITION MANAGER
UNITED STATES ENRICHMENT CORPORATION

APPENDIX A

Services to be provided by DOE

DOE agrees to perform the services set forth below at the costs to be negotiated for each respective group of services.

1. Compliance, Evaluations and Policy Services

Environmental Compliance - RCRA Program, Pollution Prevention, Rad Waste Management, CAA, CWA, and TSCA.

Health and Safety - Hazardous Materials Management Information System, Occupational Health Information System, and Rad Protection Program

Quality Assurance - Technical Audits, Qualified Suppliers List, Special Investigations, and Lessons Learned System.

Evaluations - Performance Evaluation and Training Support.

Medical - Services.

Policy and Management Systems - Publication and control of ES procedures and compliance management.

2. Business Management

Controller - Accounts payable, payroll, and cost reporting for Paducah and MMUS Oak Ridge activities.

Treasurer - Benefits Administration services are available so long as MMUS benefits (both pension and postretirement benefits) are consistent with the MMES Oak Ridge plan.

Contracts - Property including lease administration, DOE Orders, and Contract Administration.

Business Systems - Support of new Cost Accounting System, Material Management System, Distribution of Personnel Data Support Cost.

Information Resources - Graphics, Corporate Records, Publications, and Acquisitions.

Procurement - Policy Procedures, Commodities Expert Buyer Services, Socioeconomic Program.

Records Management - Maintenance, processing, transferring and storage.

3. Other Central Services

Auditing - Assistance to IPA and CPA firms, allowability of cost audits, Risk-based assessments audits, follow-up on hotline and ethics issues.

General Counsel - MMES/MMUS legal support.

Safeguards and Security - Central Training, Emergency Management Evaluations, Computing and Telecommunications Support, NMC&A Coordination, Technical Surveillance Countermeasures/Operation Security Support.

Human Resources - Compensation Support, EEO Support, Central Employment Support, Labor and Benefits Support, Training Support.

4. Technical Operations Services

Engineering - Policies and Procedures, Project Design Support, Technical Support by Discipline Specialists, Design Oversight, Project Management Consultation.

Computing and Telecommunications - Financial Systems, Human Resources Systems, Operations Systems, Safety and Health Systems, Marketing and Customer Service Systems, General User Systems, and Telecommunications System.

5. K-25 Services - TSCA Incinerator, UE Personnel Support, Central Waste Management Support, Analytical Lab Sampling, Equipment Removal

6. ORNL

Nuclear Power Energy Analysis
Well Sampling
AVLIS Support
Gas Cooler Heat Transfer
Plume Studies
Other Technical Studies

7. Y-12

Dosimeter Support
NMMSS

APPENDIX B TO EXHIBIT F

**SERVICES TO BE PROVIDED BY THE
UNITED STATES ENRICHMENT CORPORATION**

APPENDIX B

Services to be provided by USEC

USEC agrees to perform the services set forth below at the costs to be negotiated for each respective service.

1. Maintenance - At DOE's request, perform maintenance on DOE facilities.
2. Garage - Provide repair and maintenance services on DOE vehicles.
3. Janitorial - Provide janitorial services for DOE facilities.
4. Analytical Laboratories - Manage the analytical laboratories and provide analytical services to DOE as required for environmental restoration activities.
5. Fire Protection - Manage the Fire Protection Program at Paducah and Portsmouth and provide fire protection to DOE facilities.
6. Plant Protection and Security Program Administration - Manage the Protective Forces and Security Program at Paducah and Portsmouth and provide services to ensure the minimum level of protection for DOE security interests, as contained in the DOE Orders 5600 series.
7. Emergency Management - Manage and provide the emergency management support systems, including emergency facilities and equipment, emergency response organization, emergency operations center, radiation/criticality accident alarm system, meteorological monitoring system, emergency communication systems, emergency notification system, and emergency notification and reporting.
8. Utilities - Provide utility services, including water, steam, air and electricity (excluding electric power for the gaseous diffusion process).
9. Nuclear Materials Control and Accountability - Provide all nuclear materials control and accountability functions required for the nuclear materials belonging to DOE and remaining, stored, processed or handled at Paducah and Portsmouth. All program elements shall be administered according to the appropriate DOE Orders.

10. Engineering/Facilities Management - Project Management Consultation.
11. Financial - Perform payroll and accounts payable services for DOE personnel and activities onsite. Prepare the Financial Information System reporting for DOE activities and perform the yearend financial close-out reporting and analyses.
12. Computer Services - Manage and provide computing services as requested.
13. Telecommunications - Provide telecommunications systems support and services.
14. Real Property and Inventory System (RPIS)/Property Management -
15. Cylinder Handling - Provide inspection, testing, re-stacking and maintenance of DOE cylinders as needed.
16. Cafeteria - Manage cafeteria services at Paducah and Portsmouth.
17. Medical - Provide medical services for all employees at Paducah and Portsmouth.
18. Stores - Maintenance and management of inventories.
19. Human Resources - Information management of personnel documents and files.
20. Procurement - Purchasing services.
21. Legal - Analysis and consultation support.
22. Logistics Support - Transportation and site management.
23. Quality Assurance - Technical Audits and Special Investigations.
24. Information Services - Graphics, Publications, and Data Retrieval.
25. Environmental Base - Air, water, and soil monitoring; studies, tests and analyses.
26. Safety and Health - Health Physics Monitoring, Industrial Hygiene, Radiation Protection, Safety and Health Systems.

27. **Records Management - Maintenance, processing, transferring and storage.**