



January 07, 2008
GDP 08-0001

Mr. Michael F. Weber
Director, Office of Nuclear Material Safety and Safeguards
Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

**Portsmouth Gaseous Diffusion Plant (PORTS)
Docket No. 70-7002, Certificate No. GDP-2
Certificate Amendment Request – Revision of X-326 Cell Treatment Monitoring
Technical Safety Requirement and HEU/MEU Deposit Removal Project**

Dear Mr. Weber:

In accordance with 10 CFR 76.45, the United States Enrichment Corporation (USEC) hereby submits a request for amendment to the Certificate of Compliance for the Portsmouth Gaseous Diffusion Plant (PORTS). This Certificate Amendment Request (CAR) proposes to revise X-326 Technical Safety Requirement (TSR) 2.7.3.5, Cell Treatment Monitoring and Safety Analysis Report (SAR) sections 3.1.1.12, 3.1.2.1, 3.1.2.2.2, 3.2, 3.2.3, and 3.7.

As part of the Cold Shutdown activities, the Department of Energy (DOE) has contracted with USEC to remove residual deposits of HEU and MEU from the X-326 Cascade Building that are currently held up in installed equipment. These deposits were left following DOE's initial removal of legacy HEU and MEU holdup material as part of the DOE HEU suspension project. Deposit removal will be conducted by in situ static chemical treatment of cells and other cascade equipment with the subsequent down blending to LEU as basically described currently in SAR section 3.7, HEU and MEU Activities.

Enclosure 1 contains the Oath and Affirmation. Enclosure 2 to this letter provides a detailed description and justification of the proposed changes. Enclosure 3 is a copy of the revised TSR and SAR pages associated with this request for NRC approval. Enclosure 3 may also contain changes which have been evaluated in accordance with 10 CFR 76.68 and determined not to require NRC approval. Enclosure 4 contains the basis for USEC's determination that the proposed changes associated with the CAR are not significant.

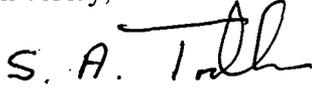
To support the current DOE HEU Deposit Removal Project schedule, USEC requests approval of this CAR by May 1, 2008. The amendment should become effective within 60 days of issuance.

NM5501

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There are no new commitments contained in this submittal. Any questions related to this submittal should be directed to me at (301) 564-3250.

Sincerely,

Handwritten signature of Steven A. Toelle in black ink.

Steven A. Toelle
Director, Regulatory Affairs

- Enclosures:
1. Oath and Affirmation.
 2. United States Enrichment Corporation (USEC), Certificate Amendment Request, Revision of X-326 Cell Treatment Monitoring Technical Safety Requirement and HEU/MEU Deposit Removal Project, Description and Justification of Changes.
 3. Certificate Amendment Request, Portsmouth Gaseous Diffusion Plant, Letter GDP 08-0001, Removal/Insertion Instructions.
 4. United States Enrichment Corporation (USEC), Certificate Amendment Request, Revision of X-326 Cell Treatment Monitoring Technical Safety Requirement and HEU/MEU Deposit Removal Project, Significance Determination.

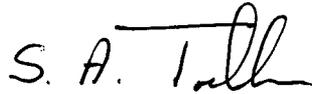
cc: D. Hartland, Sr. Fuel Facility Inspector, NRC Region II
J. Henson, Chief, Fuel Facility Branch 2, NRC Region II
M. Raddatz, NRC Project Manager, NRC HQ

Enclosure 1
GDP 08-0001

Oath and Affirmation

OATH AND AFFIRMATION

I, Steven A. Toelle, swear and affirm that I am the Director, Regulatory Affairs of the United States Enrichment Corporation (USEC), that I am authorized by USEC to sign and file with the Nuclear Regulatory Commission this Certificate Amendment Request for the Portsmouth Gaseous Diffusion Plant addressing the revision to the X-326 Cell Treatment Monitoring Technical Safety Requirement and HEU/MEU Deposit Removal Project as described in USEC letter GDP 08-0001, that I am familiar with the contents thereof, and that the statements made and matters set forth therein are true and correct to the best of my knowledge, information and belief.



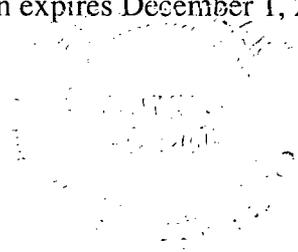
Steven A. Toelle

On this 7th day of January 2008, the individual signing above personally appeared before me, is known by me to be the person whose name is subscribed to within the instrument, and acknowledged that he executed the same for the purposes therein contained.

In witness hereof I hereunto set my hand and official seal.



Rita Peak, Notary Public
State of Maryland, Montgomery County
My commission expires December 1, 2009



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Description of Changes

As part of the Cold Shutdown activities, DOE has contracted with USEC to remove residual deposits of HEU and MEU material from the X-326 Process Building that is held up in installed but shutdown cells and equipment associated with the DOE HEU Suspension Project. Similar to the method described currently in SAR 3.7, HEU and MEU Activities, paragraphs 3 and 4, the removal of deposits will be conducted by in situ static chemical treatments after which the generated UF₆ (HEU and MEU) and associated treatment gases will be transferred by direct piping to holding drums. The UF₆ and treatment gases will then be bled back to the operating cascade where there is near instantaneous enrichment blend down to LEU by the interstage flow. After the cascade sufficiently separates the oxidant gases from the LEU UF₆, the UF₆ will be withdrawn into 12-inch cylinders that have been cooled in refrigeration chambers located in the Product Withdrawal (PW) area of X-326. The principle difference between what is currently described in SAR 3.7 and the proposed changes is the fact that this DOE funded project is not part of normal operations and represents a more significant level of effort than that indicated in the SAR.

TSR 2.7.3.5, Cell Treatment Monitoring, requires that an Infrared Analyzer be connected to the cell under going treatment. Due to the deposit removal schedule as requested by DOE numerous cells will be under treatment at the same time. Based on the reduced risk associated with the use of the Long Term Low Temperature (LTLT) static chemical treatment process as described in SAR 3.1.1.12 it is proposed that an IR analyzer only be connected to the cell for the first 24 hours of treatment. Subsequent treatment monitoring would occur daily utilizing individual cell samples taken to a centrally located Infrared Analyzer for analysis.

The following specific SAR and TSR changes are provided for approval to reflect the above project.

SAR 3.1.1.12, Cascade Equipment Chemical Treatment, 1st paragraph, 4th sentence is revised as follows:

“Chemical treatment for deposit removal can be conducted on cascade equipment that is operating (a running treatment) or on equipment that is shutdown (a static treatment)”

SAR 3.1.1.12, Cascade Equipment Chemical Treatment, 1st paragraph, 5th sentence is revised as follows:

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The word “recover” is changed to “**purify**”

SAR 3.1.1.12, Cascade Equipment Chemical Treatment, 1st paragraph, last sentence is revised as follows:

“The procedural controls for **all methods of** cascade equipment chemical treatments are described below.”

SAR 3.1.1.12, Cascade Equipment Chemical Treatment, 2nd paragraph, 1st and 2nd sentences are revised as follows:

The word “types” is replaced with “**methods**”

SAR 3.1.1.12, Static Cascade Equipment Treatments (including LTLT)-Procedural Controls, 1st paragraph, 6th bullet is revised as follows:

“No additional treatment gas is added to the cell (or equipment) after the initial charging of the cell is completed **during the LTLT treatment duration.**”

SAR 3.1.1.12, Static Cascade Equipment Treatments (including LTLT)-Procedural Controls, 1st paragraph, 9th bullet is revised as follows:

“After the initial treatment monitoring period, an operator will monitor the cell (or equipment) temperatures, pressures, at least once each shift **and sample the cell gas contents for analysis with an Infrared Analyzer once per day** to verify that free ClF₃ is present and that no unexpected reactions are occurring.”

SAR 3.1.2, Purge Cascade System, between 1st and 2nd paragraphs the following new paragraph is inserted:

“**The UF₆ (HEU and MEU) generated by the HEU Deposit Removal treatment process remains fully contained in the process equipment and cannot be safely removed until separated from the oxidant gases. The treatment gases are sampled in the cells or in holding drums for UF₆ concentration and enrichment and oxidant gas concentrations; based on the concentrations found, the treatment gases are bled to the cascade (X-25-7 or X-27-1) at a controlled rate to allow for enrichment reduction, separation and recovery of the UF₆ and for the controlled processing and disposal of**

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the treatment gases and other reaction products. The first step is the near instantaneous enrichment blend down of enrichment and reduction of oxidant concentration by the interstage flow where the treatment gases are introduced into the cell compressors in the enrichment process equipment. Next, using the gaseous diffusion barrier over a few cells, the oxidant gases are separated from the UF₆ and concentrated for processing and purging by the purge cascade at a controlled rate. The separated LEU UF₆ is withdrawn as a small portion (25-75 pounds per day) of the interstage flow from the process equipment via dedicated headers to the PW area and withdrawn into small cylinders (12 inch diameter or smaller) placed in refrigeration chambers. The UF₆ (LEU) freezes out and any non condensables are returned to the enrichment process equipment. The product flow is sampled at PW each shift to confirm the enrichment values; a 12 inch cylinder will be filled every 7-10 days.”

SAR 3.1.2, Purge Cascade System, 7th paragraph, 1st sentence is revised as follows:

“Additional components have been added to the Top Purge Cascade to handle larger accumulations of contaminants in the concentration gradients, the blend down of HEU recovered from deposits by chemical treatment and the withdrawal of LEU enriched uranium product.”

SAR 3.1.2.2.2, 4th paragraph, added new last sentence:

“For withdrawal of LEU from the X-326 deposit (HEU and MEU) removal, a jumper line connects the PW return/vent headers to the Side Purge Supply header.”

SAR 3.1.2.2.2, 5th paragraph, added new last sentence:

“For withdrawal of LEU from the X-326 deposit (HEU and MEU) removal, a jumper line connects the PW supply header to the Side Purge Return header.”

SAR 3.2, 8th paragraph, last sentence is revised as follows:

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“The ERP and PW facilities may be used for side feed and withdrawal operations to support cascade equipment deposit removal activities **(including HEU deposit removal as described in SAR section 3.7)** and X-340 operations (including UF₆ material transfer for repackaging).”

SAR 3.2.3, 2nd paragraph, is revised as follows:

“The Product Withdrawal (PW) is a fixed facility located in the southwest corner of the X-326 Process Building that is used to withdraw (LEU) product. The UF₆ can be removed from the cascade by routing it through headers from the desired cell/stage to a withdrawal manifold and a series of cylinder **withdrawal positions** within the PW facility. Presently, the PW headers, **a series of chilled withdrawal positions** and the approved **feed** (UF₆ sublimation) positions are used within the PW facility.”

SAR 3.2.3, between the 2nd and 3rd paragraphs the following 4 new paragraphs are inserted:

“The withdrawal system in PW is a set of three refrigeration chambers. Each chamber may contain a 12-inch diameter cylinder. A minimum of one refrigeration chamber with a 12-inch cylinder must be operable to support withdrawal operations; however, withdrawals can be stopped at any time without significant operating concerns other than eventually shutting off the UF₆ feed and treatment gas bleed. The PW withdrawal distribution system will allow any of the refrigeration chamber cylinders to be connected to the withdrawal header feed using the withdrawal chamber header piping. Cylinder pressure will be below atmospheric pressure at all times with flow provided by the differential pressure from the compressor discharge of the withdrawal location to the compressor suction pressure at the cascade return location. The gas temperature will be 90-120 °F with pressures from 2-7 psia and the refrigeration chambers will be operated in the range of 0-25 °F with exit pressures of 0-3 psia. The oxidant partial pressures after dilution by the interstage flow are such that the oxidants and reaction products will not liquefy in the 12-inch cylinders at the refrigeration chamber operating temperatures and pressures. The non-condensed gases will return to the cascade interstage flow. The withdrawal positions and the distribution system are operated from the local control panel.”

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The withdrawal system is designed to solidify gaseous UF_6 inside of the chilled withdrawal cylinders. The withdrawal chambers are designed and operated in a manner that minimizes the potential for overfilling the cylinder with UF_6 . The process is such that the cylinder fill rate is slow (25-75 lbs. per day) and the configuration of the withdrawal chambers is such that a cylinder scale is part of the chamber design. Operations checks the withdrawal cylinder weight(s) using the withdrawal position scale at least once per shift.

Also, the withdrawal position chambers have defrost controls that limit the defrost cycle such that cylinder temperatures will not reach levels that would cause a rupture. The defrost controls limit the refrigerant temperature to an approximate maximum value of 135° F. The maximum refrigerant temperature is seen as it exits the compressor and enters the withdrawal chamber well. The defrost controls monitor refrigerant temperature as it exits the withdrawal chamber well and enters the compressor, stopping the defrost cycle when the refrigerant reaches approximately 50° F.

The cell treatment material is bled to the cascade at a controlled rate and thus the oxidants are diluted to low concentrations by the interstage flow at the withdrawal location(s) prior to being sent to the withdrawal positions in PW. This prevents any potential liquefaction of ClF_3 or other reaction products in the withdrawal cylinder and maintains the oxidant concentrations well below those that could react explosively with cell coolant. Experience in operating the X-25-7 isotopic and purge equipment is that there are no significant coolant concentration levels. The cascade equipment separates the intermediate and light gases from the UF_6 and the rate of oxidant addition to the cascade is controlled to prevent the maximum concentration of ClF_3 from exceeding 16% at any location in the cascade. Thus, the potential for an exothermic reaction remains acceptable within the existing TSR controls on oxidant addition.”

SAR 3.7, between the 4th and 5th paragraphs the following 6 new paragraphs are inserted:

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“In addition to the above activities, as part of the Cold Shutdown activities, DOE has contracted with USEC to remove residual deposits of HEU and MEU from the X-326 Process Building that is held up in equipment subsequent to the DOE HEU cleanout performed as part of the HEU suspension project. This removal of deposits will be conducted by in situ treatment of cells and other cascade equipment with oxidant gases to remove deposits of uranyl fluoride and other uranium compounds from the cascade equipment surfaces in a manner described in SAR Section 3.1.1.12. These deposits have been determined by DOE and NRC to be in an “inaccessible” condition and thus are not counted against the allowable USEC possession limits described in the SAR Chapter 1. The use of in-situ chemical treatments will maintain the HEU and MEU material in an inaccessible condition inside the process equipment. Each treatment will recover from a few hundred grams to 30 kilograms of uranium as UF₆ from deposits; the grams of U-235 in the UF₆ gas will range from a few hundred grams (at very high enrichments) up to 6 kilograms (at an enrichment of 20% U-235).

The UF₆ (HEU and MEU) generated by the treatment process must remain fully contained in the process equipment and cannot be safely withdrawn until separated from the oxidant gases. The treatment gases are sampled in the cells or in holding drums for UF₆ concentration and enrichment and oxidant gas concentrations; based on the concentrations found, the treatment gases are bled to the cascade at a controlled rate to allow for enrichment reduction, separation and recovery of the UF₆ and for the controlled processing and disposal of the treatment gases and other reaction products. The first step is the near instantaneous enrichment blend down by the interstage flow where the treatment gases are introduced into the cell compressors, in the enrichment process equipment. Next, using the gaseous diffusion barrier over a few cells, the oxidant gases are separated from the UF₆ and concentrated for processing and purging from the cascade at a controlled rate. The separated LEU UF₆ is withdrawn as a small portion (25-75 pounds per day) of the interstage flow from the process equipment via dedicated headers to the PW area and withdrawn into small cylinders (12 inch diameter or smaller) placed in refrigeration chambers. The UF₆

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(LEU) freezes out and any non-condensables are returned to the enrichment process equipment. The product flow is sampled at PW each shift to confirm the enrichment values; a 12 inch cylinder will be filled every 7-10 days.

The withdrawal system in PW is a set of three refrigeration chambers. Each chamber may contain a 12-inch diameter cylinder. A minimum of one refrigeration chamber with a 12-inch cylinder must be operable to support withdrawal operations; however, withdrawals can be stopped at any time without significant operating concerns other than eventually shutting off the UF₆ feed and treatment gas bleed. The PW withdrawal distribution system will allow any of the refrigeration chamber cylinders to be connected to the withdrawal header feed using the withdrawal chamber header piping. Cylinder pressure will be below atmospheric pressure at all times with flow provided by the differential pressure from the compressor discharge of the withdrawal location to the compressor suction pressure at the cascade return location. The gas temperature will be 90-120 °F with pressures from 2-7 psia and the refrigeration chambers will be operated in the range of 0-25 °F with exit pressures of 0-3 psia. The dilution by the interstage flow will reduce the oxidant concentrations to a level where they will not liquefy in the 12-inch withdrawal cylinders at the refrigeration chamber operating temperatures and pressures. The non-condensed gases will return to the cascade interstage flow. The refrigeration chambers and the distribution system are operated from the local control panel.

The withdrawal system is designed to solidify gaseous UF₆ inside of the chilled withdrawal cylinders. The withdrawal chambers are designed and operated in a manner that minimizes the potential for overfilling the cylinder with UF₆. The process is such that the cylinder fill rate is slow (25-75 lbs. per day) and the configuration of the withdrawal chambers is such that a cylinder scale is part of the chamber design. Operations checks the withdrawal cylinder weight(s) using the withdrawal position scale at least once per shift. Also, the withdrawal chambers have defrost controls that limit the defrost cycle such that cylinder temperatures will not reach levels that would cause a rupture. The defrost controls limit the refrigerant temperature to an approximate maximum value of 135° F. The maximum refrigerant temperature is seen as it exits the compressor and enters the

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withdrawal chamber well. The defrost controls monitor refrigerant temperature as it exits the well and enters the compressor, stopping the defrost cycle when the refrigerant reaches approximately 50° F.

The cell treatment material is bled to the cascade at a controlled rate and thus the oxidants are diluted to low concentrations by the interstage flow at the withdrawal location(s) prior to being sent to the withdrawal positions in PW. This prevents any potential liquefaction of ClF₃ or other reaction products in the withdrawal cylinders and maintains the oxidant concentrations well below those that could react explosively with cell coolant. Experience in operating the X-25-7 isotopic and purge equipment is that there are no significant coolant concentration levels. The cascade equipment separates the intermediate and light gases from the UF₆ and the rate of oxidant addition to the cascade is controlled to prevent the maximum concentration of ClF₃ from exceeding 16% at any location in the cascade. Thus, the potential for an exothermic reaction remains acceptable within the existing TSR controls on oxidant addition.

The process described above will ensure that the blended stream remains within the ²³⁵U possession limits defined in Table 1-3. Any changes in uranium inventory due to “recovery” of the small amounts of HEU during an inventory period would be reflected in USEC’s enrichment cascade Inventory Difference (ID) during periodic inventories. After treatment on a cell (or other cascade equipment) is completed, a new baseline holdup NDA measurement will be made.”

TSR 2.7.3.5, Cell Treatment Monitoring, Actions, Condition A, is revised as follows:

“Infrared Analyzer inoperable during running cell treatment or during first 24 hours of static (LTLT) cell treatment”

TSR 2.7.3.5, Cell Treatment Monitoring, Surveillance reference number corrected as follows:

“SR 2.7.3.5.1”

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TSR 2.7.3.5, Cell Treatment Monitoring, Surveillance, the following new surveillance is added:

Frequency	Surveillance
Once per day during LTLT or Static Cell Treatment	SR 2.7.3.5.2 Collect sample from cell and analyze using Infrared Analyzer

TSR 2.7.3.5, Cell Treatment Monitoring, Basis, add the following paragraph before the existing paragraph:

“Deposit removal can be conducted on cascade equipment that is operating or on equipment that is shutdown. The rate of oxidant gas consumption, especially ClF_3 , is dependant on whether the treatment being performed is a running or static treatment. In either type of treatment, the treatment gas mixture is monitored to assure that no hydrocarbons or fluorocarbons are present and that free ClF_3 is always present to prevent the formation of ClO_2 and Cl_2 which can damage cascade equipment and can pose hazards during subsequent processing to recover UF_6 recovered by the chemical treatments. A specialized type of static chemical treatment, called Long-Term, Low-Temperature (LTLT), is used for shutdown equipment.”

TSR 2.7.3.5, Cell Treatment Monitoring, Basis, add the following to the beginning of the existing paragraph:

“During cell treatments with process equipment running,”

TSR 2.7.3.5, Cell Treatment Monitoring, Basis, add the following paragraph after the existing paragraph:

“Static cascade equipment treatments are those performed where the cell (or other cascade equipment) is not running. Higher concentrations of oxidant gases are used and the pressure of the cell (or equipment) is maintained below atmospheric pressure. Because of the lower temperatures, absence of running equipment and additional measures to prevent the presence of coolant, static (LTLT) cell treatments do not progress rapidly or have the potential for rapid changes of conditions that

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could result in an exothermic or explosive reaction. Operator presence and frequent monitoring of the cell temperatures, pressures and infrared monitor readings occur during the initial addition of treatment gas increments and for twenty four hours after the last increment is added. After the initial treatment monitoring period, an operator will monitor the cell (or equipment) temperatures, pressures at least once each shift and will collect a gas sample from the cell at least once every day to verify that free ClF_3 is present and that no unexpected reactions are occurring."

Justification of Changes

HEU/MEU Deposit Removal

The proposed change to the NRC Certificate Application, primarily SAR 3.7, is a revision to describe the HEU/MEU deposit removal process and activities, particularly the use of the enrichment cascade to blend down the enrichment to commercial grade levels (4.5-4.95% enrichment) and to withdraw this material as LEU product at the X-326 Product Withdrawal (PW) area. The deposit removal effort will utilize equipment, processes and activities that have been performed previously under NRC regulation but not as a concerted effort to remove HEU/MEU material from installed cascade equipment.

NRC has regulatory jurisdiction over all diffuse and inaccessible uranium enriched to \geq than 10 weight percent ^{235}U remaining in installed equipment in USEC leased certified areas and which remains inaccessible. The NRC Compliance Evaluation Report (CER), Holdup of Uranium Enriched to Greater Than or Equal to 10 Weight Percent ^{235}U in Process Equipment, concluded that USEC had adequately demonstrated that the HEU/MEU holdup in installed cascade equipment was inaccessible and that controls in place along with Certificate Condition 17 were sufficient to ensure the protection of the material. The proposed method of HEU/MEU deposit removal still maintains the HEU/MEU inaccessible inside the process equipment until after it is blended down to LEU in the X-25-7 cells at which time LEU would be withdrawn. The same security and operations monitoring to detect unauthorized activities and/or utilization of process equipment plus the inherent physical access restraints of the cascade will continue to remain. The conversion of HEU/MEU material from a solid to a gas phase does not increase the accessibility of the material due to the fact that the recovered UF_6 is mixed with highly hazardous chemicals (ClF_3 and F_2) and can not be safely removed from the

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cascade without the unauthorized utilization of existing process equipment and processes. Required samples of the treatment gases containing small concentrations of HEU/MEU will remain within the existing Certificate possession limits. Thus the HEU/MEU deposit removal activity remains within the existing Certificate restraints regarding the presence of HEU/MEU material. The interstage process flow cannot be interrupted without shutdown of the enrichment equipment. Since the compressor suction provides the vacuum source for transfer of the cell treatment gases from the holding drums, the flow of treatment gas to the cell will stop if the cell equipment stops. Similarly, the inventory of LEU in the enrichment equipment as supplied through a side feed will be approximately 20 times the amount of HEU being bled to the cascade in any week; thus a loss of feed unnoticed and uncorrected for one week would only raise the enrichment of any potential withdrawal up to 10 %. In addition, such a loss of feed would prevent withdrawal due to loss of cell inventory and pressure within a couple of days and the associated cascade motor load reduction would be noticed very quickly by operating personnel.

The X-326 cells containing the HEU/MEU and associated building piping were originally designed to be nuclear criticality safe for the processing of HEU/MEU as UF_6 gas and the conversion of solid deposits to gaseous UF_6 in a fluorinating environment will still maintain the HEU/MEU within the existing NCS analyses for such material and equipment. Transfer of the material to Unit X-25-7 is also analyzed to be safe for movement and processing of HEU/MEU. Upon entry into the cascade the HEU/MEU material will be instantaneously blended down to LEU in the interstage flow. The PW feed and return lines utilized in the withdrawal process were also designed and operated for withdrawal of HEU/MEU and have a large NCS margin for the withdrawal of nominal 5% enriched material. The 12-inch cylinders are authorized for shipment of 5% material and NCS analyses have determined that they would be subcritical up to an enrichment of 15%.

There will be no significant concentrations of oxidant gases at the withdrawal location since these gases move up to the purge cells due to their molecular weight being significantly lower than the UF_6 . Thus, concentration of oxidants at the withdrawal location will be less than 1% by volume and the oxidants will not condense in the withdrawal cylinders since the partial pressures are well below the liquefaction point.

The concentrations in all locations in X-25-7 will be maintained lower than 16 mole% using existing TSR 2.7.3.7 and associated procedural controls on disposal of oxidant through the purge cascade.

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Certificate of Compliance Condition #17 addresses the surveillance requirements and measured holdup quantities of HEU/MEU associated with the Caretaker Project. HEU/MEU holdup material in installed equipment resulting from legacy DOE operations is the responsibility of DOE. As part of the Caretaker Project, every two years, DOE requires USEC to perform NDA measurements of specified shutdown equipment in X-326 to confirm the continued presence of the DOE owned material in

USEC leased and NRC certified installed equipment. USEC intends to comply with Condition #17 in the following manner. Upon completion of a Caretaker Project cell's chemical treatment, the cell will be measured (NDA) to determine its current holdup of material. If the resultant measurement is outside the measuring instrument's accuracy range USEC will inform NRC within the specified 15 days of the change and USEC's assessment of the difference. Assuming the change is attributed to the chemical treatment effort USEC will establish a new baseline value for the cell and initiate a new two year measurement frequency. For those Caretaker Project cells not under going chemical treatment they will continue to be measured according to their current schedule.

TSR 2.7.3.5, Cell Treatment Monitoring

The SAR does not contain any specific accident scenarios for cell treatment processes. The consequences of various postulated reaction accidents associated with oxidant gas reactions did not exceed the SAR Evaluation Guidelines (EGs) and therefore the scenarios did not require analysis beyond the PrHA/PSOA process. The Safety Analysis Report Upgrade (SARUP) effort while supportive of the preceding conclusion still maintained cell treatment TSRs established during plant certification. These initial cell treatment TSRs were developed at a time when the method of cell treatment was predicated on the operation of the cell compressors (running cell treatments). Since that time, driven partially by the 2001 shutdown of the "enrichment" cascade, Long-Term, Low-Temperature (LTLT) static chemical treatments, which have a significantly reduced potential for an exothermic reaction are being used to successfully remove deposits.

LTLT treatments are applied to cells in a shutdown state which have no stage compressors operating. The cell coolant systems are drained and evacuated for safety purposes as specified in TSR 2.7.3.4. The cell lube oil systems are drained and isolated. Dresser seals are installed on the compressors to minimize wet air leakage and as an added assurance against out leakage. In addition, the LTLT treatment method involves

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lower temperatures and lower rate of consumption of oxidants than associated with running cell treatments. LTLT reactions proceed very slowly due to their low temperature and operating experience has shown that the ClF_3 concentration drops about 30% over the first few days and then an additional 10-20% over the next 30-60 days. ClF_3 concentrations have not been detected at less than 5 mole%. Fluorine concentrations remain relatively constant after the initial reaction stabilization period. The potential for the development of an exothermic reaction is significantly reduced due to the above actions that limit the availability of potential reactants (coolant, oil, wet air) and all but eliminates the potential for an ignition source (rotating equipment).

Due to the inherent nature of the LTLT treatment process, as described above, to assure the continued presence of ClF_3 continuous monitoring by an Infrared Analyzer (IR) is not warranted. During the initial addition of treatment gases the operator is present to monitor temperatures, pressures and IR analyses. The operator continues to monitor the cell frequently for the first 24 hours after the completion of treatment gas additions to ensure there is no unforeseen depletion of ClF_3 or that in fact the coolant has not been drained, etc. After the initial 24 hour monitoring period in which it has been demonstrated that the cell reaction is stabilized daily monitoring of the cell reaction is adequate for verifying that the ClF_3 has not been depleted. As noted earlier, experience has shown that a relatively constant concentration of fluorine is maintained and, of course, the recovered UF_6 is also present; the presence of these compounds will also prevent the formation of reaction products that would potentially result in highly exothermic reactions upon re-introduction of ClF_3/F_2 .

Certificate Amendment Request Portsmouth Gaseous Diffusion Plant Letter GDP 08-0001 Removal/Insertion Instructions	
Remove Pages	Insert Pages
APPLICATION FOR UNITED STATES NUCLEAR REGULATORY COMMISSION CERTIFICATION SAFETY ANALYSIS REPORT VOLUME 1	
SAR Section 3.1 Pages 3.1-58,59,59b,61,62,63	SAR Section 3.1 Pages 3.1-58,59,59b,61,61a,61b,62,63
SAR Section 3.2 Pages 3.2-1a,59,60	SAR Section 3.2 Pages 3.2-1a,59,60
SAR Section 3.7 Pages 3.7-1	SAR Section 3.7 Pages 3.7-1,1a,1b
APPLICATION FOR UNITED STATES NUCLEAR REGULATORY COMMISSION CERTIFICATION TECHNICAL SAFETY REQUIREMENTS VOLUME 4	
TSR 2.7.3.5 Pages 2.7-10	TSR 2.7.3.5 Pages 2.7-10,10a

The alarm entries on the alarm typer indicate whether the detector is experiencing trouble or a valid alarm. The mimic panel is not operable when the detector system is in manual operating mode.

In normal operating mode, the CADP System will initiate a trouble alarm upon loss of power to the detectors.

In the manual operating mode, loss of power would be detected in the ACR by the loss of other monitored equipment, or at the local cell panel by the extinguished status lights on the signal conditioner, depending upon where the power failure occurred.

In both normal and manual operation, an individual detector alarm indicator light on the front of the signal conditioner is illuminated when a detector actuates.

In manual operating mode, a "smoke release" indicator lamp and an alarm horn located in the ACR actuate when an alarm condition occurs for any smoke detector in the unit.

3.1.1.11.3 Equipment Status Monitors (Uprated Cells Only)

Another parameter monitored by the CADP System is instrument and equipment status. This category is strictly an in-or-out-of-limit indication. It does not measure temperature or pressure. It is simply based on the parametrical setpoints established to indicate problems or failures of instrument, electrical, or process equipment in the process system. These points are coolant high temperature, outleakage signal condition status, and stage temperatures.

3.1.1.11.4 Operation

The signals emitted by the various CADP monitoring sensors described in this section are received by the unit processor associated with that unit.

It is at the unit processor that the signals for each sensor are received, checked against predetermined limits, and relayed to the CPU in X-300A. If the unit processor has generated an alarm request, the CPU prints the alarm on the terminals in the ACR and PCF.

The unit processor is located at the LCC on the operating floor. In X-333, the eight unit processors, one for each unit, are located at Cell 6. In X-330, the five unit processors, one for each unit of X-31-1 through X-31-5, are located at Cell 5 in each unit.

3.1.1.12 Cascade Equipment Chemical Treatment and Cascade Oxidant Control

Cascade Equipment Chemical Treatment

Removal of solid uranium compounds, primarily uranium oxy-fluorides, from cascade equipment may be accomplished by in-situ chemical treatments. The chemical treatment methods all utilize a mixture of oxidant gases (i.e. ClF_3 and F_2) with nitrogen added as a diluent to control the mixture reactivity and prevent undesirable chemical reactions. The amount (concentration) of the oxidant gases added to equipment depends on the type of treatment, the volume of the equipment to be treated and the amount of the deposit to be removed. Chemical treatment for deposit removal can be conducted on cascade equipment that is operating (a running treatment) or on equipment that is shutdown (a static treatment). The rate of oxidant gas consumption, especially ClF_3 , is dependant on whether the treatment being performed is a running or static treatment. In either type of treatment, the treatment gas mixture is monitored to assure that no

hydrocarbons or fluorocarbons are present and that free ClF_3 is always present to prevent the formation of ClO_2 and Cl_2 which can damage cascade equipment and can pose hazards during subsequent processing to purify UF_6 recovered by the chemical treatments. A specialized type of static chemical treatment, called Long-Term, Low-Temperature (LTLT), is used for shutdown equipment having large deposits. LTLT is a gas-phase in-situ method of treating cascade equipment having significant deposits. This method utilizes higher concentrations of oxidant gases, compared to running cell treatments, LTLT shot durations may last up to 120 days and are conducted at low temperatures (typically less than 100 °F). The procedural controls for all methods of cascade equipment chemical treatments are described below.

There are three basic methods of cascade equipment (cell) treatments: (1) running cell treatments, (2) inverse recycle running cell treatments, and (3) static cell treatments (e.g. Long-Term, Low-Temperature, LTLT, treatments). In order to prevent exothermic reactions/explosions, procedures control the following for all three methods of cascade equipment treatment:

- The introduction of nitrogen and limiting the amount of F_2/ClF_3 introduced into the cascade equipment to be treated.
- Removing liquid coolant and evacuating the Coolant System (when applicable) to limit the amount of coolant available for a reaction.
- Monitoring of the equipment being treated with an infrared analyzer or laboratory analysis of samples to detect hydrocarbons, coolant, or fluorocarbons, which would indicate a coolant or oil leak in the equipment.
- Monitoring of the equipment being treated with an infrared analyzer or laboratory analysis of samples to assure the presence of free ClF_3 to avoid the formation of more reactive compounds such as ClO_2 .

In addition, the following controls are applied to specific types of treatments.

Standard Running Cell Treatments – Procedural Controls

- Operator presence at the cell instrument panel and frequent monitoring of cell pressures and temperatures. The contents of cells in X-333 and X-330 are dumped to surge drums if compressor discharge temperatures reach the established setpoint. Cell treatment dump temperatures for cells in X-326 differ from those in X-333 and X-330 because of equipment and equipment configuration differences. The contents of the isotopic cells (Units X-27-1, -2, and X-25-7 odd) in X-326 are dumped to surge drums if the A-suction temperature or the stage 12 discharge temperature reaches (or exceeds) its setpoint. The contents of the low-speed purge cells (X-25-7-2, -4, -18, and -20) are dumped if the A-suction temperature reaches (or exceeds) its setpoint value. The contents of the high and intermediate-speed purge cells (X-25-7-6, -8, -10, -12, -14, and -16) are dumped if the A-suction temperature, the stage 1 discharge temperature, or the stage 6 discharge temperature reaches (or exceed) its setpoint.
- Frequent sampling and/or review of infrared monitoring data for the cell to assure the absence of hydrocarbons and fluorocarbons and the presence of free ClF_3 to avoid the formation of the more reactive compounds, such as ClO_2 .

- During the initial charging of the cell with treatment gas and for twenty four hours after the last increment is added, surge drum capacity is provided to allow for dumping of the shot if an unexpected reaction evidenced by monitoring of the cell (or equipment) should occur. After the initial period, surge drum capacity is maintained to allow for dumping of one out of every three ongoing LTLT treatments.
- No additional treatment gas is added to the cell (or equipment) after the initial charging of the cell is completed during the LTLT treatment duration.
- The ratio of ClF_3 to F_2 is maintained to that utilized for standard running cell treatments.
- The treatment gas concentration will be no more than five times that used in standard cell treatments.
- After the initial treatment monitoring period, an operator will monitor the cell (or equipment) temperatures, pressures, at least once each shift and sample the cell gas contents for analysis with an Infrared Analyzer once per day to verify that free ClF_3 is present and that no unexpected reactions are occurring.

Cascade Oxidant Control

In order to control the introduction of oxidants into the cascade, the F_2 and/or ClF_3 concentrations are maintained below prescribed levels. Experiments have shown that a mixture of coolant and F_2/ClF_3 at sufficient quantities in the presence of an ignition source will explode at cascade pressure. The maximum mole percent of oxidants is too low to be measured at any point in the cascade, except behind severe plugs and at the purge cascade cells and vent.

Since it is possible for a coolant leak to occur at any time in operating cascade equipment, it is not possible to assure control of the coolant concentration in the purge cascade. Thus, within the top purge cascade, oxidant concentrations are controlled by administratively controlling the addition of oxidants to the cascade. A safe bleed-back rate is calculated based on the cascade lights upflow and the contents of the surge drums or cell being planned for bleed-back to the cascade.

3.1.2 Purge Cascade System

3.1.2.1 System Description

The purge cascades are used to separate and remove low and intermediate molecular weight gases ("lights") from the cascade. These "light" gases usually consist of oxygen, nitrogen, cascade coolants, fluorine, and ClF_3 which have either leaked into the enrichment cascade or were introduced into the cascade via operating activities related to cell maintenance. Since these "lights" possess molecular weights lower than that of the UF_6 portion of the PG, they tend to concentrate in the upper stages of the purge and enrichment cascades, until vented, displacing the UF_6 PG to a position downstream of its desired location in the cascade. With the shutdown of enrichment operations, only the Top Purge is in operation supporting Tc Feed Cleanup and Deposit removal cascade activities.

The UF_6 (HEU and MEU) generated by the HEU Deposit Removal treatment process remains fully contained in the process equipment and cannot be safely removed until separated from the oxidant gases. The treatment gases are sampled in the cells or in holding drums for UF_6 concentration and enrichment and oxidant gas concentrations; based on the concentrations found, the treatment gases are bled to the cascade (X-25-7 or X-27-1) at a controlled rate to allow for enrichment reduction, separation and recovery of the UF_6 and for the controlled processing and disposal of the treatment gases and other reaction products. The first step is the near instantaneous enrichment blend down of enrichment and reduction of oxidant concentration by the interstage flow where the treatment gases are introduced into the cell compressors in the enrichment process equipment. Next, using the gaseous diffusion barrier over a few cells, the oxidant gases are separated from the UF_6 and concentrated for processing and purging by the purge cascade at a controlled rate. The separated LEU UF_6 is withdrawn as a small portion (25-75 pounds per day) of the interstage flow from the process equipment via dedicated headers to the PW area and withdrawn into small cylinders (12 inch diameter or smaller) placed in refrigeration chambers. The UF_6 (LEU) freezes out and any non condensables are returned to the enrichment process equipment. The product flow is sampled at PW each shift to confirm the enrichment values; a 12 inch cylinder will be filled every 7-10 days.

The purge cascade consists of isotopic cells, the Side Purge cells, the Top Purge cells, exhaust (booster) pumps, chemical traps, an atmospheric exhaust, and associated flow instrumentation and controls. The Side Purge is used to vent most of the "lights" introduced into the cascade. The Top Purge, including its associated isotopic cells, operates in conjunction with the Side Purge to separate and vent the heavier "lights" and other contaminants not removed by the Side Purge. Due to its lighter molecular weight with respect to UF_6 , the coolant introduced into the PG stream rapidly diffuses to the top of the cascade. However, the molecular weight of the coolant is greater than that of other lower molecular weight gases ("lights") present in the cascade; therefore, the coolant tends to form a "bubble" in the purge and isotopic cells of the Top Purge Cascade. These heavier "lights" include cascade coolants and various fluorinated compounds of metals such as technetium and molybdenum.

The purge cascade, located at the south end of X-326, comprises the top end of the enrichment cascade. The Side Purge cells normally receive flow from the top cell in Unit X-27-1 and return the flow back to the bottom cell in Unit X-27-2. The Side Purge is intended to remove approximately 90% of the "lights" and return the UF_6 and heavier "lights". The Top Purge cells normally receive flow from the top of Unit X-27-2, via the purge cascade isotopic cells, and return the UF_6 to the top cell in Unit X-27-2. The Top Purge is intended to vent the heavier "lights" and any residual "lights" not removed by the Side Purge.

The specially designed Side and Top Purge Cascade cells are the even numbered cells in Unit X-25-7. Each of these purge cells consists of six stages configured as individual Badger stages

(Figure 3.1-20), while the isotopic cells have 12 stages configured in Badger clusters. (See Section 3.1.1 for a description of Badger stages and clusters.) The control system and trip features of the lube oil, coolant, and individual stage process pressure systems are similar to those in the enrichment cascade cells (Section 3.1.1). Normally the gas stream is exhausted from the top cell of each purge cascade at less than one ppm UF₆. The Side Purge Cascade A-stream flow normally enters the middle of cell X-25-7-2 (or cell 4 if cell 2 is not on-stream) which creates the Side Purge stripper section, and proceeds through cells X-25-7-2, 4, 6, 8, and 10 (as available) and into the Side Purge Booster station. The Top Purge Cascade A-stream flow enters the odd-numbered isotopic cells of Unit X-25-7, then through purge cells X-25-7-20, 18, 16, 14, and 12 (as available), and into the Top Purge Booster station. Figure 3.1-21 shows the flows within the purge cascade.

The Booster stations are normally used to raise and control the pressure of the vent gas stream before entering a Metering station. The vent gas stream entering the Metering station is either processed through the chemical traps or recycled back to the purge cascade to stabilize the concentration gradient. This "Concentration Recycle" from the Metering station provides a means of maintaining a concentration of approximately 95% "lights" at the inlet to the first high-speed purge cascade cell. The flow that is not

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used as the Concentration Recycle is measured, and the purge rate to the atmosphere is controlled by other flow loops in the Metering station.

The chemical traps remove most of the residual UF_6 and other radionuclides remaining in the purge gas before it is vented to the atmosphere. The flow exiting the chemical traps is evacuated by the Atmospheric Exhauster station, which includes air ejectors. The combined flow of vent and air ejector gases is monitored by continuous samplers used to establish the environmental discharge values of these vents.

Additional components have been added to the Top Purge Cascade to handle larger accumulations of contaminants in the concentration gradients, the blend down of HEU recovered from deposits by chemical treatment and the withdrawal of LEU enriched uranium product. These components are the magnesium fluoride (MgF_2) trapping manifold, Product Withdrawal Supply and Return headers, Side Withdrawal (SW) Supply and Return headers, Top Purge Air Bleed station, and the Freon Degradator. The Top Purge Air Bleed station compensates for the reduction of "lights" inleakage previously originating from the HEU cascade and decreases the concentration of oxidant in the Top Purge. The function of a Freon Degradator system (basically, a side-stream reactor) is to react, in a controlled manner, the coolant with fluorine to produce lighter molecular weight gases, which can be more readily purged from the cascade.

The purge cascades use the Nitrogen, Plant Air, Fluorine, and Fire Protection systems in X-326 (Sections 3.4.3, 3.4.4, 3.4.7, and 3.6.1, respectively, for descriptions of these cascade support systems). The power source for the purge cascade stage motors, auxiliary systems, and emergency power are the same as for the enrichment cascade (Section 3.1.1). To assure the operation of the purge cascade cells, power to the high-speed cells is supplied by separate feed lines.

Designated valves and expansion joints and converters in the purge cascades are monitored periodically to detect buildup of UO_2F_2 deposits, indicated by increased gamma/neutron radiation readings. Deposits within compressors are identified by changes in operating characteristics. Buildup of deposits can also be detected by non-destructive analysis methods, including Operational neutron probe readings.

Purge cascade systems, structures, and components identified in Section 3.8 as being important to safety are described in Section 3.1.2.2. General facility safety support systems that are important to safety for X-326 (i.e., the CAAS, the Fire Protection System, and the UF_6 Release Detection System) are described in Section 3.1.1.

3.1.2.2 Equipment

The enrichment cascade description (Section 3.1.1.2) is applicable to similar components in the purge cascade, including: converters, compressors, motors, coolers, valves, piping, and the X-326 process building. Section 3.1.1.6 describes auxiliary cascade systems that support the purge cascade, including: Plant Air, electrical power, nitrogen supply, RCW, and fire protection. The purge cascade equipment descriptions in the following subsections focus on the differences between the purge cascade and enrichment cascade components.

The function of the UF_6 primary system in the purge cascade, which is identified in Section 3.8 as important to safety, is UF_6 containment. (See Section 3.1.1 for a description of the UF_6 primary system.) This function is similar to that of the smaller stages in the enrichment cascade (i.e., converters, compressors, coolers, expansion joints, valves, and piping), and applies to the Booster and Metering Stations, chemical traps, air ejectors, and the Freon Degradator system as well. Since the X-326 cells are

operated at sub-atmospheric pressures, minimizing the possibility of a UF₆ release if the purge cascade is breached, the equipment housing is not important to safety, per Section 3.8.

3.1.2.2.1 Stage Compressors

The compressors in the isotopic cascade cells are identical to those in Section 3.1.1 for the enrichment cascade in X-326. The compressors used in each stage of the purge cascade cells are two-stage centrifugal designs which combine the A-stream out of the stage below with the B-stream from the stage above to supply the stage converter via a single discharge nozzle. The compressors in the first two low-speed purge cascade cells are designed to normally handle high concentrations of UF₆ or heavier "lights". The other intermediate/high-speed purge cascade cells use specially designed centrifugal compressors, whose operating speeds vary with the gearing of the speed increasers, based on the average molecular weight of the gas being pumped.

3.1.2.2.2 Process Piping

The containment function of the UF₆ primary system, including expansion joints, and associated valves and piping containing UF₆, is important to safety as described in Section 3.8. The process piping directly related to flow within the purge cells and associated bypass piping are nickel-lined steel and sized based on original design flow and function of the equipment. Welds on the UF₆ primary system are pressure and vacuum leak tested to ensure that the leak-rate criteria specified in plant procedures are met.

The purge cascade contains two separate unit evacuation headers—one dedicated to the isotopic cells of the Top Purge and another used for the Top and Side Purge Cascade cells, Booster stations, and chemical traps.

The feed header connects alternating isotopic cells in the Top Purge Cascade (X-25-7-3, -7, -11, -15 & -19), and the Product Withdrawal's Side Withdrawal (SW) Supply header, to various headers in X-326's unit bypass system.

The Side Purge Supply header runs the entire length of X-326 and contains a normally isolated section of cell bypass piping, which can be used to connect the low-speed cells in the Top and Side Purges to enrichment cascade cells in Units X-27-1 or 27-2. The Side Purge Supply header normally connects the A-stream out of Unit X-27-1 with the A-stream entering the middle of cell X-25-7-2 or -4 in the Side Purge. For withdrawal of LEU from the X-326 deposit (HEU and MEU) removal, a jumper line connects the PW return/vent headers to the Side Purge Supply header.

The Side Purge Return header runs the entire length of X-326 and routes the B-stream flow out of the Side Purge to the A-stream of the first cell in Unit X-27-2, to supplement the number of cells in the isotopic section of the Top Purge Cascade. This header may be used to return the B-stream flow to the bottom stage in the isotopic section of the Top Purge Cascade. With the installation of the Top Purge Stripper section, the Side Purge Return header can also be used to supply the Stripper section of the Top Purge Cascade. The Side Purge Supply and Return headers can also be configured in several different flow paths for operation or maintenance of the purge cascades (Figure 3.1-22). For withdrawal of LEU from the X-326 deposit (HEU and MEU) removal, a jumper line connects the PW supply header to the Side Purge Return header.

Each purge cascade contains a Concentration Recycle header that connects the respective Metering station with various locations in the purge cascade. This recycled flow out of the Metering station is returned to the purge cascade before the high-speed cells. This flow is used by the Concentration Recycle control system to increase the interstage flow of "lights" going to the Concentration Recycle control system to increase the interstage flow of "lights" going to the purge cascade vent and stabilize concentration gradients within the purge cascade itself.

The uranium feed and withdrawal operations have been drastically curtailed due to the shutdown of enrichment operations. The X-343 and X-344A facilities are primarily utilized for the receipt, sampling, Tc reduction, transfer and shipping of uranium material. Both the X-343 and the X-342A may be used for material transfer and venting to the cascade equipment. The withdrawal facilities at Tails and LAW are in a shutdown condition. The ERP and PW facilities may be used for side feed and withdrawal operations to support cascade equipment deposit removal activities (including HEU deposit removal as described in SAR Section 3.7) and X-340 operations (including UF₆ material transfer for repackaging).

USEC has contracted with DOE to process near-normal enriched UF₆ contaminated with Tc-99 above ASTM Specification C-787-90 (Affected Inventory) contained in cylinders that, based on initial inspections, are not compliant with DOT shipping requirements and are designated "Non-Compliant Cylinders." These cylinders are shipped to PORTS under a DOT exemption. USEC has contracted with DOE to remove the UF₆ from the cylinders, process this material for reduction of Tc-99 to acceptable levels and to package the material in ANSI N14.1 compliant cylinders.

Since the enrichment process is shutdown, USEC will use existing cascade equipment and processes at the Portsmouth GDP (PORTS) to perform the required activities. Many of these cylinders meet PORTS inspection requirements (based on ANSI N14.1 and USEC-651) and are liquid-transferred and processed in X-344. For the majority of these cylinders, PORTS will use autoclaves in the X-342 and X-343 autoclaves to heat the impaired cylinders using both the normal and "controlled feed" mode of heating, as described in the TSRs, and feed the material to cascade equipment for withdrawal at the ERP Station into 10-ton ANSI N14.1 compliant cylinders.

The autoclaves in X-342 and X-343 that will be utilized for this process had been in service prior to shutdown of the enrichment process. The X-342 and X-343 autoclaves were utilized for providing feed to the cascade and will be used in the same manner for this project activity. However, the autoclaves to be used in X-342 and X-343 in the "Controlled Feed" mode for these cylinders in transferring the material to the cascade equipment are modified. The steam control system (a Non-Safety, NS, system) is modified to employ a new control system utilizing the cylinder surface temperature measurement as the control parameter. The new steam control system will replace one of the existing steam control systems and is designed to provide steam at a rate of approximately 10% of the existing steam control systems. The feed will be transferred using existing transfer lines (e.g., tie-lines) to the cascade equipment. In addition, these autoclaves will be used for heel evacuation and feed of some cylinders using normal heating settings.

The cascade will receive the feed into either drums or directly to operating cascade equipment. The overall feed rate will be approximately 1000 lb/hr (or less); this feed rate is 20% of the feed rate at PORTS GDP rated capacity.

The following sections describe in more detail the operations identified above.

The United States government intends to ship four cylinders of UF₆ to USEC for processing. These cylinders cannot be shown to meet the specifications required by the SAR and TSRs and the contents cannot be verified to meet the SAR requirements nor can the normal receipt verifications be performed as described in the FNMCP.

3.2.2.3.6.2 Plant Air Failure

Failure of the plant air system requires shutdown of the withdrawal facilities. During an air supply failure there would be time for an orderly shutdown and isolation. The compressor recycle valves would open protecting the compressors.

Over a prolonged outage, the condensers and accumulators can be drained and evacuated.

3.2.2.3.7 Fire Protection

The only significant combustible material contained in the withdrawal area is the lubrication oil used in the compressor and motor lubrication. There are no combustible materials used in the construction of this facility.

The greatest fire hazard to this facility is the large quantity of process lubricating oil used to lubricate the process motor and compressor bearing, which may leak into this facility. In such events, the oil is caught and/or cleaned up using procedural controls.

Portable fire extinguishers are located inside the building. The Tails withdrawal area is provided with wet-pipe automatic sprinkler systems.

3.2.3 Top Product and Side Withdrawals

Historically, via both permanent facilities and portable equipment, enriched UF₆ was withdrawn from any point in the enrichment cascade by freezing out the UF₆ to the walls of chilled cylinders. Within the permanent facilities and via portable equipment, the UF₆ was withdrawn into approved cylinders whose diameters varied based on the assay being withdrawn. The portable withdrawal unit used for these withdrawals consisted of a refrigeration unit and/or a cylinder bath to chill the walls of the cylinder and occasionally a scale. This same methodology could still be used to freeze out small quantities of UF₆ for laboratory standards from the individual cell control centers (LCC) into approved sample cylinders/withdrawal cylinders.

The Product Withdrawal (PW) is a fixed facility located in the southwest corner of the X-326, Process Building that is used to withdraw LEU product. The UF₆ can be removed from the cascade by routing it through headers from the desired cell/stage to a withdrawal manifold and a series of cylinder withdrawal positions within the PW Facility. Presently, the PW headers, a series of chilled withdrawal positions and the approved feed (UF₆ sublimation) positions are used within the PW Facility.

The withdrawal system in PW is a set of three refrigeration chambers. Each chamber may contain a 12-inch diameter cylinder. A minimum of one refrigeration chamber with a 12-inch cylinder must be operable to support withdrawal operations; however, withdrawals can be stopped at any time without significant operating concerns other than eventually shutting off the UF₆ feed and treatment gas bleed. The PW withdrawal distribution system will allow any of the refrigeration chamber cylinders to be connected to the withdrawal header feed using the withdrawal chamber header piping. Cylinder pressure will be below atmospheric pressure at all times with flow provided by the differential pressure from the compressor discharge of the withdrawal location to the compressor suction pressure at the cascade return location. The gas temperature will be 90-120 °F with pressures from 2-7 psia and the refrigeration chambers will be operated in the range of 0-25 °F with exit pressures of 0-3 psia. The oxidant partial pressures after dilution by the interstage flow are such that the oxidants and reaction products will not liquefy in the 12-inch cylinders at the refrigeration chamber operating temperatures and pressures. The non-condensed gases will return to the cascade interstage flow. The withdrawal positions and the distribution system are operated from the local control panel.

The withdrawal system is designed to solidify gaseous UF_6 inside of the chilled withdrawal cylinders. The withdrawal chambers are designed and operated in a manner that minimizes the potential for overfilling the cylinder with UF_6 . The process is such that the cylinder fill rate is slow (25-75 lbs. per day) and the configuration of the withdrawal chambers is such that a cylinder scale is part of the chamber design. Operations checks the withdrawal cylinder weight(s) using the withdrawal position scale at least once per shift.

Also, the withdrawal position chambers have defrost controls that limit the defrost cycle such that cylinder temperatures will not reach levels that would cause a rupture. The defrost controls limit the refrigerant temperature to an approximate maximum value of 135° F. The maximum refrigerant temperature is seen as it exits the compressor and enters the withdrawal chamber well. The defrost controls monitor refrigerant temperature as it exits the withdrawal chamber well and enters the compressor, stopping the defrost cycle when the refrigerant reaches approximately 50° F.

The cell treatment material is bled to the cascade at a controlled rate and thus the oxidants are diluted to low concentrations by the interstage flow at the withdrawal location(s) prior to being sent to the withdrawal positions in PW. This prevents any potential liquefaction of ClF_3 or other reaction products in the withdrawal cylinder and maintains the oxidant concentrations well below those that could react explosively with cell coolant. Experience in operating the X-25-7 isotopic and purge equipment is that there are no significant coolant concentration levels. The cascade equipment separates the intermediate and light gases from the UF_6 and the rate of oxidant addition to the cascade is controlled to prevent the maximum concentration of ClF_3 from exceeding 16% at any location in the cascade. Thus, the potential for an exothermic reaction remains acceptable within the existing TSR controls on oxidant addition.

The Side Withdrawal in the X-330 was operated in conjunction with the Interim Purge Drums and the AC-12.5 compressor of the X-330 to X-326 "A" booster. Side Withdrawal within the Interim Purge area of the X-330 is no longer accomplished. The recycle line to the AC-12.5 compressor has been removed and Interim Purge area is abandoned-in-place except piping associated with Interim Purge Surge drum operations.

Portable withdrawal units were also used to make Side Withdrawals via the Line Recorder sampling lines and sample manifold located in each unit of the Cascade. A cell containing the desired assay location would be selected and the sample flow from a pair of Line Recorder sampling lines would be passed through a portable withdrawal unit. The UF_6 would freeze out on the walls of the chilled cylinder and the non-condensibles would be returned to the cascade via the Line Recorder return line.

Small scale Side Withdrawals can be accomplished at any cell in the isotopic cascade via the cell's sampling line and blister manifold, within a cell's LCC. The withdrawal unit consists of a set of heated pigtailed connected to the LCC's blister manifolds and an approved laboratory sample cylinder immersed in a bath of dry-ice (solid CO_2). The valves of the sample cylinder are heated during the withdrawal to prevent UF_6 from freezing out within these valves and the LCCs are bounded. The flow through the sample cylinder is created by the pressure differential across the stage containing the selected assay. The gas flow enters the sample cylinder via the High Side blister manifold and the UF_6 is condensed to internal surface, while the non-condensibles are returned to the Cascade through the A-suction blister manifold.

3.7 HEU AND MEU ACTIVITIES

3.7.1 Description

The Regulatory Approach for Post NRC Certification of Gaseous Diffusion Plants (JW Parks to GP Rifakes, October 11, 1995), DOE will retain regulatory authority over HEU, except for residual HEU that is held up in equipment subsequent to DOE HEU cleanout performed as part of the HEU suspension project and Category III quantities (or less) of other HEU (these small quantities of HEU may be handled incidental to general enrichment activities).

The Fundamental Nuclear Materials Control Plan, submitted as part of this SAR and the associated programs and plans, describes the accounting methods for HEU activities.

As a part of the normal operation of the gaseous diffusion process, cells are treated with oxidant gases to remove deposits of uranyl fluoride and other compounds from the cascade equipment surfaces in a manner described in Section 3.1.1.12. Generally, these treatments liberate a few hundred to several thousand grams of uranium from deposits. The treatment gases, including any uranium liberated from deposits as UF₆, are evacuated to surge drums and then returned to the enrichment cascade at a point near its origin.

Cell treatment may result in the liberation of small quantities of residual HEU that was left in USEC process equipment following completion of the DOE cleanout process. This may occur at any point during the remaining operational life of the enrichment cascade. The liberated HEU material will mix with the LEU material in the process equipment and surge drums and the treatment gases will be returned to the cascade, where it will be mixed with the much larger quantities of uranium present in the interstage flow at LEU enrichments. This process ensures that the blended stream remains within the ²³⁵U possession limits defined in Table 1-3. Analysis of uranium enrichment is not performed prior to returning the mixtures to the cascade. Any changes in uranium inventory due to "recovery" of the relatively small amounts of HEU would be reflected in USEC's enrichment cascade Inventory Difference (ID) during periodic inventories.

In addition to the above activities, as part of the Cold Shutdown activities, DOE has contracted with USEC to remove residual deposits of HEU and MEU from the X-326 Process Building that is held up in equipment subsequent to the DOE HEU cleanout performed as part of the HEU suspension project. This removal of deposits will be conducted by in situ treatment of cells and other cascade equipment with oxidant gases to remove deposits of uranyl fluoride and other uranium compounds from the cascade equipment surfaces in a manner described in SAR Section 3.1.1.12. These deposits have been determined by DOE and NRC to be in an "inaccessible" condition and thus are not counted against the allowable USEC possession limits described in the SAR Chapter 1. The use of in-situ chemical treatments will maintain the HEU and MEU material in an inaccessible condition inside the process equipment. Each treatment will recover from a few hundred grams to 30 kilograms of uranium as UF₆ from deposits; the grams of U-235 in the UF₆ gas will range from a few hundred grams (at very high enrichments) up to 6 kilograms (at an enrichment of 20% U-235).

The UF₆ (HEU and MEU) generated by the treatment process must remain fully contained in the process equipment and cannot be safely withdrawn until separated from the oxidant gases. The treatment gases are sampled in the cells or in holding drums for UF₆ concentration and enrichment and oxidant gas concentrations; based on the concentrations found, the treatment gases are bled to the cascade at a controlled rate to allow for enrichment reduction, separation and recovery of the UF₆ and for the controlled processing and disposal of the treatment gases and other reaction products. The first step is the near instantaneous enrichment blend down by the interstage flow where the treatment gases are introduced into the cell compressors, in the enrichment process equipment. Next, using the gaseous diffusion barrier over a few cells, the oxidant gases are separated from the UF₆ and concentrated for processing and purging from the cascade at a controlled rate. The separated LEU UF₆ is withdrawn as a small portion (25-75 pounds per day) of the interstage flow from the process equipment via dedicated headers to the PW area and withdrawn into small cylinders (12 inch diameter or smaller) placed in refrigeration chambers. The UF₆ (LEU) freezes out and any non-condensables are returned to the enrichment process equipment. The product flow is sampled at PW each shift to confirm the enrichment values; a 12 inch cylinder will be filled every 7-10 days.

The withdrawal system in PW is a set of three refrigeration chambers. Each chamber may contain a 12-inch diameter cylinder. A minimum of one refrigeration chamber with a 12-inch cylinder must be operable to support withdrawal operations; however, withdrawals can be stopped at any time without significant operating concerns other than eventually shutting off the UF₆ feed and treatment gas bleed. The PW withdrawal distribution system will allow any of the refrigeration chamber cylinders to be connected to the withdrawal header feed using the withdrawal chamber header piping. Cylinder pressure will be below atmospheric pressure at all times with flow provided by the differential pressure from the compressor discharge of the withdrawal location to the compressor suction pressure at the cascade return location. The gas temperature will be 90-120 °F with pressures from 2-7 psia and the refrigeration chambers will be operated in the range of 0-25 °F with exit pressures of 0-3 psia. The dilution by the interstage flow will reduce the oxidant concentrations to a level where they will not liquefy in the 12-inch withdrawal cylinders at the refrigeration chamber operating temperatures and pressures. The non-condensed gases will return to the cascade interstage flow. The refrigeration chambers and the distribution system are operated from the local control panel.

The withdrawal system is designed to solidify gaseous UF₆ inside of the chilled withdrawal cylinders. The withdrawal chambers are designed and operated in a manner that minimizes the potential for overfilling the cylinder with UF₆. The process is such that the cylinder fill rate is slow (25-75 lbs. per day) and the configuration of the withdrawal chambers is such that a cylinder scale is part of the chamber design. Operations checks the withdrawal cylinder weight(s) using the withdrawal position scale at least once per shift. Also, the withdrawal chambers have defrost controls that limit the defrost cycle such that cylinder temperatures will not reach levels that would cause a rupture. The defrost controls limit the refrigerant temperature to an approximate maximum value of 135° F. The maximum refrigerant temperature is seen as it exits the compressor and enters the withdrawal chamber well. The defrost controls monitor refrigerant temperature as it exits the well and enters the compressor, stopping the defrost cycle when the refrigerant reaches approximately 50° F.

The cell treatment material is bled to the cascade at a controlled rate and thus the oxidants are diluted to low concentrations by the interstage flow at the withdrawal location(s) prior to being sent to the withdrawal positions in PW. This prevents any potential liquefaction of ClF_3 or other reaction products in the withdrawal cylinders and maintains the oxidant concentrations well below those that could react explosively with cell coolant. Experience in operating the X-25-7 isotopic and purge equipment is that there are no significant coolant concentration levels. The cascade equipment separates the intermediate and light gases from the UF_6 and the rate of oxidant addition to the cascade is controlled to prevent the maximum concentration of ClF_3 from exceeding 16% at any location in the cascade. Thus, the potential for an exothermic reaction remains acceptable within the existing TSR controls on oxidant addition.

The process described above will ensure that the blended stream remains within the ^{235}U possession limits defined in Table 1-3. Any changes in uranium inventory due to "recovery" of the small amounts of HEU during an inventory period would be reflected in USEC's enrichment cascade Inventory Difference (ID) during periodic inventories. After treatment on a cell (or other cascade equipment) is completed, a new baseline holdup NDA measurement will be made.

SECTION 2.7 SPECIFIC TSRs FOR X-326 CASCADE FACILITY

2.7.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.7.3.5 Cell Treatment Monitoring

APPLICABILITY: Cascade Operational Mode IV

LCO: Cell treatments shall be monitored with an Infrared Analyzer.

ACTIONS: **Note:** TSR 1.6.2.2(d) does not apply

Condition	Required Actions	Completion Time
A. Infrared Analyzer inoperable during running cell treatment or during first 24 hours of static (LTLT) cell treatment	A.1 Initiate sampling for free ClF ₃ and the presence of hydrocarbons	30 Minutes
B. Above condition required actions and/or completion time are not accomplished	B.1 Evacuate cell contents	30 Minutes

SURVEILLANCE:

Frequency	Surveillance
Each cell treatment	SR 2.7.3.5.1 Verify and document the installation of an Infrared Analyzer prior to the initial charge of treatment gas
Once per day during LTLT or Static Cell Treatment	SR 2.7.3.5.2 Collect sample from cell and analyze using Infrared Analyzer

BASIS:

Deposit removal can be conducted on cascade equipment that is operating or on equipment that is shutdown. The rate of oxidant gas consumption, especially ClF₃, is dependant on whether the treatment being performed is a running or static treatment. In either type of treatment, the treatment gas mixture is monitored to assure that no hydrocarbons or fluorocarbons are present and that free ClF₃ is always present to prevent the formation of ClO₂ and Cl₂ which can damage cascade equipment and can pose hazards during subsequent processing to recover UF₆ recovered by the chemical treatments. A specialized type of static chemical treatment, called Long-Term, Low-Temperature (LTLT), is used for shutdown equipment.

During cell treatments with process equipment running, failure to maintain an adequate amount of ClF₃ within the cell can lead to the formation of reaction products that will result in highly exothermic reactions upon the re-introduction of ClF₃/F₂. In addition, the Infrared Analyzer is used to detect the presence of hydrocarbon materials that could also react violently with ClF₃/F₂

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2.7.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.7.3.5 Cell Treatment Monitoring (continued)

under the right conditions. Replacing an inoperable analyzer can take up to three hours. For this reason sampling is initiated within thirty minutes and continued until an operable analyzer is hooked up and operating properly.

Static cascade equipment treatments are those performed where the cell (or other cascade equipment) is not running. Higher concentrations of oxidant gases are used and the pressure of the cell (or equipment) is maintained below atmospheric pressure. Because of the lower temperatures, absence of running equipment and additional measures to prevent the presence of coolant, static (LTLT) cell treatments do not progress rapidly or have the potential for rapid changes of conditions that could result in an exothermic or explosive reaction. Operator presence and frequent monitoring of the cell temperatures, pressures and infrared monitor readings occur during the initial addition of treatment gas increments and for twenty four hours after the last increment is added. After the initial treatment monitoring period, an operator will monitor the cell (or equipment) temperatures, pressures at least once each shift and will collect a gas sample from the cell at least once every day to verify that free ClF_3 is present and that no unexpected reactions are occurring.

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The United States Enrichment Corporation (USEC) has reviewed the proposed changes associated with this certificate amendment request and provides the following Significance Determination for consideration.

1. No Significant Change to Any Conditions to the Certificate of Compliance

Condition 17 addresses the HEU Caretaker provisions which USEC is implementing under contract to the DOE. There are two basic requirements in this Condition: First, NRC must be notified 30 days prior to any planned reduction in the surveillance requirements of the Caretaker Project being conducted for DOE. Second, USEC shall notify NRC in writing within 15 days of obtaining a result of a measurement, as part of the Caretaker Project, of a holdup quantity of uranium above 10% enrichment in installed equipment leased by USEC that is outside of the measuring instruments accuracy range. This condition was determined to be adequate for assuring adequate safeguards of HEU/ MEU existed based on the following:

1. The HEU/ MEU is inaccessible and controlled
2. The HEU/MEU holdup has been measured and recorded
3. The HEU/ MEU material is included in NMC&A records
4. Transfer actions involving removal of installed equipment are reported in accordance with USEC procedures.

Based on the above information and Condition 17 of the Certificate, NRC would continue to regulate inaccessible and diffuse holdup material enriched to 10% U-235 or greater in installed equipment while DOE would regulate this material in uninstalled equipment, and DOE would regulate the opening and closing of installed equipment containing HEU. After a cell treatment is completed, new NDA measurements will be taken to establish a new holdup quantity for the cell equipment and Caretaker measurements will continue to be taken and reported as necessary. Any changes to uranium inventory due to "recovery" of the relatively small amounts of HEU/MEU during an inventory period would be reflected in USEC's enrichment cascade Inventory Difference (ID) during the periodic inventories, as currently described in SAR Section 3.7.

The proposed change has no significant impact on any conditions to the Certificate of Compliance.

2. No Significant Change to Any Condition of the Approved Compliance Plan

All Compliance Plan Issues have been closed. As a result, the conditions specified in the Compliance Plan are no longer in effect. Thus, these proposed changes do not represent a significant change to any condition of the approved Compliance Plan.

3. No Significant Increase in the Probability of Occurrence or Consequences of Previously Evaluated Accidents

The proposed changes do not directly or indirectly affect the probability of occurrence of previously evaluated accidents involving cell treatments. The accidents involving gas treatment of cells are analyzed in the SAR and the supporting documents (PrHA/PSOA). The use of LTLT cell treatments for HEU deposit removal will not increase the probability or consequences of the bounding accidents analyzed in the SAR, or affect the analyses of supporting documents.

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Cell treatments for deposit removal are described in the SAR and have been conducted for many years. Controls in the SAR and TSRs maintain the overall risk of accidents within the SAR envelope. Performing cell treatments on shutdown HEU/MEU equipment, using LTLT or smaller static treatments, remains within the overall analyzed risk. Additionally, the probability of an exothermic reaction occurring is very small because the initiating events associated with running compressors are removed and the controls in the TSR and SAR maintain a very low risk of such a reaction occurring due to the cell treatment gases.

The probability of depletion of ClF_3 is not increased; coolant is less likely to be present in an LTLT treatment; the probability of hydrocarbons is not increased; and, because LTLT is performed on non-running cells, the probability of reaction initiation or leaks is greatly reduced.

Analysis of previous data shows that representative sampling and analysis of treatment gases can be performed during LTLT treatments for HEU/MEU deposit removal. However, changes are required to TSR 2.7.3.5, "Cell Treatment Monitoring."

Nevertheless, using the LTLT treatment process in all process buildings does not increase the probability of occurrence of an accident previously evaluated in the SAR.

Nuclear Criticality Safety controls provide adequate control of existing HEU/MEU deposits primarily by moderation control and by preventing additional uranium from being added to the deposits. The treatment of cells for HEU/MEU deposit removal with oxidant gases maintains or further reduces the moderation available to deposits. Due to controls applied during the original HEU enrichment cascade shutdown and associated deposit removal conducted at that time, none of the deposits in the HEU/MEU cells (including measurement uncertainty) are greater than a minimum critical mass. However, many of the deposits to be removed (or reduced) are greater than an always safe mass. Since the cell compressors are not running during LTLT or static treatments, vibration and kinetic energy sources that could change the geometry of the deposit due to mechanical energy are not present.

The proposed change does not affect the probability of an uncontrolled release of radioactive material or of a criticality in facilities or operations governed by the NRC Certificate of Compliance. The SSCs relied upon to prevent occurrence of an accident previously evaluated in the SAR will continue to meet the current SAR envelope requirements for availability and reliability and will assure acceptable risk for this new activity. The TSRs will be met as required for plant operations with the change described.

Therefore, there is no increase in the probability of occurrence or consequences of any previously evaluated accidents

4. No New or Different Type of Accident

The fact that cell treatments of enrichment equipment could include the liberation of HEU/MEU material is described in the SAR Section 3.7, HEU and MEU Activities. The SAR states in part, "cell treatment may result in the liberation of small quantities of residual HEU that was left in USEC process equipment following completion of the DOE cleanup process. This may occur at any point in the operational life of the enrichment cascade. The liberated HEU material will mix with the LEU material in the process

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equipment and surge drums and the treatment gases will be returned to the cascade, where it will be mixed with the much larger quantities of uranium present in the interstage flow at LEU enrichments.” The proposed change is essentially the same process described in the SAR except that it will be conducted on a larger scale as a primary activity in the X-326 facility.

The LTLT treatment process has been thoroughly analyzed and tested in X-326 and utilized for Deposit Removal Program treatments in X-330 and X-333. It introduces no new chemistry or chemical compounds. It offers no new hazards associated with treating uranium deposits greater than safe mass. It creates no new hazards associated with oxidant gas mixtures or fires.

While the proposed change revises the monitoring requirement of the TSR for these cell treatments, analysis of cell treatment data from treatments performed to date shows that representative and accurate sampling and analysis of LTLT treatment reaction products can be performed to meet the intent of the existing TSR for these LTLT and static treatments of cascade cells and equipment containing HEU/MEU deposits. Also, existing measurement equipment and procedures can be used to meet the proposed revised requirements of TSR 2.7.3.5.

The possibility of a criticality accident associated with uranium deposits in cascade equipment is evaluated in the SAR and the presence of solid HEU/MEU deposits in the cascade shutdown equipment is described. NCS analyses have evaluated and provided NCS controls covering the solid deposits in this equipment and are based primarily on moderation control and preventing the addition of enriched uranium to these deposits. All of the deposits (including measurement uncertainty) are less than a minimum critical mass. Cell treatments convert a portion of the solid uranium deposits into a UF₆ gas, which is less reactive from an NCS standpoint than the solid deposits. Also, the treatment environment is a very strong fluorinating environment and prevents atmospheric moisture from reacting with or moderating uranium present in the gas phase. Thus, the cell treatment to remove uranium from the deposits places the material removed in a less reactive state from an NCS standpoint and maintains that state until the uranium is blended down to LEU. Thus, there is no new criticality accident associated with the proposed change.

This proposed change will not create a new or different type of accident.

5. No Significant Reduction in Margins of Safety

The proposed LTLT HEU cell treatments will require a change to TSR 2.7.3.5, “Cell Treatment Monitoring” but does not conflict with the supporting bases documents. The requirements of TSR 2.7.3.4, “Coolant Removal,” TSR 2.7.3.7, “Oxidant Control,” and TSR 2.7.3.14, “Moderation Control” will continue to be fully met. Operator sampling and IR analysis will be done once per day and will continue to provide adequate sample analysis to assure safety of the process. If the building SPIRA or PIRA becomes inoperable, laboratory sampling will be initiated and continued as required by the TSR. The additional safety features of the LTLT treatments (e.g., non-running compressors, buffered coolant systems, low temperatures, etc.) provide additional margin of safety and defense-in-depth for LTLT cell treatments compared to running treatments on which the TSRs were originally based. Experience with LTLT and static treatments is that after the initial addition of the treatment gas shots and the reaction stabilization period (usually 1-2 hours), the concentration of oxidants

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declines very slowly and predictably. Particularly, ClF_3 concentrations decline by 1-2 mole percent over a period of weeks. Normally, the treatments are terminated when the ClF_3 concentrations are 5 mole% or greater. Thus, daily sampling and analysis of treatment gases is more than adequate to meet the TSR criteria of assuring the presence of free ClF_3 . The cell treatment monitoring is also required to identify the presence of hydrocarbons; this concern is adequately addressed during the initial monitoring of the treatment shot addition and reaction stabilization. Since the cell equipment is not running for LTLT or static treatments and the coolant is drained, evacuated and the coolant system buffered and the cell lube oil is valved off and drained, there is no significant source of hydrocarbons or coolant that could be introduced during the ongoing treatment.

Therefore, the proposed use of the LTLT treatment process for HEU/MEU deposit removal in the X-326 Building with the proposed changes to the cell treatment gas monitoring requirements provide adequate margin of safety. The proposed changes have no impact on any of the other TSRs in Section 2 or on any of the program requirements in TSR Section 3.

Therefore, there is no reduction in the margin of safety.

6. No Significant Decrease in the Effectiveness of the Plant's Safety and Safeguards or Security Programs and Plans

The Environmental Protection-Radiological Program is described in SAR Section 5.1. The proposed change does not directly or indirectly impact this program. The proposed change does not affect any of the controls or requirements imposed by this program nor does it impact the program scope. Therefore, the proposed change does not reduce the effectiveness of this program.

The criticality safety hazards are controlled in accordance with the Nuclear Criticality Safety Program as described in SAR Section 5.2. The proposed change does not impact directly or indirectly this program; the proposed change does not affect any of the provisions or requirements of the NCS program. The NCS program describes the presence of HEU and the manner in which NCS controls and analyses handle the presence of HEU. Therefore, the proposed change does not reduce the effectiveness of the NCS program.

The radiological exposure hazards to personnel associated with PORTS operations are controlled in accordance with the Radiation Protection Program described in SAR Section 5.3. The proposed change does not directly or indirectly impact any of the controls or requirements imposed by that program; the proposed change does not reduce program effectiveness.

The Fire Protection program is described in SAR Section 5.4. The proposed change does not require any change to the controls imposed by this program, nor does it involve any direct or indirect impact on this program. The proposed change does not reduce the effectiveness of this program.

The Radioactive Material Use/Transfer Program is described in SAR Section 5.5 and the Radioactive Waste Management Program, Section 6.5. The proposed change does not directly or indirectly impact any of the program requirements or controls; the proposed change does not reduce the effectiveness of these programs.

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The protection of plant personnel from industrial chemical hazards is described in SAR Section 5.6, Chemical Safety Program. The proposed change does not directly or indirectly impact this program nor does it reduce the effectiveness of the Chemical Safety program. There is no impact or change to any controls or requirements imposed by this program.

The Analytical Support Program is described in SAR Section 5.7. The proposed change does not impact (directly or indirectly) any of the requirements of this program and thus there is no reduction in the effectiveness of this program.

Plant Programs and Plans

The proposed change does not impact (directly or indirectly) the Quality Assurance Program (QAP). There is no direct or indirect change to the scope, requirements, or controls of the QAP. Therefore, the proposed change does not reduce the effectiveness of the QAP.

The proposed change does not impact (directly or indirectly) the Emergency Plan (EP). There is no direct or indirect change to the scope, requirements, or controls of the EP. Therefore, the proposed change does not reduce the effectiveness of the EP.

FNMCP

The proposed change does not impact the Fundamental Nuclear Materials Control Plan (FNMCP). There is no direct or indirect change to the scope, requirements, or controls of the FNMCP. The FNMCP provides the controls needed to handle the HEU/MEU deposit removal and account for the LEU product to be produced. Therefore, the proposed change does not reduce the effectiveness of the FNMCP.

Security Plans

The proposed change does not impact (directly or indirectly) the Transportation Security Plan (TSP). There is no direct or indirect change to the scope, requirements, or controls of the TSP. Therefore, the proposed change does not reduce the effectiveness of the TSP.

The proposed change does not impact (directly or indirectly) the Physical Security Plan (PSP). There is no direct or indirect change to the scope, requirements, or controls of the PSP. The HEU/MEU will remain inaccessible inside the process equipment as long as it exists as HEU/MEU. The controls provided in the X-326 Security Plan continue to be adequate to assure maintenance of the HEU/MEU material in an inaccessible condition. Conversion of the HEU/MEU from solid deposits to gaseous UF₆ mixed with treatment gases makes the material even less accessible than is currently the case. The deposit removal program will blend the HEU/MEU down to LEU within the process equipment in such a manner that the only significant quantity of uranium material withdrawn from the cascade will be LEU. Small samples containing HEU/MEU will be withdrawn for analyses; however, the quantities will be within the Certificate possession limits. Therefore, the proposed change does not reduce the effectiveness of the PSP.

The proposed change does not impact (directly or indirectly) the Classified Matter Plan (CMP). There is no direct or indirect change to the scope, requirements, or controls of the CMP. Therefore, the proposed change does not reduce the effectiveness of the CMP.

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The effectiveness of these programs and plans is not decreased by the proposed changes.

7. The Proposed Changes do not Result in Undue Risk to 1) Public Health and Safety, 2) Common Defense and Security, and 3) the Environment

Question 1. The proposed change does not result in an undue risk to public health and safety. While the proposed change requires a change to TSR 2.7.3.5 and an addition of a new operation (HEU/MEU deposit removal, blend down, and LEU withdrawal) to the SAR, the change remains within the SAR accident analysis assumptions regarding quantities of hazardous material, types of operations and required controls. The PORTS operations with the proposed change remain within the safety envelope described in the SAR and Transportation Certificates of Compliance.

Question 2. The proposed change does not result in an undue risk to the common defense and security. As noted in the answers to PCR Questions 3.C, D, E, and F, the proposed change does not require a change to the GDP Security Plans or the FNMCP. The PORTS Security Plan for the X-326 Process Building considers the HEU/MEU present to be inaccessible while it is contained in the process equipment and controls are in place to protect against the unauthorized breach of the process equipment containment. The proposed change continues to utilize the same protection strategy with the blend down to LEU within the enrichment cascade prior to withdrawal of the UF₆ as LEU product. Any small samples taken for process control of cell treatments and blend down activities will contain only small quantities of HEU/MEU and will be controlled within the Certificate possession limits for HEU/MEU. As such, the proposed change does not introduce any undue risk to the common defense and security.

Question 3. The proposed change does not result in an undue risk to the environment. As noted above, there is no change to the safety envelope described in the SAR Accident Analysis or in the Transportation Certificate of Compliance. The proposed change does not impact the Environmental Protection program described in SAR Section 5.1. Finally, the proposed change does not require a change to the Environmental Compliance Status and Environmental Monitoring Report, to the Radioactive Waste Management Program or to the Supplemental Environmental Information Related to the Compliance Plan. In addition, the proposed change does not impact any of the EPA permits or permitted discharges. As such, the proposed change does not result in undue risk to the environment.

Consequently, these changes do not result in undue risk to the public health and safety, the environment, or the common defense and security.

8. No Change in the Types of Significant Increase in the Amounts of Any Effluents that May Be Released Offsite

The proposed change will not change the types of any effluents that may be released offsite beyond those already evaluated for cell treatments and enrichment cascade operations. The proposed change will not result in an increase in the amounts of effluents that may be released offsite over those released by cell treatments and operation of the enrichment process.

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9. No Significant Increase in Individual or Cumulative Occupational Radiation Exposure

The proposed change will not result in a significant increase in the individual or cumulative occupational radiation exposure since the amount of uranium processed is very small compared to previous processing

amounts or to the Certificate possession limits. The types of operations are similar to those conducted during enrichment and shutdown activities. The fact that the treatment pressures will be below atmospheric pressure, the withdrawals will be below atmospheric pressure using sublimation, the HEU/MEU recovered will be less reactive, from an NCS perspective, than the solid deposits, and the overall amount of HEU present in the shutdown cascade will be substantially reduced, the proposed change will not have the potential to increase occupational radiation exposures over what has been experienced from enrichment and shutdown operations.

There is no increase in individual or cumulative occupational radiation exposure as a result of these changes.

10. No Significant Construction Impact

While there will be modifications to enrichment process equipment involved in the proposed change, the construction activities will be limited to within process facilities and transport of equipment between the X-343 and X-326 facility utilizing existing NCS and radiological controls for transport of such equipment.