REPORT TO CONGRESS
ON THE
GASEOUS DIFFUSION PLANTS
LOCATED NEAR
PADUCAH, KY AND PORTSMOUTH, OH

(COVERING THE PERIOD FROM OCTOBER 1, 1997, TO SEPTEMBER 30, 1998)

EXECUTIVE SUMMARY

This report is being provided to Congress as required by Section 1701 of the Atomic Energy Act (AEA). This is the second such report to be issued. It covers the period from October 1, 1997, to September 30, 1998. Information reported herein is as of September 30, 1998, unless otherwise specified. The first report, covering the period from March 3, 1997, to September 30, 1997, was sent to the Congressional oversight committees on January 5, 1998. As directed by the AEA, the U. S. Department of Energy (DOE) and the U. S. Environmental Protection Agency have been consulted regarding this report. DOE continues to be responsible for regulatory oversight of portions of both plants.

A major regulatory activity for this period was the privatization of the United States Enrichment Corporation (USEC). The Commission gave its consent for transfer of the Certificates of Compliance to the privatized entity to occur after concluding that the resulting private corporation would meet all applicable U. S. Nuclear Regulatory Commission (NRC) regulatory requirements. Such requirements include those derived from the National Industrial Security Program regarding restricting foreign involvement in entities that require access to classified information and the USEC Privatization Act regarding foreign ownership, control, and domination; common defense and security; and the maintenance of a reliable and economical source of domestic enrichment services.

During this period, the Paducah and Portsmouth gaseous diffusion plants (GDPs) have provided adequate protection of the public health and safety, safeguards, security, and the environment and have generally operated in compliance with NRC regulatory requirements. Offsite radiological doses, as well as doses to the workers, are very low, and well within regulatory limits. There have been no events, at either site, requiring activation of the emergency response centers or involving a significant release of radioactive material.

Conditions at the GDPs at Paducah and Portsmouth are generally in compliance with NRC regulations. Exceptions are described in Compliance Plans, provided for by the AEA and approved by NRC, which document binding commitments for actions and schedules to achieve full compliance. Progress has been made in completing issues in the Compliance Plans during this period, thereby bringing the plants closer to full compliance with NRC regulations than they were at the time of initial certification in November 1996. However, USEC is assessing the adequacy of completion of certain Portsmouth Compliance Plan issues and may need to readdress some issues previously considered complete. In addition, USEC has indicated that seismic modifications required by the Paducah Compliance Plan cannot be completed by the current due date of June 30, 1999. The NRC understands that USEC will propose another date for completion of the necessary seismic modifications. For those instances where, during the normal course of operation, violations of NRC regulations occurred, USEC generally took actions to reestablish compliance and developed plans to prevent recurrence.

CONTENTS

CHAPTER 1

BACKGROUND

ENERGY POLICY ACT

In October 1992, Congress enacted the Energy Policy Act (EPAct) of 1992, which amended the Atomic Energy Act of 1954 (AEA), to create the United States Enrichment Corporation (USEC)[1]. Provisions of the AEA direct the U.S. Department of Energy (DOE) to lease the gaseous diffusion plants (GDPs) near Piketon, Ohio, and Paducah, Kentucky, to USEC. These GDPs produce enriched uranium (EU), and the AEA specifies that USEC operate the GDPs efficiently and market EU on a profitable basis. Although the AEA established USEC as a government corporation, the AEA also required that within 2 years after the transition date of July 1, 1993, USEC prepare a plan for transferring ownership of USEC to private investors. In the *Lease Agreement Between The United States Department of Energy and The United States Enrichment Corporation* (Lease) dated July 1, 1993, and in other subsequent agreements, DOE and USEC established the roles and responsibilities for each organization at both GDPs. The AEA also requires the U. S. Nuclear Regulatory Commission (NRC), in consultation with DOE and the Environmental Protection Agency (EPA), to report to Congress on the status of health, safety, and environmental (HS&E) conditions at the gaseous diffusion uranium enrichment facilities. This report is the second report. It encompasses the period from October 1, 1997, through September 30, 1998.

The AEA assigns safety, safeguards, and security regulatory responsibility at the USEC-operated GDPs to NRC. Further, the AEA required that within 2 years of the date of the passage of the EPAct NRC establish, by regulation, both: (1) safety, safeguards and security standards for the GDPs; and (2) a certification process to ensure that USEC complies with these standards. This certification process is in lieu of any requirement for a license. Thus, the AEA made NRC regulation of the GDPs conditional on the issuance of new regulations, which were to be promulgated by October 1994. In accordance with these requirements, NRC promulgated Title 10 of the *U.S. Code of Federal Regulations*, Part 76 (10 CFR Part 76), "Certification of Gaseous Diffusion Plants," in September 1994.

The EPAct changes to the AEA made provision for the possibility that USEC might not initially be able to comply with the safety, safeguards, and security standards established by NRC. To address this contingency, the AEA permitted NRC to approve continued USEC operation of the GDPs if NRC approved DOE-prepared plans for bringing the GDPs into compliance with any unsatisfied provisions of NRC regulations. On November 26, 1996, NRC issued Certificates of Compliance certifying USEC's operation of the GDPs in accordance with 10 CFR Part 76 and approved a Compliance Plan for each GDP for achieving

---

[1] A listing of abbreviations and acronyms can be found in Appendix A.

compliance with NRC regulations for those areas not in full compliance. After an interim period allowing for USEC to transition to NRC regulation in an orderly manner, NRC began regulatory oversight of USEC operations on March 3, 1997. NRC has continued regulatory oversight of USEC operation of the GDPs for the entire period covered by this report.

NRC/DOE INTERFACE AND RESPONSIBILITIES

The AEA does not require that DOE lease the entire GDP sites to USEC. For example, those areas containing legacy material from operations under DOE and which are not required to support current enrichment activities and those areas containing significant quantities of accessible highly enriched uranium [(HEU) i.e., uranium that is enriched to 20 percent or more in uranium-235 (U^{235})] are excluded from the Lease. Consequently, DOE retains responsibility for the environmental protection, safety, safeguards, and security for those portions of the GDPs that are not leased to USEC and for those portions of the GDPs leased to USEC that contain HEU material. At Portsmouth, DOE will regulate the HEU material activities that occur in the leased areas until: all of the HEU material has been down-blended into the low enriched uranium cascade, all cylinders that contain residual HEU material are cleaned, all remaining HEU in those areas is transferred elsewhere, and the associated areas are transitioned to NRC regulation. These activities are currently projected to be completed in early 2000. At that time, all that will remain under DOE regulatory oversight will be areas within the GDP sites not leased to USEC or its successor organization. The AEA further assigns responsibility to DOE for the payment of any costs of decontamination and decommissioning, response actions, or corrective actions that are related to conditions existing before USEC leased the GDPs. With this assignment, DOE retains responsibility for environmental restoration activities and legacy[2] waste management at the GDP sites and for the operation of facilities used for the storage of DOE-owned source and special nuclear material, such as the cylinder storage yards for depleted uranium hexafluoride (DUF_6) generated before July 1993. In addition, DOE has been assigned responsibility for all DUF_6 generated up to the date of USEC's privatization (July 28, 1998).

In December 1993, NRC and DOE approved a "Joint Statement of Understanding Between the Nuclear Regulatory Commission and the Department of Energy on Implementing the Energy Policy Act Provisions on the Regulation of Gaseous Diffusion Uranium Enrichment Plants." This joint statement established the areas of responsibility between NRC and DOE. In August 1994, NRC and DOE approved an "Agreement Establishing Guidance for NRC Inspection Activities at the Paducah and Portsmouth Gaseous Diffusion Plants Between Department of Energy Regulatory Oversight Manager and Nuclear Regulatory Commission." This agreement supplemented the joint statement by defining in more detail the role of the NRC observers at the GDPs in the interim period during which DOE exercised

[2] The term "legacy" refers to items that are a carryover from the era when DOE managed the facility (e.g., legacy waste and legacy equipment).

public health and safety and common defense and security regulatory oversight of the leased GDPs. In March 1995, NRC and DOE established the "Agreement Defining Security Responsibilities at the Paducah and Portsmouth Gaseous Diffusion Plants Between the Department of Energy's Office of Safeguards and Security and the Nuclear Regulatory Commission." This agreement also supplements the joint statement by defining in greater detail the security roles and responsibilities of DOE and NRC after NRC assumption of regulatory oversight of USEC activities.

In October 1997, NRC and DOE signed a Memorandum of Understanding (MOU) entitled "Memorandum of Understanding Between the Department of Energy and the Nuclear Regulatory Commission - Cooperation Regarding the Gaseous Diffusion Plants." This MOU defines the responsibilities of DOE and NRC regarding continuing cooperation at the GDPs after NRC assumption of regulatory oversight for USEC activities. The MOU also clarifies the framework for coordination regarding issues that may involve DOE and NRC areas of responsibility. DOE remains responsible for regulatory oversight of the Portsmouth HEU refeed activities. DOE will also continue to review and, where appropriate, approve USEC-proposed modifications to the Paducah and Portsmouth Compliance Plans before their submittal to NRC for NRC final approval. In the MOU, DOE and NRC: (1) agreed to exchange information and technical support, (2) defined responsibilities for emergency response, (3) described the manner in which issues identified during an inspection by either agency would be referred to the other, and (4) defined responsibilities for coordination of activities. This MOU replaces the August 1994 "Agreement Establishing Guidance for NRC Inspection Activities at the Paducah and Portsmouth Gaseous Diffusion Plants Between Department of Energy Regulatory Oversight Manager and Nuclear Regulatory Commission."

Through these aforementioned agreements, statements, formal MOU, and other cooperative NRC/DOE efforts, the agencies have continued to coordinate activities of interest to both DOE and NRC.

CHAPTER 2

GASEOUS DIFFUSION PLANT OPERATIONS

The principal process regulated by NRC at the GDPs is the production of EU for reactor fuel. The GDPs receive uranium hexafluoride (UF_6), enrich it (i.e., process the material to increase the concentration of fissionable U^{235}), and then ship the enriched UF_6 to other fuel cycle facilities, where it is processed into fuel assemblies for use in nuclear power reactors. In the gaseous diffusion separation process, UF_6 gas passes through a material (barrier) with small pores that are large enough to permit the escape of single molecules, but are too small to permit bulk flow of the gas. The gas that emerges from the pores has a slightly higher concentration of U^{235} atoms than the gas that does not pass through the barrier. This process creates two streams of gas, one with a higher U^{235} concentration (enriched) and one with a lower concentration (depleted). Because the degree of enrichment achieved by the use of a single barrier (i.e., a single diffusion stage) is very small, the process must be repeated many times, employing a cascade of many stages to achieve the required enrichment levels. The outputs of the cascade are EU product and depleted uranium. The depleted uranium is stored at the GDPs, awaiting ultimate disposition.

The main components of a GDP are: large cylindrical vessels called diffusers that contain the barrier, compressors used to compress the gas to the pressures needed to flow through the barrier tubes and from one stage to another, electric motors to drive the compressors, heat exchangers and cooling systems for removing the heat of compression from the UF_6, piping for the stage and interstage connections, and block and control valves to adjust the gas flow. In addition to this process stage equipment, GDPs require auxiliary systems such as the UF_6 feed and withdrawal systems, an extensive electrical power distribution system, and cooling towers to dissipate the waste process heat.

The major areas of NRC oversight at the GDPs include: plant operations, nuclear criticality safety, physical protection, security of classified information, material control and accounting (MC&A), radiological controls for onsite and offsite personnel, waste management, transportation of radiological materials, maintenance and surveillance, training, and emergency preparedness. NRC is responsible for regulatory oversight of the design, operation, and maintenance of hardware (i.e., structures, systems, and components) relied on for safe operation; operational aspects involving the human element such as training, staffing, and adherence to procedures; and management organization and controls necessary to assure effective management oversight of facility operations. Management organization and controls include: internal reviews and audits, safety review committees, configuration management, records management, event investigation and reporting, and quality assurance programs. NRC also reviews and approves accident analyses and technical safety requirements (TSRs) developed by USEC. The accident analyses describe potential credible accidents and the facility response to those accidents, to demonstrate that the facility is capable of responding in

a fashion that will not jeopardize public health and safety. The TSRs define the safety envelope and operating parameters within which the facility is required to operate for safe operation. NRC assures safe operational readiness through issuance of a certificate of compliance, after a thorough review of design and operational information, and by field inspections conducted by specialists from both NRC Headquarters and the regional office having responsibility for the sites. In addition, two NRC resident inspectors are located at each GDP site. The resident inspectors perform daily inspections covering a broad range of site activities.

CHAPTER 3

STATUS OF COMPLIANCE PLAN ACTIVITIES

The AEA permits NRC to authorize operation of the GDPs in cases where the plants do not fully comply with NRC regulations, provided that DOE prepares, and NRC approves, a plan (i.e., Compliance Plan) for bringing the plants into compliance. 10 CFR 76.35 states that the application for an initial certification of compliance must include, among other things, a DOE-prepared and -approved plan, for achieving compliance with respect to any areas of noncompliance with NRC's regulations. 10 CFR 76.35 further states the plan must include a description of the areas of noncompliance, a plan of actions and schedules for achieving compliance, and a justification for continued operation with adequate safety, safeguards, and security.

Separate Compliance Plans were prepared for Paducah and Portsmouth, and approved by NRC, on November 26, 1996, as part of the initial certification activities. The Compliance Plans contain 53 and 46 issues, respectively, for Paducah and Portsmouth. Of these, 36 issues are substantially common to both Paducah and Portsmouth. The issues contained in the Plans, along with their status as reported by USEC as of September 30, 1998, are listed in Appendix B. Each issue in the Plan, which may consist of several sub-issues, contains a description of the applicable requirements, USEC's commitment to achieve compliance, a description of the noncompliance, a justification for continued operation while the issue is being resolved, and a plan of action to resolve the issue and bring the GDP into compliance, along with completion schedules.

Several types of noncompliances are discussed in the Compliance Plans. These noncompliances can be generally grouped into three types. The first type, minor issues, consists of minor noncompliances that are associated with established programs. Eight and 10 minor issues have been identified at Paducah and Portsmouth, respectively. The second type of noncompliance, equipment issues, involves the need for upgrades of safety-related equipment to meet NRC requirements. Equipment issues identified in the Compliance Plans total 18 for Paducah and 8 for Portsmouth. The third type of noncompliance, programmatic issues, involves situations in which USEC has not yet fully implemented a program necessary to meet NRC requirements. Programmatic issues identified in the Compliance Plans total 27 for Paducah and 28 for Portsmouth.

Equipment noncompliances for both Paducah and Portsmouth include the need to upgrade the autoclaves, discussed below, to provide an additional safety margin. These noncompliances also address structural upgrades to the process buildings at Paducah to provide an appropriate margin of safety against earthquakes. Programmatic noncompliances for both Paducah and Portsmouth include upgrading the GDPs' safety analysis reports (SARs) and procedures to meet NRC requirements and assuring that programs are in place to maintain the procedures consistent with current GDP operations and the authorization basis.

Two significant issues, addressed in the Compliance Plans, which are common to both Paducah and Portsmouth, are discussed in detail below:

- Safety Analysis Reports - 10 CFR Part 76 requires that the application for a certificate of compliance include a SAR that presents an assessment of potential accidents and describes the plant site and principal structures, systems, and components of the plant; the equipment and facilities that will be used to protect health and minimize danger to life; and the management controls and oversight program employed to protect the public and worker health and safety. DOE was in the process of updating the SARs for the GDPs when the EPAct was passed. These SAR updates were necessary to reflect new information and understanding about initiating events; plant configuration; expected response of structures, systems, and components; and accident analyses. However, DOE was not able to complete the revised SARs in time to include them in the applications for NRC certification. Thus, the SARs that were submitted with the certificate applications were based, in part, on the 1985 Final Safety Analysis Reports (FSARs) for the two plants and on DOE-approved safety evaluations performed after those FSARs were issued. DOE completed the update of the SARs and transmitted the revised SARs to USEC and NRC on February 14, 1997. On August 18, 1997, USEC submitted some SAR-related information to NRC, but was unable to fulfill its SAR commitments as stated in the Compliance Plans. On October 31, 1997, USEC submitted the bulk of the updated accident analysis. USEC considers the Compliance Plan issue to be complete with the submittal of the amendment request on August 18, 1997, and October 31, 1997. There may be additional changes to the accident analysis as USEC completes walk-downs of the plants to confirm that the actual configuration matches the documentation. The walk-down review of the systems, structures, and components is scheduled to be complete in 2001. As of September 30, 1998, NRC is reviewing the information submitted by USEC.

- Design Modifications to the Autoclaves - Feed material is received at the GDPs in cylinders that contain 10 to 14 tons of UF_6 in the solid state. To transfer this material to the diffusion cascade or for sampling, the cylinder must be heated to transform the UF_6 from a solid to a gas. When in a gaseous state, the UF_6 flows from the cylinders to feed headers, which deliver the gaseous feed material to the appropriate assay points in the diffusion cascade. Heating of the cylinders and removal of the UF_6 are performed in an autoclave. An autoclave is essentially a cylindrical vessel with an internal diameter of approximately 1.83 meters (6 feet) in which the entire UF_6 cylinder is placed and heated. The autoclave vessels and all penetrations out to the isolation valves provide containment for the remote possibility of a UF_6 release while the UF_6 is being heated and transferred. NRC has determined that autoclave design improvements are needed. These improvements include the ability to test the containment valves, replacing all containment valves that are not fail-safe, and providing adequate operator alarms. Although these design improvements will enhance the assurance of safety, the current autoclave design, in conjunction with compensatory

measures imposed by NRC, is sufficient to provide adequate assurance of safe operation until the autoclave upgrades are completed. This item was completed for the Paducah plant during the review period. For Portsmouth, this issue is scheduled for completion in early 2001.

Recent NRC inspections at Portsmouth, as well as USEC internal audits, have revealed that some Compliance Plan issues have been inadequately completed by USEC. Examples include the failure to update all of the Portsmouth building and area emergency packets to include the information required by the Compliance Plan and a failure to fully implement the issues related to the nuclear criticality safety program. A corrective action program is in place to address the problems with the nuclear criticality safety program. Both NRC and USEC are continuing to assess any underlying safety issues that may exist as a consequence of these findings. By letter dated October 9, 1998, USEC informed NRC that it plans to conduct a review of most of the Compliance Plan items at Portsmouth to determine whether items were adequately completed. Based on NRC inspection and the USEC review, some of the issues may need to be readdressed with a new completion date established. NRC is continuing to pursue this matter with USEC to ensure that all Compliance Plan issues are adequately completed and closed. USEC has received a Notice of Violation related to completion of the Portsmouth Compliance Plan issues. The following discussions on the status of the Paducah and Portsmouth Compliance Plans do not reflect issues that may need to be reopened due to inadequate completion by USEC. Compliance Plan status may be revised as a result of the USEC review of the basis and documentation supporting Compliance Plan issue completion.

STATUS OF PADUCAH COMPLIANCE PLAN

Of the 53 issues listed in the Paducah Compliance Plan, 49 have been completed (i.e., USEC has informed NRC that it has fulfilled all the individual actions described in a Compliance Plan issue). Of the 49 issues that USEC has indicated are complete, 15 issues were completed by USEC between October 1, 1997, and September 30, 1998, the close of the reporting period. The fifteen issues, along with a description of the corrective actions, follow:

- Update the Application Safety Analysis Report - USEC submitted an amendment request to revise the SAR to reflect the updated information, including the revised accident analysis and technical safety requirements.

- Autoclave Upgrades - Modifications to the autoclaves have been completed to enhance safety. These include modifications to allow testing for both inner and outer containment valves, addition of manual actuation devices to place the autoclaves in containment upon observation of a release, modifications to allow automatic closure of valves upon detection of a release, and replacement of pressure monitoring instrumentation.

- Exceptions for Criticality Accident Alarm System - The portable criticality accident alarm detectors were replaced with permanent detectors in Building C-710.

- Posting of Radioactive Material - All of the leased areas within the site boundary have been completely characterized regarding the type, extent, and amount of radioactive material present, and all areas have been properly posted.

- Management Controls - USEC completed development and implementation of programmatic controls to ensure effective oversight and compliance with NRC requirements, including policies and directives, management systems, and procedures. Position descriptions have been revised to contain all the requirements from the application documents.

- Plant Changes and Configuration Management - The necessary programs and procedures are now in place to ensure that the review and approval of changes to the plant and plant operations are accomplished in a controlled manner to maintain the plant configuration as described in the application documents. The plant has identified and documented the system boundaries and support systems required for performance of safety functions and included them in the configuration management program. USEC has upgraded procedures, developed improved records management programs, and completed training for plant personnel.

- Operations Program - Procedures addressing the operations program elements were developed or revised, and associated training was completed. Continuing training material and qualification requirement development was completed, and appropriate personnel were trained and qualified.

- Quality Assurance Program Implementation - USEC put in place all the necessary policies and procedures to fully implement the quality assurance program, including development and implementation of procedures for the scheduling and conduct of internal and supplier audits and those procedures that define procurement, handling and storage activities.

- Depleted Uranium Management Plan - The program for storing depleted uranium now includes documented baseline visual inspections to verify proper positioning and to detect cylinder damage. USEC also has procedures in place to conduct follow-up visual inspections to detect cylinder deterioration.

- Systems Approach to Training - A formal systems approach to training is now in place for all personnel who operate, maintain or modify systems, structures, or components important to safety. USEC has completed all the training development activities and trained those individuals covered by this Compliance Plan issue.

- Maintenance Program - USEC has upgraded the maintenance program to increase the rigor and documentation required of the program. Procedures have been either upgraded or developed for the maintenance program. A trend analysis program has been implemented. All maintenance-related training has been completed.

- Records Management and Document Control Program - The program has been upgraded such that the site's records and documents are maintained in retrievable form, including documents that support the safety basis of the plant. Records are protected against damage, deterioration, or loss. USEC has now implemented a comprehensive, centralized records management program that identifies, captures and maintains necessary documents.

- Operational/Safety System Trip Redundancy - USEC conducted a review of system designs to determine where operational trips and alarms coincided with the setpoints for safety system actuation based on the same monitored parameter and the same equipment actuated. USEC had three systems where the operational trips coincided with the setpoints for safety system actuation, based on the same monitored parameter and the same equipment actuated. USEC is either treating the operational trip as a safety system actuation or has provided justification for maintaining the existing alarms and trips.

- Decommissioning Funding Program - USEC submitted executed documents required to assure adequate funding for USEC's decontamination and decommissioning costs, primarily the cost of depleted uranium tails disposition. These documents were submitted after USEC was privatized.

- UF_6 Leak Detector Sensitivity Testing - USEC developed a testing methodology to better quantify the leak test method for UF_6 leak detectors. USEC used the methodology to complete testing for all detectors.

A significant safety issue, specific to Paducah, that is currently being resolved, involves seismic upgrading of two main process buildings. During the upgrading of the SAR for Paducah, DOE discovered that a significant number of piping attachments could fail, and two of the main process buildings could suffer significant damage from an earthquake of lower intensity (greater frequency) than the evaluation basis earthquake. DOE was responsible for regulatory oversight of the GDPs at the time this was discovered. DOE required that USEC develop a plan for improving the seismic resistance and imposed process constraints on the operation of the Paducah plant to significantly reduce the risk of release of radioactive and hazardous material (UF_6) in the event of an earthquake. Both NRC and DOE require that the GDP safety-related structures be designed to withstand natural phenomena, including earthquakes. During development of the Paducah Compliance Plan, USEC committed to, and NRC approved, a plan to strengthen the buildings to improve the seismic resistance of the structures and piping attachments. The Paducah Compliance Plan also

requires USEC to continue to operate under the process constraints to reduce the risk of UF_6 release during an earthquake until the seismic upgrades have been completed. USEC is required to complete the modifications to improve the seismic resistance of the structures and piping attachments by June 30, 1999. USEC has informed NRC that these modifications are currently behind schedule and that the upgrades cannot be completed by the current due date. USEC is evaluating the overall project to determine if more efficient design and/or work methods can be implemented.

STATUS OF PORTSMOUTH COMPLIANCE PLAN

Of the 46 issues listed in the Portsmouth Compliance Plan, 40 have been completed (i.e., USEC has informed NRC that it has fulfilled all the individual actions described in a Compliance Plan issue). However, as noted previously, USEC is conducting a reassessment of Compliance Plan items which may cause these numbers to change. Of the 40 issues that have been completed, 12 issues were completed between October 1, 1997, and September 30, 1998, the close of the reporting period. These 12 issues, along with a description of the issue, follow:

- Update the Application Safety Analysis Report - USEC submitted an amendment request to revise the SAR to reflect the updated information, including the revised accident analysis and technical safety requirements.

- Fire Protection Procedures and Hot Work Permit Program - Fire protection procedures, such as those needed to perform welding and burning, fire hazard assessments, and testing and inspection of fire suppression systems, were revised to include sufficient technical guidance and process controls to ensure understanding of requirements and implementation by all personnel. Further, the permit program to perform welding, burning, and other hot work now ensures Fire Services involvement and oversight.

- Management Controls - USEC completed development and implementation of programmatic controls to ensure effective oversight and compliance with NRC requirements, including policies and directives, management systems, and procedures. Position descriptions have been revised to contain all the requirements from the application documents.

- Plant Changes and Configuration Management - The necessary programs and procedures are now in place to ensure that the review and approval of changes to the plant and plant operations are accomplished in a controlled manner to maintain the plant configuration as described in the application documents. The plant has identified and documented the system boundaries and support systems required for performance of safety functions and included them in the configuration management program. USEC has upgraded procedures, developed improved records management programs, and completed training for plant personnel.

- Systems Approach to Training - A formal systems approach to training is now in place for all personnel who operated, maintained or modified systems, structures, or components important to safety. USEC has completed all the training development activities and trained those individuals covered by this Compliance Plan issue.

- Maintenance Program - USEC has upgraded the maintenance program to increase the rigor and documentation required of the program. Procedures have been either upgraded or developed for the maintenance program. A trend analysis program has been implemented. All maintenance-related training has been completed.

- Operations Program - Procedures addressing the operations program elements were developed or revised, and associated training was completed. Continuing training material and qualification requirement development was completed, and appropriate personnel were trained and qualified.

- Quality Assurance Program Implementation - USEC put in place all the necessary policies and procedures to fully implement the quality assurance program, including development and implementation of procedures for the scheduling and conduct of internal and supplier audits and those procedures that define procurement, handling and storage activities.

- Materials Control and Accountability Manuals and Procedures - All new and revised procedures are in place, and training is complete.

- Exceptions for Criticality Accident Alarm System - USEC removed the waste from the process area of Building X-744H so criticality accident alarm coverage was no longer needed for the area.

- Criticality Accident Alarms for Nearby Buildings - Criticality accident alarms must annunciate in nearby buildings. Several buildings (within 60.96 meters (200 feet) of evacuation zones) did not have evacuation horns and lights that activated when the alarm in a nearby building was activated. USEC installed evacuation horns and/or lights in the unalarmed buildings that were within the evacuation zone of alarmed buildings.

- Decommissioning Funding Program - USEC submitted executed documents required to assure adequate funding for USEC's decontamination and decommissioning costs, primarily the cost of depleted uranium tails disposition. These documents were submitted after USEC was privatized.

CHAPTER 4

HEALTH, SAFETY, AND ENVIRONMENTAL STATUS

NRC has responsibility for assuring that the health and safety of the public and the workers at the GDPs are protected from hazards involving radioactive material. Section 76.60 requires USEC to comply with applicable sections of 10 CFR Part 20, "Standards for Protection Against Radiation." Health, safety, and environmental conditions are reflected in radioactive doses received by workers and radioactive effluents. This chapter contains information relating to the HS&E conditions for the leased areas of the GDPs under NRC regulatory oversight. For a discussion of the HS&E conditions in the non-leased areas under DOE regulatory oversight, see the DOE report entitled "Department of Energy Input to the Nuclear Regulatory Commission's Annual Report to Congress Regarding the Status of Environmental, Safety, and Health Conditions at the Paducah and Portsmouth Gaseous Diffusion Plants for Fiscal Year 1998," DOE/ORO-2074, October 1998.

Both Paducah and Portsmouth monitor air and water emissions to the environment and maintain environmental dosimeters to monitor gamma radiation levels both onsite and offsite. The most recent data from the environmental dosimeters show that ambient gamma exposure at the site boundaries for both Paducah and Portsmouth are not statistically different from offsite monitoring locations. Radiation from the plants, both direct and from effluents, does not result in any detectable contribution to the total background external gamma radiation at the unrestricted site boundaries. Doses to the nearest offsite individuals from exposure to radioactive effluents are projected to be 0.06 millirem (mrem) [0.0006 milliSievert (mSv)] at Portsmouth and less than 0.05 mrem (0.0005 mSv) at Paducah for calendar year 1998, based on data measured to date. These values are well below the NRC regulatory limit of 100 mrem/year (1 mSv/year) for members of the public and the 10 mrem/year (0.1 mSv/year) constraint on air emissions of radioactive material specified in 10 CFR Part 20.

The maximum occupational dose received by a worker at either plant in 1997 was 365 mrem (3.65 mSv). The 1998 data indicate that no worker is expected to exceed 500 mrem (5 mSv), which is the Administrative Control Level used by the plants. The maximum occupational dose received by any worker for the first half of calendar year 1998 is approximately 221 mrem (2.21 mSv). These values are within the historical ranges for the sites and well within the NRC regulatory limit of 5000 mrem/year (50 mSv/year) specified in 10 CFR Part 20 for individuals. There were no instances where 10 CFR Part 20 individual limits for workers, including the 10 milligram per week intake of soluble uranium, were exceeded. There were no planned special exposures at the GDPs, as permitted by NRC regulations, between October 1, 1997, and September 30, 1998.

There are a number of HS&E improvements that USEC has either recently completed or that are now in progress. Some of these improvements are part of USEC's effort to achieve compliance with NRC regulations and are included in the Compliance Plans;

however, some of the HS&E improvements were initiated by USEC and are neither required by NRC nor included in the Compliance Plans. Improvements include the following:

Nuclear Safety:

- Completed the refeed of HEU material at Portsmouth (under DOE regulatory oversight);
- Continued to upgrade the criticality accident alarm system (CAAS) at both plants;
- Initiated seismic upgrades and conducted analysis to determine if seismic-related deficiencies exist; and
- Continued to upgrade the SARs.

Industrial Safety:

- Improved the control of freon, including identification and repair of leaks;
- Completed combustible loading analysis for process buildings;
- Certified Emergency Medical Technicians to use defibrillators in the event of medical emergencies;
- Conducted asbestos abatement in the steam plant at Paducah to protect the workforce; and
- Improved the control of hydrogen fluoride to reduce exposure of personnel.

Radiation Protection:

- Decontaminated additional areas;
- Completed site characterization surveys;
- Completed efforts to reduce personnel doses; and
- Reduced the generation of mixed waste at both sites through implementation of the Pollution Prevention and Waste Minimization program.

CHAPTER 5

CERTIFICATION ACTIVITIES

AMENDMENTS TO THE CERTIFICATES OF COMPLIANCE

10 CFR 76.45 describes the process for amending the certificates to cover new or modified activities or to change commitments made in the Compliance Plans. On receipt of an amendment application, NRC determines whether the amendment is significant. If the amendment is determined to be significant (e.g., margin of safety is reduced), then the amendment is published in the Federal Register for public comment, and possibly, subsequent public meetings. For all amendments, regardless of significance, NRC issues its decision to either grant or deny the amendment and publishes the decision in the Federal Register to provide an opportunity for interested parties to review the decision before the amendment is issued.

NRC has received seven new certificate amendment requests for Paducah and ten for Portsmouth from October 1, 1997, through September 30, 1998. In addition, there were eight requests pending for both plants on October 1, 1997. During this period, six and nine amendments have been issued for Paducah and Portsmouth, respectively. As of September 30, 1998, of the amendment requests submitted for Paducah, three Director's Decisions have been published in the Federal Register but the amendments have not been issued; five are under review, and one was closed because it was superseded. As of September 30, 1998, of the amendment requests submitted for Portsmouth, one Director's Decision has been published in the Federal Register but the amendment has not been issued; seven are under review, and one was closed because it was superseded. Some of the requests were submitted in conjunction with the resolution of issues contained in the Compliance Plans. NRC requested that DOE also review those amendment applications that revise the Compliance Plans so as to assure that the Compliance Plans remain DOE-prepared plans, as required by the statute. A listing of the amendment requests for Paducah and Portsmouth is provided in Appendix C.

RECERTIFICATION

USEC submitted its applications for renewal to NRC on April 15, 1998. The renewal applications did not contain any changes to the existing documentation. The application was based on USEC's initial applications, as revised by NRC approved amendments. USEC incorporated by reference previous applications, statements, and reports into the renewal application. After NRC completed its review, considered public comments, and consulted with EPA, NRC prepared Compliance Evaluation Reports (CERs) for Paducah and Portsmouth. NRC concluded, in the CERs, that the applications, including the Compliance Plans, fulfill the requirements of 10 CFR Part 76. The Certificates of Compliance will be issued for a period of five years.

PRIVATIZATION

A major regulatory activity, for this period, that affects future certification of the GDPs was the privatization of USEC. On April 26, 1996, the President signed the U.S. Enrichment Corporation Privatization Act, which directed USEC to implement a privatization plan. USEC developed a privatization plan containing two alternative methods of privatizing: (1) a sale through an initial public offering of common stock or (2) a merger and acquisition. The NRC prepared a Standard Review Plan (SRP) in cooperation with the other involved government agencies to describe NRC's review process and acceptance criteria to approve the transfer of the Certificates of Compliance to the privatized entity. In January 1998, USEC was authorized by the U. S. Treasury Department to begin a dual-path process to privatize USEC through either a merger and acquisition or an initial public offering of common stock.

The Commission determined that the private corporation would meet all applicable NRC regulatory requirements, including those derived from the National Industrial Security Program that restricts foreign involvement in entities that require access to classified information and the USEC Privatization Act regarding foreign ownership, control, and domination; common defense and security; and the maintenance of a reliable and economical source of domestic enrichment services. These conclusions were based on a review of the documentation and on interactions with DOE and other appropriate agencies of the United States government. The Commission provided its consent to the transfer of the Certificates of Compliance to a privatized corporation on May 28, 1998. On June 29, 1998, the USEC Board of Directors announced its decision to privatize USEC through an initial public offering of securities to the public. The Board concluded that the sale of USEC to the public through an initial public offering best met the statutory criteria, provisions, and requirements governing the sale. The decision was approved by the U.S. Treasury Department. USEC was formally privatized by the U.S. Treasury Department on July 28, 1998.

CHAPTER 6

INSPECTIONS

10 CFR Part 76, Subparts F and G; 10 CFR 76.70; 10 CFR 76.72; 10 CFR Part 95; and 10 CFR Part 2 address NRC inspections of the GDPs, violations of NRC regulations, and civil penalties. These regulations implement NRC authority to take enforcement action for violations of the AEA; NRC regulations; or conditions of a certificate, Compliance Plan, or Order. Further, these regulations state that NRC may impose civil penalties for certain violations of NRC regulations.

Violations of NRC regulations are classified into one of four severity levels, with Severity Level I being assigned to violations that are most significant and Severity Level IV being assigned to violations that are least significant. Further, there are other violations of minor safety or environmental significance that are below the level of significance of Severity Level IV violations. These violations, which must meet certain criteria, are not usually the subject of formal enforcement action. To the extent such violations are described in the inspection reports, they are noted as non-cited violations (NCVs). A group of Severity Level IV violations may be evaluated in the aggregate and assigned a single, increased severity level (Severity Level III) if the violations have the same underlying cause or programmatic deficiencies. More information about the NRC Enforcement Policy is provided in NUREG-1600, Rev.1, "General Statement of Policy and Procedures for NRC Enforcement Actions" and NUREG/BR-0195, Rev. 1, "NRC Enforcement Manual."

NRC performed a total of 57 inspections, totaling approximately 9700 inspection-hours (4300 hours for Paducah, 5400 hours for Portsmouth), at both Paducah and Portsmouth between October 1, 1997, and September 30, 1998. These inspection hours include the activities of two resident inspectors at each GDP site and specialist inspections by inspectors from the Region III office and NRC Headquarters office. One hundred and two violations overall were identified as a result of the inspections. Except for one special inspection at each site, all of the inspections were routine inspections. The majority of the violations were in the areas of criticality safety, security, and procedures, either implementing incorrect procedures or failing to follow procedures. With three exceptions, all of the violations were either Severity Level IV or NCVs. There was one Severity Level III violation at Paducah for the failure to control classified information, where USEC failed to properly implement provisions of its security plan, which resulted in a $55,000 civil penalty. There was one Severity Level III violation and one Severity Level III problem identified at Portsmouth, each with an associated $55,000 civil penalty. The Severity Level III problem was the result of a special inspection at Portsmouth, in which the inspection team identified numerous violations associated with the implementation of the nuclear criticality safety program (NCS) as a whole. The Severity Level III violation was identified during a routine regional inspection and involved a deficiency in the maintenance and surveillance program for safety-related valves. The violation raised concerns about the ability of the autoclave containment isolation valves to

perform their intended safety function. For all violations identified during inspections, USEC either took corrective action to bring the facility back into compliance with NRC regulations, or in the case of the criticality safety program at Portsmouth developed a comprehensive corrective action plan.

The NRC also issued a Confirmatory Order for the Paducah plant in response to the NRC's identification that in the event of an evaluation basis earthquake, the accumulators could fail resulting in a uranium hexafluoride release that could have greater offsite consequences than previously assumed.

During the review period, NRC required USEC to investigate the NRC's concern regarding the potential for a chilled environment to be developing, or in existence, at the Portsmouth and Paducah GDPs. USEC engaged a contractor to independently characterize the nuclear safety culture including the environment for addressing employee concerns at the GDPs. The USEC investigation concluded that the majority of responding individuals did not feel harassed or intimidated or that retaliation or retribution would occur if they identified concerns to management. USEC did identify "pockets" of individuals who did believe that they would be retaliated against by management for identifying concerns. USEC is developing an action plan to correct the problems which were identified during the investigation.

INSPECTION SUMMARY FOR PADUCAH

During the period October 1, 1997, through September 30, 1998, NRC Headquarters and regional personnel, including the resident inspectors, conducted 50 routine inspections and one special inspection, totaling approximately 4300 inspection-hours, of plant operations, plant maintenance, plant support, engineering, fire safety, chemical process safety, nuclear criticality safety, MC&A, and security of classified information.

The inspections resulted in one Severity Level III violation, one Confirmatory Order, and 27 Severity Level IV violations assessed against USEC. Nineteen non-cited violations were also documented in inspection reports. The one Severity Level III violation, which was of significant regulatory concern, involved a breakdown of the USEC security program for failure to properly implement certain provisions of its security plan. NRC noted in an inspection report issued in July 1998, that the corrective actions taken by USEC for the Severity Level III violation of the security program for control of classified matter were comprehensive. The April 1998, Confirmatory Order was issued in response to the NRC's identification that in the event of an evaluation-basis earthquake, the uranium hexafluoride accumulators could fail resulting in greater offsite consequences to members of the public than previously assumed. NRC issued the Confirmatory Order to limit the amounts of uranium hexafluoride in the accumulators to minimal levels until corrective actions to increase the seismic capabilities of the accumulators to withstand the evaluation-basis earthquake were complete. USEC has completed the required modifications. NRC has confirmed the completion of the modifications through direct field observations. In all cases, corrective

actions and plans were taken by USEC to reestablish compliance with NRC regulations. A brief summary of the Level IV violations is provided below.

Nine violations involved NCS-related issues. The violations included conducting potentially fissile material activities without a nuclear criticality safety evaluation or approval; failure to include certain operational controls in an approval into the implementing procedure; failure to perform a TSR surveillance for a cascade deposit containing an amount of fissile material greater than safe mass; and violations of certain criticality safety controls. Five violations involved failures to properly implement the Quality Assurance Program requirements. The violations included improperly identifying and implementing design controls and not verifying all aspects of the design for CAAS modifications, lack of effective corrective action for a criticality safety violation, lack of appropriate written instructions for switchyard fire sprinkler testing that affected the CAAS system, and failure to fully implement the quality assurance requirements. Seven violations involved use of improper procedures or failure to implement procedures involving various activities and different functional groups at the site, both during routine operations and in response to events. Three violations involved improper implementation of the requirements in 10 CFR 76.68 for evaluating and approving plant changes or as-found discrepancies between the actual plant and the design basis in the SAR. One violation involved the late submittal of the SAR upgrade. One violation involved the failure to ensure that the quality assurance requirements associated with the fabrication of UF_6 cylinders were properly implemented. Finally, a violation was issued for the lack of a fully functional TSR-required design feature for rail stops for a cylinder levelator (lift) to prevent the cylinder scale cart from rolling off the lift.

NRC closed a Confirmatory Action Letter issued to USEC on February 28, 1997, for criticality safety deficiencies associated with the Building C-400 spray booth and cylinder cleaning operations. The corrective actions taken by USEC were comprehensive and corrected the deficiencies.

INSPECTION SUMMARY FOR PORTSMOUTH

During the period October 1, 1997, through September 30, 1998, NRC Headquarters and regional personnel, including the resident inspectors, conducted 25 routine inspections and one special inspection, totaling approximately 5400 inspection-hours, of plant operations, plant maintenance, plant support, engineering, fire safety, chemical process safety, nuclear criticality safety, MC&A, and security of classified information.

The inspections resulted in 44 Severity Level IV violations assessed against USEC. Nine non-cited violations were also documented in inspection reports. One Severity Level III violation and one Severity Level III problem warranted civil penalties of $55,000 each. In all cases, USEC took or is taking corrective actions to reestablish compliance. A brief summary of the Level III and IV violations is provided below.

Nine of the violations involved NCS-related issues. The Severity Level III problem involved 16 examples of programmatic problems in the NCS and self-assessment areas; five of the remaining NCS violations involved failure to implement nuclear criticality safety approval (NCSA) administrative controls; one violation involved not having an NCSA as required; and two violations involved failure to get the Plant Operations Review Committee (PORC) approval before revising NCSAs. The Severity Level III violation involved a failure to demonstrate that safety-related components would perform their intended safety function. Fourteen Level IV violations resulted from either incorrect procedures or a failure to adhere to procedures, including two examples of failure to make required notifications to NRC for reportable events. Seven violations involved improper implementation of TSRs. These seven violations included systems that were operated without the required safety components available/calibrated, failure to maintain TSR required minimum staffing in a UF_6 withdrawal facility, and failures to comply with required action statements during maintenance/surveillance activities. One violation involved the late submittal of the SAR upgrade. Two violations were related to the Compliance Plan. One of the violations was for failure to implement the requirements of the Compliance Plan and the other was for failure to provide complete and accurate information in USEC's quarterly status reports. The remaining violations involved ineffective corrective actions; training deficiencies; and non-conformance with the security plan.

In response to the NCS problems, USEC has put in place a comprehensive corrective action plan (CAP) to correct the known NCS program and implementation deficiencies. The reduction in the number of NCS deficiencies at Portsmouth indicates that the NCS CAP is having a significant positive impact on the implementation of the NCS program.

CHAPTER 7

EVENT REPORTS

Section 76.120 describes the requirements for reporting certain events to NRC. The regulations specify events that must be reported to NRC within three different time limits and describe the contents and schedule for submitting follow-up written reports. USEC is required to report criticalities, loss of special nuclear material, and emergency conditions that have been declared an alert or site area emergency to the NRC operations center within 1 hour after discovery. Events that prevent immediate protective actions necessary to avoid releases or exposures to radiation or radioactive materials that could exceed regulatory limits must be reported to the NRC Operations Center within 4 hours after discovery. The third reporting requirement specifies that certain contamination events, failure of certain TSR safety equipment with no backup equipment available, fires or explosions that damage radioactive material or containers holding radioactive material, and events that require offsite medical treatment of a contaminated person must be reported to the NRC Operations Center within 24 hours. USEC also reports losses and compromises or possible compromises of classified information or classified documents as required by 10 CFR 95.57. Although not required by 10 CFR Part 76, USEC also reports safety system actuations, notifications made to other State and Federal agencies, and loss of contingency for nuclear criticality safety.

A summary of event reports for events that occurred between October 1, 1997, and September 30, 1998, is provided below.

EVENT NOTIFICATION SUMMARY FOR PADUCAH

There were 67 reported events at Paducah during the period. Thirty-seven of the reported events involved NCS. The NCS-related events that were reported mostly resulted from instances where the CAAS was inoperable, there was a lack of an NCSA to cover the specific operation, or there were violations of NCSAs. The NCSA control deficiencies were related to improper storage, incorrect spacing requirements, inability to maintain safe volume, and inadequate procedures/equipment issues. The majority of the inoperable CAAS events were due to either loss of air to the horns or loss of power. None of the NCS-related reported events at Paducah resulted in escalated enforcement action.

There were nine reported events related to the UF_6 release detection systems. These events mostly involved inoperable systems due to various reasons such as tripped circuit breakers, failure of system to reset, and loss of power. In addition, seven reported events were related to the autoclaves, in that an autoclave safety system actuated or autoclave subsystems did not perform properly. One reported event resulted from a Normetex pump trip resulting in a safety system actuation. Four reported events resulted from asbestos spills or oil leaks to the environment and one report resulted from a chlorine gas release. The remainder of the reports were security reports where classified information was potentially compromised or security procedures were not followed.

If the event notification involved a noncompliance with NRC regulations, actions were taken to assure that compliance with NRC regulations was reestablished.

EVENT NOTIFICATION SUMMARY FOR PORTSMOUTH

There were 183 reported events at Portsmouth during the period. There were 155 event reports that dealt with NCS. The discovery of NCS problems early in the review period at Portsmouth resulted in increased attention to the issues and produced the subsequent large number of NCS related event reports. The number of NCS reports is trending downward as the plant corrects identified deficiencies. The NCS related event reports, for the most part, resulted from violations of NCSA-identified controls and requirements. For the majority of the reported NCS events, the safety significance was minimal due to maintaining at least one of the controls. In those cases where both controls were lost, the failure scenario that could lead to a criticality was considered unlikely based on historical data. None of the events resulted in any significant injuries to workers or members of the public or degradation of the environment. The extent of NCS problems at Portsmouth resulted in escalated enforcement action and a comprehensive corrective action program to address the NCS problems.

There were nine events involving the shutdown of the autoclaves because of high condensate levels, inoperable containment valves, improper installation of autoclave isolation valves, or other safety system actuations. Six reported events resulted from violations of the National Pollutant Discharge Elimination System (NPDES) permit or opacity limits and an oil leak to the environment. One event involved an indoor release of approximately 17.7 kilograms (39 pounds) of liquid UF_6 at the tails withdrawal station. The release did not result in any injury and no measurable radioactivity was detected in the outside environment. Five of the events involved either activation of the UF_6 release detection system or inoperability of the system. The balance of the events involved the loss of control of classified information or potentially compromised classified information. Corrective actions were immediately taken in accordance with the security plan.

If the event notification involved a noncompliance with NRC regulations, actions were taken to assure that compliance with NRC regulations was reestablished.

CHAPTER 8

REGULATORY ACTIVITIES

RULEMAKING

Since initial certification of the GDPs, USEC has requested NRC approval of several amendments to its certificates. When processing the amendment requests, as described in 10 CFR 76.45, NRC identified several areas in the process that should be revised and improved so that they are more effective and efficient. NRC initiated a rulemaking to modify the process for certificate renewals and amendments, revise the appeal process for amendments, eliminate the significant designation for amendments, simplify the criteria for persons who are eligible to file a petition for review of the amendment action, remove references to the initial application because the initial certificates have been issued, and lengthen the time periods associated with filing a petition for review. The proposed rulemaking was published in the Federal Register for public comment on September 15, 1998 (63FR49301). The comment period ended November 16, 1998. NRC will consider the comments received in developing the final rule.

EMERGENCY PREPAREDNESS EXERCISE

On April 1, 1998, a full-scale emergency preparedness exercise was conducted at the Paducah GDP. NRC inspectors observed the drill. The response organizations of the State of Kentucky and the County of McCracken participated. The purpose of the exercise was to test the plant's capabilities to implement its Emergency Plan (EP), including the response of the various participants and the effectiveness of the information flow from the Paducah Emergency Operations Center. Overall performance during the exercise demonstrated that the onsite EP was effective, and that the staff was capable of implementing the EP by correctly classifying scenario emergencies, notifying offsite agencies of the event, activating emergency response personnel and facilities, providing protective action recommendations when warranted, and taking accident mitigation actions.

AVLIS

The USEC Privatization Act granted USEC the exclusive commercial right to deploy and use Atomic Vapor Laser Isotope Separation (AVLIS) patents, processes, and technical information owned or controlled by the Federal Government, upon completion of a royalty agreement with DOE. To the extent requested by USEC prior to privatization, and subject to the requirements of the AEA, the President was required to transfer title to all of the property owned by the United States or under its control that is useful for the development of AVLIS or alternative technologies for enriching uranium.

AVLIS technology involves processing uranium metal alloy feedstock rather than UF_6 gas, through the use of lasers and separator systems. Based on engineering studies, it is expected that an AVLIS facility will use only about 5 percent of the power used by the GDPs, require less capital investment than a new centrifuge plant, and use 20 to 30 percent less uranium to produce comparable amounts of EU. Currently, AVLIS development, demonstration, and design activities are being conducted at Lawrence Livermore National Laboratory in Livermore, California; General Electric Company in Wilmington, North Carolina; and Cameco Corporation in Port Hope, Ontario, Canada.

In July 1994, USEC's Board of Directors authorized USEC management to begin taking steps necessary to commercialize the AVLIS technology. In April 1995, USEC entered into an agreement that provided for the transfer of intellectual and physical property pertaining to AVLIS technology from DOE. By letter dated October 6, 1998, USEC informed the NRC that it expects to submit a license application to NRC no earlier than December 1999 to obtain an NRC license to construct an AVLIS facility. USEC is investigating alternative sites and plans to announce the site location in the spring of 1999. USEC has submitted some preliminary reports for NRC review, and preliminary meetings are being conducted on nonsite-specific technical issues. NRC will continue to participate in these meetings and to review reports submitted by USEC.

The AVLIS project will present some unique and highly complex issues for NRC review. Since this is the first facility to employ laser technology, NRC currently has no documents to guide its review of such a facility, other than a general 10 CFR Part 70 SRP. To remedy this situation, the staff has an SRP for AVLIS in development, based on the proposed Part 70 SRP, to assist the staff in its AVLIS review. The AVLIS technology will present some unique issues in the areas of: nuclear criticality safety (novel forms of EU consisting of vapor and metal), criticality computer code validation, accident analysis, material control and accounting, fire, explosions, and other issues. NRC currently has a project manager working nearly full-time on the AVLIS activities and other technical staff working part-time on AVLIS reviewing pre-licensing application submittals. Thus far, NRC activities concerning AVLIS have consisted of reviewing the AVLIS Quality Assurance Plan, the AVLIS Nuclear Criticality Safety Validation Report, and the Classified Matter Protection Plan, as well as conducting preliminary meetings with USEC on these and other topics and to lay the groundwork for USEC's AVLIS license application. NRC resources provided for one full-time equivalent in fiscal year (FY) 1998 to initiate preparation of the staff's guidance and to initiate review of the AVLIS preliminary submittals from USEC. Budgeted resources increase in FY 1999 as NRC recruits and trains staff in preparation of receipt and review of the AVLIS application.

Current law (section 193(b) of the Atomic Energy Act) requires the Commission to conduct "a single adjudicatory hearing on the record with regard to the licensing of the construction and operation of a uranium enrichment facility" such as the proposed AVLIS facility. The Commission in a September 4, 1998, staff requirements memorandum stated

that "the NRC should consider seeking legislation that would modify section 193's inflexible approach to hearings." The Commission directed the staff "to review and advise the Commission on legislative and rulemaking options that would further enhance the Commission's ability to utilize informal procedures in any proceeding in which formalized trial type procedures are currently used." That staff report is due to the Commission on December 31, 1998. The Commission will report to Congress on its decision whether to seek an amendment to section 193 as part of its FY 2000 legislative program.

CHAPTER 9

NRC CONSULTATION WITH EPA AND DOE

RESULTS OF DOE CONSULTATION

DOE provided a report entitled "Department of Energy Input to the Nuclear Regulatory Commission's Annual Report to Congress Regarding the Status of Environmental, Safety, and Health Conditions at the Paducah and Portsmouth Gaseous Diffusion Plants For Fiscal Year 1998," DOE/ORO-2074, October 1998, to assist NRC in preparing the report. Information from DOE's report was included in various sections of this report, as appropriate.

The DOE report provides information about the status of health, safety, and environmental conditions of those portions of the gaseous diffusion uranium enrichment facilities for which DOE retained oversight responsibility during FY 1998. DOE's report also addresses its activities regarding HEU at Portsmouth, including HEU refeed suspension and removal and transparency programs conducted by DOE, and describes the MOU employed by DOE and NRC to ensure effective and efficient cooperation in their joint oversight of activities conducted at the GDPs.

DOE SUMMARY OF PADUCAH

DOE accomplishments and initiatives to enhance and improve HS&E conditions at Paducah between October 1, 1997, and September 30, 1998, include, but are not limited to, the following:

- Issued an upgraded SAR for the nonleased facilities;
- Worked approximately 866,332 hours during FY 1998 with no occupational injuries that caused any employee to miss a day of work;
- Painted 1200 depleted UF_6 cylinders to minimize corrosion and completed construction of an additional concrete cylinder storage yard as part of the continued response to a 1995 recommendation from the Defense Nuclear Facilities Safety Board;
- Received regulatory approval to clean up a former cylinder drop test site using the in-situ soil remediation technology (LASAGNE™) which was successfully demonstrated at Paducah by DOE and the industry partners who developed it;
- Disposed of 5987 metric tons (6600 tons) of waste either in DOE landfills or at approved commercial facilities;
- Transferred or awarded the sale of 50 percent of the surplus fluorine cells and equipment previously used to manufacture UF_6 feed material and fluorine, resulting in an anticipated cost savings of more than $2 million; and
- Extracted and treated more than 749.5 million liters (198 million gallons) of contaminated groundwater.

Environmental releases and discharges from DOE activities during FY 1998 remained within established regulatory limits, with the exception of three minor exceedances of its Kentucky Pollutant Discharge Elimination System permit effluent limits. Average occupational radiation exposure for DOE personnel at Paducah was 5.6 mrem (0.056 mSv) for calender year (CY) 1997 which is substantially less than the DOE occupational exposure limit of 5000 mrem (50 mSv) specified in 10 CFR 835.

DOE SUMMARY OF PORTSMOUTH

DOE accomplishments to enhance and DOE initiatives to improve HS&E conditions at Portsmouth between October 1, 1997, and September 30, 1998, include, but are not limited to, the following:

- Issued an upgraded SAR for the nonleased facilities;
- Completed painting of skirted DUF_6 cylinder ends to prevent corrosion, and completed restacking of over 15,000 DUF_6 cylinders to enhance inspections;
- Disposed of over 1109 metric tons (1223 tons) of soils and sludges;
- Completed HEU refeed activities;
- Continued to recycle paper products, aluminum cans, and scrap metal;
- Capped the Peter Kiewit Landfill and the X-735 Industrial Solid Waste Landfill ahead of schedule and under budget;
- Initiated three pilot projects to evaluate different treatment technologies. These projects will evaluate the dynamic underground steam stripping, and in situ chemical oxidation and recirculation processes, and will test the effectiveness of a vacuum-enhanced recovery method;
- Submitted the Quadrant I draft final Cleanup Alternatives Study/Corrective Measures Study (CAS/CMS) to Ohio EPA;
- Received approval from the Ohio EPA on the Quadrant III CAS/CMS; and
- Submitted the final Quadrant IV CAS/CMS to Ohio EPA.

There were no exceedences of the National Pollutant Discharge Elimination System (NPDES) permit limits at Portsmouth. In early July, the Ohio EPA issued a Notice of Violation involving a 90-day hazardous waste accumulation area. The violation was abated on August 19, 1998. Average radiation exposure for DOE workers at Portsmouth was 1.65 mrem (0.0165 mSv) per person for CY 1997, which is substantially less than the DOE occupational exposure limit.

For both GDPs, DOE has not identified any instances of substantial noncompliance with those laws for which it had oversight responsibility during FY 1998, with the exception that Paducah reported a few Price-Anderson Amendment Act violations. In addition, both Paducah and Portsmouth identified minor environmental violations. Incidents at both GDPs involving violations of Department of Transportation regulations also occurred. These occurrences are discussed in DOE's report (DOE/ORO-2074). In all these instances, actions were taken to notify appropriate authorities, identify the cause of the violation, and institute corrective measures.

RESULTS OF EPA CONSULTATION

ENVIRONMENTAL SUMMARY OF PADUCAH

The Paducah GDP is part of EPA Region 4. The environmental regulatory authority over Paducah is both Federal and State (the Commonwealth of Kentucky). EPA has delegated many of its environmental authorities to the Commonwealth of Kentucky, such as the Clean Air Act, Clean Water Act, and Resource Conservation and Recovery Act (RCRA). Therefore, most environmental regulatory oversight is provided by Kentucky.

During the time period from October 1, 1997, to September 30, 1998, Paducah has had the following environmental actions:

- Clean Air Act: The GDP is considered a major source under Title V of the Clean Air Act. The facility had one state inspection which resulted in no findings of noncompliance. The facility did not receive any notices of violation during the period. USEC is in compliance with the National Emissions Standards for Hazardous Air Pollutants.

- Clean Water Act: The GDP is considered a major source for Kentucky Pollutant Discharge Elimination System permit purposes. The facility had three state compliance inspections which resulted in no findings of noncompliance. DOE experienced three minor exceedances of its discharge permit for pH and TCE.

- RCRA: The GDP is a generator of hazardous waste and operates as such under an EPA identification number issued by the Kentucky Department for Environmental Protection. The facility is currently operating under an Agreed Order with the Kentucky Natural Resources and Environmental Protection Cabinet for disposal of its mixed wastes. The facility had one state compliance inspection which resulted in no findings of noncompliance. The facility received no notice of violations during the period.

- Comprehensive Environmental Response, Compensation, and Liability Act: The GDP's activities to clean up waste sites across the plant continued according to agreements and plans of the interested parties, (i.e., DOE, EPA, and the Commonwealth of Kentucky.)

- Toxic Substance Control Act: There were no inspections in this area during the period.

ENVIRONMENTAL SUMMARY OF PORTSMOUTH

The Portsmouth GDP is part of EPA Region 5. The environmental regulatory authority over this GDP is both Federal and State (State of Ohio). The EPA has delegated many of its environmental authorities to the State of Ohio, such as the Clean Water Act and RCRA. Most environmental regulatory oversight is provided by Ohio.

During the time period from October 1, 1997, to September 30, 1998, Portsmouth, has had the following environmental actions:

- Clean Air Act: The GDP is considered a major source. No compliance inspections were conducted during the period. USEC is in compliance with the National Emissions Standards for Hazardous Air Pollutants. However, on September 29, 1998, the GDP did receive a Finding of Violation from EPA-Region 5 for failure to submit a timely annual report to demonstrate compliance with the National Emission Standards for Hazardous Air pollutants for radionuclides. EPA notified the GDP in mid-July that it had not received the report, and USEC immediately sent a copy.

- Clean Water Act: The GDP is considered a major source. Ohio EPA conducted a compliance evaluation inspection in March 1998. The GDP was in compliance with its permit conditions.

- RCRA: The GDP is considered a Large Quantity Generator under RCRA. No violations were noted during an Ohio EPA compliance evaluation inspection in June 1998.

- Comprehensive Environmental Response, Compensation, and Liability Act: The GDP's activities to clean up waste sites across the plant continued according to agreements and plans of the interested parties, (i.e., DOE, EPA, and the State of Ohio.) Ohio has the lead in day-to-day oversight of clean-up activities at Portsmouth.

- Toxic Substance Control Act: In March 1998, the GDP received a Notice of Noncompliance from EPA-Region 5 for deficiencies noted during a polychlorinated biphenyl inspection conducted by Ohio EPA on behalf of EPA-Region 5. The deficiencies have been appropriately addressed.

CHAPTER 10

SUMMARY ASSESSMENT OF PERFORMANCE

The GDPs at Paducah and Portsmouth are more than 40 years old, having been constructed in the 1950s. They were built at a time when design standards and quality assurance standards were significantly different from current requirements, and documentation requirements were less stringent. The age of the facilities, some poor documentation of design and safety bases, and the requirements in effect when the plants were constructed have resulted in difficulties in maintaining the physical condition of the facilities. These shortcomings have challenged USEC's performance during the period; however, both the material condition of the plants and the design and safety basis documentation are being upgraded.

During the review period, the Paducah and Portsmouth GDPs have provided adequate protection of health, safety, and environmental conditions and have generally operated in compliance with NRC regulatory requirements. There were no radiation-related deaths or illnesses due the use of radioactive materials and no significant radiation exposures. At both plants, offsite radiological doses, as well as doses to the workers, remained very low, and well within NRC regulatory limits. There was no loss or diversion of certified material. There have been no events, at either site, requiring activation of the emergency response centers nor were there any criticalities at either facility.

Overall performance at the Paducah GDP was adequate and continued to improve. This improving performance has been demonstrated by a reduction in the number of identified problems occurring as a consequence of inadequate or incomplete procedures at the plant. Plant operations and engineering staff worked more effectively together to identify and correct conditions which could lead to degradation of safety systems and in particular did a better review of the root causes for these situations. However, despite these improvements, plant staff training continues to be an area requiring improvement.

Plant maintenance and surveillance activities, associated with safety-related systems, structures, and components, were generally adequate. A significant improvement in the plant staff's handling of shutdown activities was observed during the implementation of a large-scale power reduction in the summer of 1998.

Early in the review period, NRC staff noted a decrease in the rigor and quality of some engineering analysis. The engineering organization was also challenged by the lack of a well documented and understood design bases, including the definition of applicable codes and standards. However, at the end of the review period, the engineering analysis used to substantiate the request for enforcement discretion in two instances, illustrated to the NRC staff that the rigor and quality of the engineering analysis is no longer decreasing.

Several self-assessment process improvements were implemented during the review period. The improvements, which included, an increased critical assessment of identified issues and a revised non-conformance reporting system, appeared to result in an increasing number of self-identified problems and an increasing staff focus on safety-related activities.

Overall performance at the Portsmouth GDP was also adequate. The conduct of plant operations was acceptable. During the review period, improvements were made in the plant staff's knowledge and understanding of nuclear criticality controls which resulted in an increased awareness of and adherence to nuclear criticality controls applicable to routine operations. However, consistent implementation of Technical Safety Requirements, adherence to plant policies and procedures, and communications across plant organizations were areas in which improvements continued to be warranted.

Plant maintenance activities, associated with safety-related systems were generally adequate. A strength was noted in the development and implementation of the mechanical integrity program. However, deficiencies were identified in the implementation of some maintenance and surveillance programs which involved the inadequate performance testing of autoclave containment valves, which are safety-related components. This inadequate performance testing resulted in the NRC issuing escalated enforcement action. Maintenance activities continue to be adversely affected by the plant material conditions as exemplified by condenser drain valve leakage and spurious autoclave isolation. However, management efforts initiated late in the review period were noted to have a positive impact on the development of solutions to some long-standing issues.

The lack of a well documented and understood design basis and a weak historical definition and implementation of the nuclear criticality safety program challenged the engineering organization. The challenges were reflected in problems with configuration control evaluations, the characterization and resolution of technical issues, and the quality of engineering evaluations. Significant programmatic deficiencies in the areas of nuclear criticality safety and self-assessment were also identified and resulted in escalated enforcement action. Comprehensive corrective actions for each of the deficiencies was implemented and, at the end of the review period, some improvements were noted in the nuclear criticality safety and self-assessment programs.

Finally, at the end of the review period, an apparent generic deficiency with the completion of corrective actions required as a part of the Portsmouth Compliance Plan was identified. As a result of the finding, plant management took steps to develop corrective actions for each of the deficiencies and developed a program to reverify the implementation of corrective actions required as a part of the Compliance Plan.

CHAPTER 11

SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS

Conditions at the GDPs at Paducah and Portsmouth are generally in compliance with NRC regulations. Exceptions are described in Compliance Plans, provided for by the AEA and approved by NRC, which document commitments for actions and schedules for achieving full compliance. Although the completion of Compliance Plan issues is being reassessed, USEC has made progress in completing issues in the Compliance Plans during this period. For those instances where, during the normal course of operations, violations of NRC regulations occurred, USEC generally took actions to reestablish compliance and developed plans to prevent recurrence.

USEC is required to comply with all NRC regulations applicable to the GDPs, most specifically 10 CFR Part 76. Other NRC regulations, or portions thereof, that apply include 10 CFR Part 19, "Notices, Instructions, and Reports to Workers: Inspection and Investigations"; 10 CFR Part 20, "Standards for Protection Against Radiation"; 10 CFR Part 21, "Reporting of Defects and Noncompliance"; 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material"; 10 CFR Part 71, "Packaging and Transportation of Radioactive Material"; 10 CFR Part 73, "Physical Protection of Plants and Materials"; 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material"; and 10 CFR Part 95, "Security Facility Approval and Safeguarding of National Security Information and Restricted Data."

As part of recertification activities, NRC performed a review to determine whether the operations at the GDPs comply with NRC regulations. The results of this review is described in Compliance Evaluation Reports, one each for Paducah and Portsmouth. In those reports, NRC concludes that there is reasonable assurance that the plants will continue to be operated such that public health and safety will be adequately protected. NRC further concludes that the application fulfills the requirements of 10 CFR Part 76. The Compliance Plans approved as part of the initial certification are still in place. Progress has been made on completing the noncompliances contained in the Plans. In addition, as part of NRC's review and approval of transfer of the Certificates of Compliance to the privatized entity, the Commission determined that the private corporation would meet all applicable NRC regulatory requirements, including those derived from the National Industrial Security Program that restricts foreign involvement in entities that require access to classified information and the USEC Privatization Act regarding foreign ownership, control, and domination; common defense and security; and the maintenance of a reliable and economical source of domestic enrichment services.

Between October 1, 1997, and September 30, 1998, NRC has identified 47 violations of NRC regulations, TSRs, or Compliance Plan commitments at Paducah and 55 at Portsmouth. Some of these violations were self-identified by USEC, whereas others were identified by NRC inspectors performing inspections. The majority of the violations were in the areas of nuclear criticality safety, security, and procedural deficiencies--either inadequate procedures or failing

to follow procedures. For those instances where noncompliances with NRC regulations were identified, plant management took corrective actions to bring the plant back into compliance or are now following a corrective action plan to bring the plant back into compliance. In many cases, plant management also identified long-term actions to prevent recurrence.

On March 9, 1998, USEC received a Severity Level III problem and a civil penalty for a programmatic breakdown in the nuclear criticality safety program at Portsmouth. A Severity Level III violation with civil penalty was issued to USEC on July 14, 1998. This was for a deficiency in the maintenance and surveillance program for air-operated, safety-related valves at the Portsmouth plant. On December 8, 1997, USEC received a Severity Level III violation and civil penalty for failure to properly control classified information at Paducah.

APPENDIX A

ABBREVIATIONS AND ACRONYMS

AEA	Atomic Energy Act
AVLIS	atomic vapor laser isotope separation
CAAS	criticality accident alarm system
CAP	corrective action plan
CAS/CMS	Cleanup Alternatives Study/Corrective Measures Study
CER	Compliance Evaluation Report
CFR	U.S. Code of Federal Regulations
CY	calendar year
DOE	U.S. Department of Energy
DUF_6	depleted uranium hexafluoride
EP	Emergency Plan
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 1992
EU	enriched uranium
FR	Federal Register
FSAR	final safety analysis report
FY	fiscal year
GDP	gaseous diffusion plant
HEPA	high efficiency particulate air
HEU	highly enriched uranium
HS&E	health, safety, and environmental
MC&A	material control and accounting
MOU	memorandum of understanding
mrem	millirem; a measure of radiological dose
M&TE	maintenance and testing equipment
NCS	nuclear criticality safety
NCSA	nuclear criticality safety approval
NCV	non-cited violation
NPDES	national pollutant discharge elimination system
NRC	U.S. Nuclear Regulatory Commission
PORC	plant operational review committee
RCRA	Resource Conservation and Recovery Act
QA	quality assurance
SAR	safety analysis report

SRP	Standard Review Plan
TSD	treatment, storage, and disposal
TSR	technical safety requirement
U^{235}	uranium-235
UF_6	uranium hexafluoride
USEC	United States Enrichment Corporation

APPENDIX B

COMPLIANCE PLAN ISSUES

ISSUES COMMON TO BOTH PADUCAH AND PORTSMOUTH

Issues	Status[1]	
	Paducah	Portsmouth
Transition from DOE Regulations to NRC Regulations	Complete	Complete
Update the Application Safety Analysis Report	*Complete	*Complete
Autoclave Upgrades	*Complete	2/1/01
Nuclear Criticality Safety Approval Documents	Complete	Complete
Nuclear Criticality Safety Approval Implementation	Complete	Complete
Exceptions for Criticality Accident Alarm System	*Complete	*Complete
Radiation Protection Procedures	Complete	Complete
Posting of Radioactive Materials	*Complete	12/31/98
NVLAP Certification	Complete	Complete
Fire Protection Procedures/Hot Work Permit Program	Complete	*Complete
Packaging and Transportation	Complete	Complete
Management Controls	*Complete	*Complete
Safety Committees	Complete	Complete
Plant Changes and Configuration Management	*Complete	*Complete
Maintenance Program	*Complete	*Complete
Operations Program	*Complete	*Complete
Systems Approach to Training	*Complete	*Complete
Event Investigations and Reporting Program	Complete	Complete
Records Management and Document Control Program	*Complete	12/31/98

[1] (a) Complete - U.S. Enrichment Corporation has informed NRC that it has fulfilled all the individual actions described in a Compliance Plan issue. This does not reflect the reevaluation of the completion of the issues being conducted by USEC at the Portsmouth facility.

(b) * indicates that the issue was completed between October 1, 1997, and September 30, 1998.

(c) Dates provided are completion dates committed to by USEC.

(d) Status as of September 30, 1998.

COMPLIANCE PLAN

ISSUES COMMON TO BOTH PADUCAH AND PORTSMOUTH (continued)

Issues	Status	
	Paducah	Portsmouth
Procedures Program[2]	3/3/2002	3/3/2002
Quality Assurance Program Implementation	*Complete	*Complete
Emergency Plan Support Documents	Complete	Complete
Quality Control Program for Low-Level Waste Disposal	Complete	Complete
Depleted Uranium Management Plan	*Complete	Complete
Decommissioning Funding Program	*Complete	*Complete
Chemical Safety Mechanical Integrity Program	Complete	Complete
HEPA Filter Systems Testing	Complete	Complete
Administrative Controls on Overtime	Complete	Complete
DOE Chemical Safety and Third Party Use of Hazardous Chemicals	Complete	Complete
Operational/Safety System Trip Redundancy	*Complete	Complete
Codes and Standards	Complete	Complete
UF_6 Leak Detector Sensitivity Testing	*Complete	Complete
Criticality Accident Alarms for Nearby Buildings	12/15/98	*Complete
Materials Control and Accountability Manuals and Procedures	Complete	*Complete
Receipts Based on Measured Values	Complete	12/31/98
DOE Materials Stored in Leased Space	Complete	Complete

ISSUES SPECIFIC TO PADUCAH

Issues	Status
C-360 Crane Upgrades	Complete
Criticality Accident Alarm System Coverage	Complete
Radioactive Calibration Source Accuracy	Complete
Fire Alarm System Reliability	Complete

---

[2] All new or updated procedures were issued by December 31, 1997, for Paducah and Portsmouth. Procedures that are designated as "in-hand" or that involve liquid uranium hexafluoride handling activities must be reviewed by the Plant Operations Review Committee (PORC) by March 3, 2002, if PORC did not review them as part of the upgrade program.

ISSUES SPECIFIC TO PADUCAH (continued)

Issues	Status
Fire Protection Water System Reliability	Complete
Fire Protection Equipment	Complete
Fire Protection Pre-Fire Plans	Complete
Public Warning Sirens and Controls	Complete
Public Address System	Complete
Training for Emergency Response Organization	Complete
Seismic Capability of Buildings C-331 and C-335	6/30/99
Environmental Trending Procedures	Complete
High-Volume Ambient Air Samplers	Complete
Criticality Accident Alarm System - Horn Audibility	12/15/98
Cascade Cell Trip Function Requirements	Complete
Measurement Systems	Complete
Inventory Program for Uranium Holdup	Complete

ISSUES SPECIFIC TO PORTSMOUTH

Issues	Status
X-705 Evaporator Heat Exchanger Modifications	Complete
X-705 Isolation Valve Testing	Complete
X-705 Microfiltration Influent pH Shutdown System Replacement	Complete
Nuclear Criticality Safety Training for Managers	Complete
Fire Protection Compensatory Measures	Complete
Fire Protection Sprinkler Testing	Complete
Emergency Packets	Complete
Assessments	Complete
Training for Emergency Preparedness	Complete
Possession of Uranium Enriched to Greater Than 10% U235	1/31/99

APPENDIX C

AMENDMENTS TO CERTIFICATES OF COMPLIANCE

PADUCAH

Title	Submittal Date	Status	Compliance Plan Issue
Cascade Cell Trip Function	4/14/97	Issued	No
Buildings C-331 and C-335, Seismic Upgrades	4/23/97	Issued	Issue 36
Nuclear Criticality Safety Program Elements	6/16/97	Issued	No
Revise Safety Analysis Report Date	7/18/97	Superseded	Issue 2
Autoclave Upgrades/Low Instrument Air Pressure and Extended Downtime	8/11/97	Issued	Issue 3
Safety Analysis Report Upgrade Revision	8/18/97 10/31/97	In Progress	Issue 2
Closure of C-360 Autoclave Isolation Valves Following UF_6 Detection	8/29/97	Issued	No
Product and Tails Withdrawal CAAS	9/15/97	In Progress	No
Provide Cross Reference Between CAAS TSRs	10/6/97	Issued	No
Condition for Chapter 3 Upgrade	3/30/98	In Progress	No
Crane Design Features	4/24/98	In Progress	No
Add New CAAS Cluster	5/13/98	Published	No
CAAS for C-710, C-720	5/27/98	Published	No
Autoclave Manual Isolation System	5/29/98	Published	No
Nonnetex Pump Safety Limit	9/11/98	In Progress	No

AMENDMENTS TO CERTIFICATES OF COMPLIANCE

PORTSMOUTH

Title	Submittal Date	Status	Compliance Plan Issue
Additional Hypothetical Criticality Case for X-333	2/13/97	Issued	No
Deletion of Seal Exhaust Pump Overflows in Buildings X-330 and X-333	5/6/97	In Progress	No
Autoclave Containment Valve Pressure Decay Testing	6/9/97	Issued	Issue 3
Nuclear Criticality Safety Program Elements	6/16/97	Issued	No
Autoclave Upgrades	7/1/97	Issued	Issue 3
Revise Safety Analysis Report Date	7/18/97	Superseded	Issue 2
Autoclave Smoke Detection System	7/30/97	Issued	No
Safety Analysis Report Upgrade Revision	8/18/97 10/31/97	In Progress	Issue 2
M&TE QA Clarification	10/21/97	Issued	Issue
HEU Cylinder Valve Replacement	2/3/98	Issued	Issue A4
TSR 2.8, CAAS	2/27/98	Issued	No
Freon Degrader	3/16/98	Published	No
Condition for Chapter 3 Upgrade	3/30/98	In Progress	No
X-342/344 Sprinkler System	4/30/98	In Progress	No
Low Cylinder Pressure Shut Off	5/26/98	In Progress	No
X-744H CAAS Coverage	6/11/98	Issued	Issue 11

Title	Submittal Date	Status	Compliance Plan Issue
Statistical Sampling of Russian Cylinder	8/7/98	In Progress	Issue 2
Receiving Cylinder Fill Weights	8/24/98	In Progress	No