Enclosure 1
GDP 12-0007

USEC-01
Certificate Amendment Request

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 Paducah Gaseous Diffusion Plant addressing revisions to the Technical Safety Requirements contained in USEC letter GDP 12-0007, 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.

S. A. Toelle

Steven A. Toelle

On this 19th day of March, 2012, 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

Rita Peak, Notary Public
State of Maryland, Montgomery County
My commission expires December 10, 2013

Enclosure 2
GDP 12-0007

USEC-01
Certificate Amendment Request

Deletion of Specific Technical Safety Requirements (TSRs) for the UF_6 Feed Facilities (C-333-A and C-337-A), Product and Tails Withdrawal Facilities (C-310 and C-315), Enrichment Cascade Facilities (C-331, C-333, C-335, and C-337), Deletion of Specific TSRs for Criticality Accident Alarm System (Non-Cascade Facilities), and Revision to TSR Section 3.0, Administrative Controls.

Detailed Description and Justification of the Changes

United States Enrichment Corporation (USEC)
Certificate Amendment Request
Deletion of Specific Technical Safety Requirements (TSRs) for the UF_6 Feed Facilities (C-333-A and C-337-A), Product and Tails Withdrawal Facilities (C-310 and C-315), Enrichment Cascade Facilities (C-331, C-333, C-335, and C-337), Deletion of Specific TSRs for Criticality Accident Alarm System (Non-Cascade Facilities), and Revision to TSR Section 3.0, Administrative Controls.

Detailed Description and Justification of the Change(s)

1) Description of Change(s)

The following Technical Safety Requirements (TSRs) are to be deleted from the "*Application For United States Nuclear Regulatory Commission Certification, Volume 4, Paducah Gaseous Diffusion Plant, Technical Safety Requirements*" document, Section 2.0, Facility Specific Technical Safety Requirements:

2.2 Specific TSRs For UF_6 Feed Facilities (C-333-A and C-337-A):
- 2.2.1, Operational Modes;
- 2.2.2, Safety Limits, including TSRs 2.2.2.1 through 2.2.2.2;
- 2.2.3, Limiting Control Settings, Limiting Conditions for Operations, Surveillances, including TSRs 2.2.3.1 through 2.2.3.3;
- 2.2.4 General Limiting Conditions for Operations, including TSRs 2.2.4.1 through 2.2.4.15;
- 2.2.5, General Design Features, including DFs 2.2.5.1 through 2.2.5.5; and
- Appendix A, Maximum Weight Limits for UF_6 Cylinders.

2.3 Specific TSRs for Product and Tails Withdrawal (C-310 Downstream of Normetex Pump Suction and C-315):
- 2.3.1, Operational Modes;
- 2.3.2, Safety Limits, including TSRs 2.3.2.1 through 2.3.2.2;
- 2.3.3, Limiting Control Settings, Limiting Conditions for Operations, Surveillances, including TSRs 2.3.3.1 through 2.3.3.2;
- 2.3.4 General Limiting Conditions for Operations, including TSRs 2.3.4.1 through 2.3.4.25;
- 2.3.5, General Design Features, including DFs 2.3.5.1 through 2.3.5.6; and
- Appendix A, Maximum Weight Limits for UF_6 Cylinders.

2.4 Specific TSRs for Enrichment Cascade Facilities (C-331, C-333, C-335, C-337 and C-310 up to Normetex Pump Suction):
- 2.4.1, Operational Modes;
- 2.4.2, Safety Limits including TSRs 2.4.2.1 through 2.4.2.3;
- 2.4.3, Limiting Control Settings, Limiting Conditions for Operations, Surveillances, including TSRs 2.4.3.1 through 2.4.3.5;
- 2.4.4 General Limiting Conditions for Operations, including TSRs 2.4.4.1 through 2.4.4.15;
- 2.4.5 General Design Features, (no Design Features associated with Enrichment Cascade Facilities)
- Appendix A, Applicability Table for Equipment Removal TSRS; and
- Appendix B, Safe Mass over a Range of Assays: H/U = 4

2.6 Specific TSRs for Criticality Accident Alarm System (Non-Cascade Facilities):
- 2.6.1, Operational Modes;
- 2.6.2, Safety Limits, (no safety limits associated with Criticality Accident Alarm System [CAAS]);
- 2.6.3, Limiting Control Settings, Limiting Conditions for Operations, Surveillances, (no Limiting Control Settings for CAAS);
- 2.6.4 General Limiting Conditions for Operations, TSR 2.6.4.1

The individual TSR pages being deleted can be viewed in Enclosure 3 of this submittal.

There is the potential that USEC will de-lease a facility and return it to DOE regulatory oversight and retain a facility that shares a common set of TSRs (e.g., De-lease the C-333-A feed facility and retain the C-337-A feed facility). If this occurs the TSRs that were applicable to both of the facilities will only be applicable to the facility that USEC retains under NRC regulatory oversight. The applicable TSRs will remain in the Application until all the facilities covered by the TSRs are de-leased and returned to DOE regulatory oversight. USEC will continue to meet all TSR and SAR surveillance requirements and maintenance of systems, structures, and components as necessary to ensure the applicable safety basis are maintained for the facility still under NRC regulatory oversight. This includes complying with all the Application programs and plans for that facility. When de-leased, the DOE will assume complete regulatory oversight of a facility including all surveillance, maintenance, and program/plan requirements of the DOE safety basis documents. When all facilities covered by common TSRs are de-leased and returned to DOE regulatory oversight, the TSRs will be removed from the Application.

Revisions to the Technical Safety Requirements (TSRs) contained in the "*Application For United States Nuclear Regulatory Commission Certification, Volume 4, Paducah Gaseous Diffusion Plant, Technical Safety Requirements*" document, Section 3.0, Administrative Controls, are shown as underlined additions as follows:

TSR Section 3.2.2, Facility Staff, Table 3.2.2-1, Minimum Staffing Requirements, changes:

Table 3.2.2-1 Minimum Staffing Requirements[a]

Facility Function	Mode/Operation	Staffing Requirements[h]	Work Area Definition
C-300[g]	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360[b]	1b, 3, 4, 5	1	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	2A, 6	1	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	1	One person in the Laboratory.
	1a	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A[b]	1, 2, 5, 7	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A[b]	3, 4, 8	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2[c]	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2[c]	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331 / C-335	Cascade 1, 2 F/S 1, 2, 3, 4, 5	2[f]	At least one person in the ACR.
	Cascade 1[e]	1	One person in building

C-333 / C-337	Cascade 1, 2 F/S 1, 2, 3, 4, 5	3[f]	At least one person in the ACR.
	Cascade 1[e]	1	One person in building
Health Physics[g]	At all times	1	Onsite.
Power Operations[g]	At all times	4	Onsite.
Utilities Operations[g]	At all times	4	Onsite.
Fire Services[g]	At all times	4[d]	Onsite[d].
Security Services[g]	At all times	4	Onsite.

a. Staffing may be less than the minimum requirement listed for a period of a time not to exceed four hours in order to accommodate unexpected absence of on-duty shift members provided immediate action is taken to restore the shift manning requirements to within the minimum requirements. The C-331, C-333, C-335, and C-337 ACRs shall always be manned. The ACRs for C-310, C-315, C-333-A, and C-337-A shall be manned when required by operating mode. Manning not required during emergency conditions requiring building/area evacuation.

b. Manning requirement is zero if, 1) all C-333-A or C-337-A autoclaves are in MODE 6 (Not In Use), or 2) all C-360 autoclaves are in Mode 2B (out of service) or MODE 8 (Not In Use) and the Transfer Station is in MODE 8 (Not in Use).

c. When withdrawal process equipment is brought below atmospheric pressure, or to a UF_6 negative in the NOT IN USE (Mode 4) operating mode then the staffing requirements for the appropriate withdrawal facility do not apply.

d. In accordance with footnote "a", Fire Services personnel making an unexpected run to deliver an individual to a local hospital are allowed to be offsite and are considered to be on duty and available.

e. The facility is not enriching UF_6 (no stage/booster motors running) and only operations involved with: 1) maintaining a fluorinating environment or dry gas blanket in accordance with TSR 2.4.4.4 or 2) operating a P&E pump.

f. Staffing requirements is zero for limited operations involving equipment, headers and surge drums containing UF_6, if: 1) UF_6 in piping/equipment is below atmospheric pressure; 2) all cascade enrichment cells including booster stations are in Cascade Mode 3, and 3) P&E pumps are not energized.

g. USEC may procure personnel to fulfill the minimum staffing requirements for C-300 (PSS, Cascade Coordinator, and Power Operator), Fire Services, Security Services, Utilities, Power Operations, or HP from DOE as enrichment cascade and support facilities are de-leased and returned to DOE regulatory oversight. Compliance with the governing NRC safety basis documents (SAR, TSRs, Emergency Plan, Fire Protection Program, Security Programs, etc.) will remain the responsibility of USEC and the personnel that meet the TSR minimum staffing requirements. USEC will control and oversee these personnel for the PGDP facilities and operations still operated by USEC under NRC regulatory oversight.

h. USEC will eventually de-lease and return to DOE all process buildings (except C-360) having minimum staffing requirements. The de-lease may be as individual facilities, groups of facilities, or all at once. When facilities are de-leased and returned to DOE regulatory oversight, USEC will not be required to meet the minimum staffing requirements specified in this table for the de-leased facilities. When the facility has been de-leased and returned to DOE regulatory oversight, the facility minimum staffing requirements and associated note(s) will be lined through but not removed from the table.

TSR Section 3.21, Sharing of Facilities, Structures, Systems, and Components, revised as follows:

> Facilities, structures, systems, and components relied upon in Section 2 of the TSRs are controlled by USEC. The Corporation is not dependent upon outside agencies to provide the level of safety described in this TSR except as follows. The Corporation will eventually cease UF_6 enrichment operations and support operations in facilities (except the C-360 facility) that have TSRs in Section 2. Following cessation of enrichment and support operations, the facilities will be de-leased and regulatory oversight will transfer from NRC to DOE. The applicable Section 2 TSRs for the NRC regulated facilities will be deleted and USEC will no longer be responsible for the surveillance or maintenance of the facility and SSCs. In addition, it is possible that USEC may procure support services from DOE regulated facilities to support continuing USEC operations.

TSR Section 3.23, Worker Protection From UF_6 Process Hazards, Item g. Add the following text:

g. For building C-310, C-315, C-331, C-333, C-333-A, C-335, C-337, C-337-A, C-360, C-400, C-409, C-710, C-720, C-746-Q1:

Note: The Corporation will eventually cease UF_6 enrichment operations and support operations (except the C-360 facility) at PGDP. The facilities will be de-leased and returned to DOE regulatory oversight. DOE regulations require that DOE establish equivalent worker protection from UF_6 hazards. When the facilities are de-leased it will no longer be the Corporation's regulatory responsibility for worker protection in the de-leased facilities.

The individual TSR pages being revised can be viewed in Enclosure 3 of this submittal.

2) Reason for the Change(s)

This change is being made to support the future de-lease of the specified PGDP site facilities sometime following the shutdown of the enrichment cascade. The C-360 facility will remain in operation for a period of time to process existing on-site cylinders and support receipt/shipment of UF_6 cylinders.

When enrichment operations cease, the majority of the TSR facilities (except C-360) will be placed into shutdown conditions until facilities are de-leased and returned to DOE regulatory oversight. USEC will continue to meet all TSR and SAR required surveillances and maintenance (S&M) of systems, structures, and components (SSCs) as necessary to ensure the applicable safety bases are maintained. This includes complying with all requirements of the Application programs and plans. USEC may choose to procure some or all of the required program/plan services from the DOE. If these services are procured from the DOE, they will be established and controlled in a manner similar to the existing process at the American Centrifuge Plant in Piketon, OH.

3) Justification of the Change(s)

When USEC ceases all PGDP enrichment operations and shuts down the enrichment cascades, USEC intends to de-lease and return most facilities to DOE. USEC will retain the C-360 facility for a period of time to process existing on-site cylinders and support receipt/shipment of UF_6 cylinders. Support facilities, such as the feed and withdrawal facilities, will be required for some time after the enrichment cascade is shut down to support cylinder transfers, product cylinder heel recovery, and provide support for ongoing operations in C-360. These support facilities may be retained and operated by USEC or, alternatively, de-leased to DOE with USEC purchasing the required services from DOE. Support services, such as use of feed/evacuation headers and support equipment in de-leased facilities or programs/plans (e.g., maintenance, NMC&A, fire services, utilities, etc.), may be procured from the DOE in accordance with de-lease contractual requirements and associated Master Binding Facility Agreement (MBFA) documents. USEC will purchase these services from the DOE in a manner similar to the existing process at the American Centrifuge Plant. USEC will remain responsible for all applicable regulatory requirements.

After the enrichment cascade facilities are shut down, the majority of the other TSR facilities (except C-360) will be placed into shutdown conditions until the facilities are de-leased and returned to DOE. USEC will continue to meet all TSR and SAR required surveillances and maintenance (S&M) of systems, structures, and components (SSCs) as necessary to ensure the applicable safety bases are maintained. This includes complying with all requirements of the Application programs and plans. DOE regulations require that DOE establish a safety basis to ensure that there is no undue risk to the public health and safety, common defense and security and the environment for the de-leased facilities. In accordance with 10 CFR 830 Part B the safety basis document must either be a Documented Safety Analysis (DSA) or a Basis for Interim Operation (BIO). The two cases in which a BIO is allowed involve short lived activities and during

transition phases, including transition surveillance and maintenance, deactivation and decontamination and decommissioning. The scope of the required DOE authorization and safety basis documentation is expected to be within the operations already analyzed in the current SAR. None of the accidents described in the SAR, for the facilities to be de-leased, would have a significant impact to the facilities or operations that will remain under the NRC Certificate of Compliance. No accident in the de-leased facilities to be regulated by the DOE would have the potential of causing an accident in NRC regulated space. While there are accident scenarios that could result in evacuation of facilities remaining under the USEC/NRC Certificate of Compliance, they are the same accidents (i.e., UF_6 release from an operating DOE facility) that could now potentially occur prior to de-lease. DOE regulations require that DOE establish a safety basis in accordance with 10 CFR 830 prior to de-lease to ensure that there is no undue risk to the public health and safety, common defense and security and the environment for the de-leased facilities. USEC will identify and evaluate any changes that might occur during the DOE safety basis review and approval cycle which might impact USEC's remaining certified operations. It is unlikely that any of the previously existing operations in these DOE owned facilities addressed in the DOE safety basis and controlled by TSRs would result in an increase in the probability of a previously evaluated accident in the remaining NRC regulated facilities. Any changes in these potential DOE activities and operations that could possibly occur after de-lease, but prior to any actual D&D, would be evaluated under DOE's required change process. If such changes have potential to impact NRC Certified operations, or other site tenants, the changes must be submitted to the affected tenant(s) for evaluation and expression of concern(s) in accordance with the Shared Site review process. The turnover from NRC to DOE regulatory authority will coincide with the USEC de-lease of facilities either as a group of facilities or as individual facilities.

With the cessation of enrichment operations and the placement of the uranium processing facilities into shutdown conditions, the risk to the public and plant workers will be significantly reduced from that which was initially certified and required under the current TSRs. The main contributor to the reduced risk centers on scenarios associated with large UF_6 releases. The major contributors to the reduction in risk of a large UF_6 release include the following: 1) a significant reduction in the cascade UF_6 maximum inventory; 2) cascade operating stage reduction (all cells/staged in C-331, C-333, C-335, and C-337 will be shutdown); 3) reduction of UF_6 cylinder heating and feeding operations in C-333-A and C-337-A facilities; and 4) reduction of liquid UF_6 operations at the product and tails withdrawal stations in C-310 and C-315, respectively. These actions significantly reduce the potential probability and consequences of corresponding UF_6 release scenario accidents evaluated in the SAR. The shutdown of the high inventory cascade cells in the enrichment cascade process buildings eliminates the potential for those large UF_6 release scenarios related to breaches in cascade containment and those related to large cascade fires. The risk of a nuclear criticality due to the shutdown of enrichment and support operations at PGDP is significantly reduced for some scenarios and for others the risk remains unaffected. With no enrichment cascade process building cells running, the probability of a primary system breach due to a hot metal reaction (HMR) or a large fire is reduced and the availability of water from external sources is reduced with the shutdown of the enrichment cascade equipment. In addition, the majority of the UF_6 will have been removed from the cascade and support equipment following shutdown. Therefore the risk of a nuclear criticality due to one of these scenarios or other UF_6 release scenario is significantly reduced. For other scenarios, the shutdown of the enrichment cascade equipment does not impact the risk of a nuclear criticality as the applicable NCSE/NCSAs ensure the probability of a nuclear criticality is not increased. Therefore, the risk of a nuclear criticality following the shutdown of the enrichment and support facilities at PGDP is either reduced or remains unchanged depending on the initiating event scenario. During facility shutdown conditions there are no potential plant conditions or events that require TSR safety system actions or immediate operator required actions to mitigate the condition or event.

Revision to TSR 3.0, Administrative Controls

The changes to this section of the TSRs are only intended to reflect the scope of their applicability after de-lease of the majority of the other TSR facilities (except C-360).

The proposed changes to the minimum staffing requirements in TSR Table 3.2.2-1 reflect the deletion of the TSRs applicable to the cascade enrichment, feed, and withdrawal facilities after de-lease and turnover to DOE regulatory oversight following cessation of enrichment operations and associated support operations in the majority of TSR facilities (except C-360). Once the facilities are returned to DOE regulatory oversight, USEC will no longer be responsible for maintaining the minimum staffing requirements for the de-leased facilities. USEC may choose to contract personnel to fulfill the minimum staffing requirements for C-300 (PSS, Cascade Coordinator, and Power Operator), Fire Services, Security Services, Utilities, Power Operations, and/or HP from DOE as enrichment cascade and support facilities are de-leased and returned to DOE regulatory oversight. Compliance with safety basis documents including the PGDP SAR, TSRs, Emergency Plan, Fire Protection Program, and Security Program, will remain the responsibility of USEC and the personnel that meet the TSR minimum staffing requirements. USEC will control and oversee these personnel for the PGDP facilities and operations still leased by USEC under NRC regulatory oversight.

The proposed change to TSR 3.21, Sharing of Facilities, Structures, Systems, and Components, also reflects the cessation of enrichment operations and associated support operations in the enrichment cascade, feed, and withdrawal facilities. These facilities will be de-leased and returned to DOE regulatory oversight. Since USEC may procure support operations and services from these DOE facilities, the discussion required revision to address this potential sharing of facility operation and services. These operations and support services will be operated in the same safe manner as they were while under USEC management and NRC regulatory control. DOE regulations require that DOE establish a safety basis for any operations and hazards in these de-leased facilities to ensure that there is no undue risk to the public health and safety, common defense and security, and the environment. The de-lease contractual requirements and the associated MBFA documents will establish and control how these operations and services are provided to USEC by DOE.

The proposed change to TSR 3.23, Worker Protection From UF_6 Process Hazards, item g, will add a note stating USEC is no longer responsible for worker safety after the facilities are de-leased by USEC and returned to DOE regulatory oversight. Following de-lease and return of TSR facilities to DOE, the only TSR facility USEC will retain under NRC regulatory requirements will be C-360.

Supporting SAR Sections

Upon cessation of all enrichment operations at PGDP the C-360 facility will continue operations to support product cylinder processing and receipt/shipment. In addition, the feed (C-333-A & C-337-A), withdrawal (C-310 & C-315), and other support facilities (see support facilities discussion above) may continue operating for a short time after the enrichment cascade equipment is shutdown to support cylinder transfers, product cylinder heel recovery, and provide support for ongoing operations in C-360. Upon de-lease, USEC will comply with 10 CFR 76.68 requirements and will make minor changes to the SAR to reflect that the specific facility has been shutdown and de-leased back to DOE regulatory oversight and that the remainder of the discussion is for historical purposes only and reflects the status of the equipment at shutdown.

In addition to the de-lease and return of PGDP process and support facilities (except C-360) to DOE regulatory oversight, USEC and DOE may agree to also turn over supporting programs, plans and services. This includes the same programs, plans and services that were required for the USEC/NRC Certificate of Compliance. Supporting programs, plans and services may be procured from the DOE in

accordance with de-lease contractual requirements and associated MBFA documents. The purchase of these services from the DOE will be similar to the existing process at the American Centrifuge Plant. If USEC determines that these supporting programs, plans and services are more efficiently and economically available from DOE, then the necessary PGDP application changes will be made to reflect these services are provided by DOE with USEC management oversight. The proposed changes to the programs, plans and services will be evaluated in accordance with the 10 CFR 76.68 plant change process. USEC will be responsible for ensuring that the programs, plans and services maintain compliance with all applicable NRC certificate requirements.

Anticipated Facility Conditions at Time of De-Lease:

C-331, C-333, C-335, and C-337 Facilities

Enrichment operations in these facilities will cease and be placed in shutdown conditions. Some non-enrichment equipment (feed/evacuation headers, purge and evacuation (P&E) pumps, etc.) may still be operated to support operations in the remaining operating facilities (feed, toll transfer and sampling, withdrawal) described below. On the effective date of facility de-lease the C-331, C-333, C-335 and C-337 enrichment equipment will be in a shutdown condition. Cascade shutdown cells/boosters and Freezer Sublimers (F/S) will have a UF_6 negative established and cells/equipment placed in long term shutdown per approved procedure. Deposits that meet the applicability of TRS 2.4.4.4 will be maintained or removed in accordance with the TSR and Application program and plan requirements until de-lease. P&E pumps may be operated to support maintenance operations within the facility or support ongoing process operations in other facilities. The following utilities will remain available for DOE use in the facilities: sanitary water, HPFW, recirculating cooling water (RCW), electrical power, steam, dry air and nitrogen. The de-lease demarcation for isolating of the utilities from the DOE facilities will be at a defined point outside the facility. In addition, public address (PA) and criticality accident alarm system (CAAS) services will remain available to DOE for their use. The de-lease isolation point for these systems will be within DOE's area. The systems will be modified if necessary to ensure that any DOE action that can disable the PA and/or CAAS will not impact the remainder of these systems.

The DOE may choose to de-lease the enrichment facilities separately from the feed (C-333-A and C-337-A), withdrawal (C-310 and C-315) and support (C-400, C-720, etc.) facilities. As mentioned above, some non-enrichment equipment (feed/evacuation headers, P&E pumps, wet air/seal exhaust pumps, surge drums, etc.) operations may continue for a period of time after the enrichment cascade equipment is shutdown. These operations will support USEC NRC-certified operations in remaining feed and/or withdrawal facilities. During most operations in C-360, the operation of the C-310 facility will be required. The C-310 facility is necessary to provide a vacuum source for purging piping/equipment of small quantities of UF_6 for the support of operations in the C-360 facility. In addition, the use of UF_6 and evacuation headers between the C-360 and C-310 facilities will be utilized. The headers pass through the C-337, C-335, and C-331 cascade buildings. In addition, the P&E pumps and surge drums in C-335 (or other cascade facility) may be necessary to support operations in C-360. Prior to de-lease of the cascade buildings, USEC will maintain control and operations of the headers and non-enrichment equipment. Following de-lease of the facilities, use of the headers and support equipment will be in accordance with the de-lease contractual requirements and the associated MBFA. It is anticipated that the MBFA documents will be similar to those utilized at PORTS during the de-lease and return of the plant facilities to DOE.

C-333-A and C-337-A Facilities

These facilities may continue to be operated after cessation of enrichment operations to perform various uranium handling operations such as heavy heel processing, cylinder repackaging, cylinder transfers, etc. While there are no known significant uranium deposits in the facilities there will be residual UF_6 and other uranium products (e.g., UO_2F_2), contained in the process piping, valves, and relief drums. The following

utilities will remain available for DOE use in the facilities: sanitary water (including fire water), electrical power, steam, dry air, and nitrogen. The de-lease demarcation for isolating of the utilities from the DOE facilities will be at a defined point outside the facility. In addition, PA and CAAS services will remain available to DOE for their use. The de-lease isolation point for these systems will be within DOE's area of control. The systems will be modified as necessary to ensure that any DOE action that can disable the PA and CAAS will not impact these systems in USEC leased space. After de-lease and return to DOE regulatory oversight, the surveillance and maintenance of these systems will be the responsibility of DOE.

Following de-lease of the enrichment cascade facilities, use of the headers and support equipment will be in accordance with the de-lease contractual requirements and the associated MBFA. It is anticipated that the MBFA documents will be similar to those utilized at PORTS during the de-lease and return of the plant facilities to DOE.

C-310 and C-315 Facilities

The C-310 product withdrawal and the purge cascade will continue to be operated after cessation of enrichment operations to perform various uranium handling operations such as continued operation of the purge cascade, cylinder repackaging, cylinder heavy heel transfers, and as a vacuum source for support of continued operations in C-360. The tails withdrawal operations in C-315 may be shut down or may operate for a limited period of time to facilitate non-fissile cylinder transfers. Shutdown equipment will have a UF_6 negative established in accordance with procedures. Deposits in the purge cascade that meet the applicability of TRS 2.4.4.4 will be maintained or removed in accordance with the TSR and Application program and plan requirements until de-lease. There will be residual UF_6 and other uranium products (e.g., UO_2F_2,) contained in the process piping, valves, and other equipment. After enrichment operations cease and the withdrawal facilities are de-leased and returned to DOE regulatory oversight, USEC will no longer perform withdrawal activities under the NRC Certification. The following utilities will remain available for DOE use in the facilities: sanitary water, HPFWS, electrical power, steam, dry air, and nitrogen. The de-lease demarcation for isolating of the utilities from the DOE facilities will be at a defined point outside the facility. In addition, PA and CAAS services will remain available to DOE for their use. The de-lease isolation point for these systems will be within DOE's area. The systems will be modified as necessary to ensure that any DOE action that can disable the PA and CAAS will not impact these systems in certified space.

Prior to de-lease of the cascade buildings, USEC will maintain control and operations of the headers and non-enrichment equipment. The enrichment cascade facilities could be de-leased without de-leasing either of the withdrawal facilities. Following de-lease of the enrichment cascade facilities, use of the headers and support equipment will be in accordance with the de-lease contractual requirements and the associated MBFA. It is anticipated that the MBFA documents will be similar to those utilized at PORTS during the de-lease and return of the plant facilities to DOE.

Support Facilities

The support facilities include chemical facilities (C-350, C-400, C-409, C-410-D, and C-410-K), technical services – laboratory facilities (C-709 and C-710), maintenance facilities (C-720, C-724, C-750), and plant utilities (switchyards, plant water including the high pressure fire water system [HPFWS], sanitary water, plant waste water, plant air, plant steam, and other smaller utilities). In addition, UF_6 cylinders are received, shipped, handled, transported, and stored in cylinder yards. The cylinders are stored in cylinder storage yards at the feed and withdrawal facilities and cylinder storage yards throughout the plant. The only TSRs associated with these support facilities are for those facilities with criticality accident alarm systems (CAAS). These facilities and associated equipment/systems (except HPFWS) do not have any other Section 2.0 TSRs associated with the operations performed in the facilities. The HPFWS have Section 2.0 TSRs associated with the enrichment cascade and withdrawal facilities. These HPFWS will be required to meet the TSR and SAR surveillance and maintenance

requirements as long as USEC has not de-leased the enrichment cascade and withdrawal facilities and returned the facilities to DOE regulatory oversight.

De-lease of some of these facilities/systems (switchyards, pump houses, HPFWS etc.) will be tied to the enrichment cascade facilities they directly support. The support facilities could be de-leased without de-leasing some of the UF_6 process facilities they support. Following de-lease of support facilities, any USEC use of the support facility equipment will be in accordance with the de-lease contractual requirements and the associated MBFA. It is anticipated that the MBFA documents will be similar to those utilized at PORTS during the de-lease and return of the plant facilities to DOE.

Enclosure 3
GDP 12-0007

USEC-01
Certificate Amendment Request

Deletion of Specific Technical Safety Requirements (TSRs) for the UF_6 Feed Facilities (C-333-A and C-337-A), Product and Tails Withdrawal Facilities (C-310 and C-315), Enrichment Cascade Facilities (C-331, C-333, C-335, and C-337), Deletion of Specific TSRs for Criticality Accident Alarm System (Non-Cascade Facilities), and Revision to TSR Section 3.0, Administrative Controls.

Removal/Insertion Instructions

Certificate Amendment Request Paducah Gaseous Diffusion Plant Letter GDP 12-0007 Removal/Insertion Instructions	
Remove Pages	Insert Pages
APPLICATION FOR UNITED STATES NUCLEAR REGULARTORY COMMISSION CERTIFICATION VOLUME 4	
TSR Section 2.2 Pages 2.2-2 through 2.2-34 TSR Section 2.3 Pages 2.3-2 through 2.3-51 TSR Section 2.4 Pages 2.4-2 through 2.4-47 TSR Section 2.6 Pages 2.6-2 through 2.6-8 TSR Section 3.0 Pages 3.0-4, 3.0-13, 3.0-15	TSR Section 2.2 None TSR Section 2.3 None TSR Section 2.4 None TSR Section 2.6 None TSR Section 3.0 Pages 3.0-4, 3.0-13, 3.0-15

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A and C-337-A)

2.2.1 OPERATIONAL MODES

Mode Number	Mode Name	Definition
1	Cylinder Handling	This mode includes UF6 cylinder movements, cylinder insertion to, and removal from autoclave.
2	Autoclave Open	This mode is applicable when the autoclave is open and one or more of the following operations may be occurring: cylinder pigtail connection or disconnection, inspections, or testing, cylinder valve operation or autoclave repair.
	Autoclave Out of Service	Autoclave open with a cylinder in the autoclave. No operation in progress.
3	Containment	The autoclave is closed and at least one isolation valve on each autoclave penetration line is closed.
4	Autoclave Closed	This mode is applicable when the autoclave is closed, and the steam supply and the vent line are isolated. Both valves XV-524 and PV-520 are closed. Valve XV-565 or XV-516 is closed. Various valve operations may occur for alarm investigation, repair, etc.
5	Heating	A UF6 cylinder is being heated inside a closed autoclave in preparation for removal of the UF6. Various valve operations may occur for alarm investigation, jetting, cylinder burping, etc.
	Feeding	Transfer of gaseous UF6 to the enrichment cascade from a cylinder containing liquid UF6. Various valve operations may occur for alarm investigation, cylinder burping, etc.
	Heeling	Removal of residual quantities of UF6 gas from a near-empty feed cylinder.
6	Not In Use	Equipment (autoclaves, etc.) is not in use. No UF6 is present (i.e., for autoclaves, no cylinder is present, for piping, pressure is less than atmospheric).
7	Controlled Feeding	Sublimation of UF6 from a cylinder under special heating limitations (maximum cylinder skin temperature 142.9°F and maximum cylinder UF6 vapor pressure <22 psia). Various valve operations may occur for alarm investigation, jetting, cylinder burping, etc.
8	Cold Feeding	Sublimation of UF6 from a cylinder without adding heat to the cylinder. The autoclave shell may be open or shut. Value XV-565 or XV-516 is closed if the autoclave is shut. Various valve operations may occur for alarm investigation, repair, etc.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.1 SAFETY LIMITS

2.2.1.1 AUTOCLAVE SHELL PRESSURE

SL 2.2.2.1: The autoclave shell pressure shall not exceed 220 psig.

APPLICABILITY: Modes: All

BASIS:

The autoclaves are designed and manufactured under ASME Boiler and Pressure Vessel code standards. As ASME pressure vessels, the autoclaves were hydrostatically tested at 150 percent of their 200 psig MAWP. The ASME code requires that the pressure transient during relief from this type of vessel not exceed 110% of MAWP. Thus, the safety limit is established at 220 psig (110% of MAWP). [SAR Sections 3.15.2.8; USQD 92-034]

2.2.2.2 UF_6 CYLINDER TEMPERATURE

SL 2.2.2.2: Cylinder temperature shall not exceed the values listed in the table below.

Cylinder Category	Temperature Safety Limit
A	250°F
B	245°F

APPLICABILITY: Modes: All

BASIS:

The only time that the potential exists for a UF_6 cylinder rupture is during the heating of the cylinder. During the heat-up cycle the UF_6 expands in volume. Ullage (or void volume) is lost due to heating a cylinder to an excessive temperature based upon the amount of UF_6 in the cylinder. A cylinder is assumed to fail at some point above its safety limit.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.2 SAFETY LIMITS

2.2.1.2 UF_6 CYLINDER TEMPERATURE (continued)

For Category A cylinders, the SL is established at 250°F. For Category B cylinders, the SL is established at 245°F. These safety limits are based on maintaining a minimum of 1% void volume at the safety limit temperature. The maximum autoclave temperature limited by the autoclave steam pressure control system LCS (LCS 2.2.3.3) is 235°F for Category A and 230°F for Category B cylinders. The limiting Category A or B cylinder, filled with high purity tails, has 3% void volume at the maximum autoclave temperature. When heated to the corresponding safety limit temperature, the limiting cylinder will still have at least 1% void volume.

These safety limits are above the 235°F design temperature of the "thin wall" cylinders. However, the design temperature is established only for the development of cylinder fill limits; it has no significance with respect to material strength.

The saturated steam pressures required to generate the safety limit cylinder temperatures are 12.5 psig and 15 psig for 245°F and 250°F respectively. [SAR Section 3.15.2.1, 4.3.2.2.2]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.1 AUTOCLAVE HIGH PRESSURE ISOLATION SYSTEM

LCS 2.2.3.1: The autoclave high pressure isolation system actuation pressure shall not exceed 15 psig.

LCO 2.2.3.1: The autoclave containment shall be operable.

APPLICABILITY: Modes: 3, 4, 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. One detection/initiation channel and/or one of two isolation valves on one or more isolable autoclave penetration inoperable.	A.1 Restore operability. NOTE: The current operating cycle may be completed, including transition between modes 2, 3, 4, and 5 or modes 2, 3, 4, and 7.	Prior to initiating a new operating cycle.
B. Both detection/initiation channels and/or both isolation valves on any one autoclave penetration inoperable.	B.1 Place the autoclave in mode 2 or 3.	1 hour
C. Steam leakage from autoclave containment.	C.1 Place the autoclave in mode 2 or 3.	1 hour

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.1 AUTOCLAVE HIGH PRESSURE ISOLATION SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.3.1-1	Visually inspect the autoclave head to shell locking ring for steam leakage.	Upon initial entry to modes 5 or 7 for each operating cycle.
SR 2.2.3.1-2	Functional test of each detection/initiation channel. System must actuate at or below 15 psig. Containment valves must close within 15 seconds of pressure switch actuation.	Quarterly
SR 2.2.3.1-3	Autoclave pressure decay test. Starting with an autoclave pressurized with air to a minimum of 90 psig, the maximum acceptable pressure drop is 10 psi in 1 hour. **OR** Autoclave leakrate test. The maximum acceptable leakage shall not exceed 12 scfm at a minimum pressure of 90 psig. The pressure decay test or the leakrate test shall be conducted twice, with valve positions selected to test the following isolation barriers. The following barriers shall be exposed to the autoclave volume with outboard pressures that are controlled and/or monitored: Inner Barrier / Outer Barrier PSE-518-* / XV-516-* / PSV-517-* / XV-565-* XV-524-* / PV-525-* / PV-520-* XV-532-* / CV-533-* XV-528-* / FV-529-* XV-503-* / CV-511-* / CV-504-* / CV-510-* / XV-505-*	Quarterly
SR 2.2.3.1-4	Calibration of each detection/initiation channel.	Annually
SR 2.2.3.1-5	Visual inspection of autoclave shell and head.	Annually
SR 2.2.3.1-6	Functional test of the interlock preventing autoclave opening on high pressure.	Quarterly

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.1 AUTOCLAVE HIGH PRESSURE ISOLATION SYSTEM (continued)

BASIS:

A pressure as high as 15 psig is assumed to indicate that a UF_6 release has occurred within the autoclave. This system places the autoclave into the containment mode, thus minimizing an external release of UF_6 (the primary path for which is the condensate drain line). The accident analysis assumes a 15-second valve closure time to minimize the amount of UF_6 and reaction products allowed to leak to the environment through the condensate drain line. This action also minimizes the water available for reaction with UF_6 by isolating the steam supply and condensate drains. The autoclave shell, valves, and external piping out to the second isolation valve were credited in the "cylinder rupture inside an operating autoclave" scenario for containing the reaction products resulting from the release and its reaction with autoclave steam and water.

These controls ensure that the containment capability of the autoclave, as demonstrated by the pressure decay and/or leakrate test (SR 2.2.3.1-3), is not compromised. [SAR Section 3.15.2.1, 3.15.2.3, 4.3.2.2.2, 4.3.2.2.13, 4.3.2.2.14]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.2 AUTOCLAVE PRESSURE RELIEF SYSTEM

LCS 2.2.3.2: The actuation pressure of the autoclave pressure relief system shall not exceed 210 psig.

LCO 2.2.3.2: The autoclave pressure relief system shall be operable.

APPLICABILITY: Modes: 3, 4, 5, 7

ACTIONS:

Condition	Action	Completion Time
A. Pressure between the rupture disc and the relief valve greater than 5 psig.	A.1 Restore pressure to approximately atmospheric pressure. NOTE: The current operating cycle may be completed, including transition between modes 2, 3, 4, and 5 or modes 2, 3, 4, and 7.	Prior to starting a new operating cycle.
B. Autoclave pressure relief system inoperable.	B.1 Place the autoclave in mode 2 or 3.	Immediately

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.3.2-1	Replace the relief valve with a calibrated valve.	Annually
SR 2.2.3.2-2	Visually inspect the rupture disc for damage.	Annually
SR 2.2.3.2-3	Calibrate the pressure detection/indication channel that indicates the pressure between the rupture disc and relief valve.	Annually
SR 2.2.3.2-4	Verify that the block valve downstream from the relief devices is sealed open.	Annually

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.2 AUTOCLAVE PRESSURE RELIEF SYSTEM (continued)

BASIS:

This system prevents catastrophic failure of the autoclave, and subsequent uncontrolled UF_6 release, by allowing small (relative to the release associated with autoclave rupture), controlled releases in the unlikely event of concurrent UF_6 release and excessive autoclave water inventory.

The ASME Boiler and Pressure Vessel (B & PV) Code requires that overpressure relief be provided by a device stamped at or below the MAWP and sized such that the subsequent transient pressure will be limited to a maximum of 110% of MAWP when a single relief path is used. The ASME B & PV Code allows rupture discs to have a ± 5% burst tolerance. Rupture discs stamped at MAWP will therefore burst at or below 105% of MAWP. Thus, the LCS is set at 105% of MAWP. To comply with these standards, pressure relief devices are purchased and installed with stamped ratings at or below the MAWP. [SAR Section 3.15.2.8]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.3 AUTOCLAVE STEAM PRESSURE CONTROL SYSTEM

LCS 2.2.3.3: The actuation pressure of the autoclave steam pressure control system shall not exceed the values listed in the table below.

Cylinder Category	LCS
A	8 psig
B	6 psig

LCO 2.2.3.3: The autoclave steam pressure control system shall be operable.

APPLICABILITY: Modes: 5

ACTIONS:

Condition	Required Action	Completion Time
A. One detection/initiation channel inoperable, or one steam inlet block valve inoperable.	A.1 Restore operability. NOTE: The existing operating cycle, including transitions between modes 2, 3, 4, and 5, may be completed.	Prior to initiating a new operating cycle.
B. Both detection/initiation channels inoperable, or both steam inlet block valves inoperable, or the thermovent line isolation valve (XV-565-*) inoperable.	B.1 Place the autoclave in mode 2 or 3.	1 hour

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.2.3.3 AUTOCLAVE STEAM PRESSURE CONTROL SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.3.3-1	Functional test of each detection/initiation channel. System must activate and close the steam inlet block valves and the vent line isolation valve (XV-565-*) at a pressure at or below the current LCS pressure.	Quarterly
SR 2.2.3.3-2	Reset and functionally test the system trip setpoint to 6 psig or below.	Prior to entering mode 5 with a Category B cylinder (if only one is to be heated) or with the first Category B cylinder of a series of Category B cylinders to be heated.
SR 2.2.3.3-3	Calibrate the autoclave steam pressure control system detection/initiation instrumentation.	Annually

BASIS:

The accident analysis assumed an initial UF_6 cylinder temperature of 240 °F, but due to the design temperature limitations of the "thin wall" 48 G cylinder (-40 to 235 °F), the category A cylinder steam pressure is limited to 8 psig (235 °F). By limiting steam pressure to 8 or 6 psig and therefore steam temperature to 235°F or 230°F, this system provides an indirect means of controlling cylinder temperature below the stated safety limits. This in turn limits not only the UF_6 vapor pressure within the cylinder, but also the volume (density) of liquid UF_6, preventing loss of ullage and overpressurization.

The accident analysis assumes no valve closure time for this system. However, the functional test surveillance requirement associated with TSR 2.2.3.1 verifies valve closure times are within accident analysis assumptions for other accident scenarios on a quarterly basis. [SAR Section 3.15.2.1, 3.15.2.4, 4.3.2.2.2, 4.3.2.2.4, 4.3.2.2.10, 4.3.2.2.13, 4.3.2.2.14, 4.3.2.2.15]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.1 UF_6 RELEASE DETECTION SYSTEM - AUTOCLAVE HEATED HOUSINGS, PIPING TRENCH, JET STATION, WEST WALL DETECTORS (C-337-A ONLY)

LCO 2.2.4.1: UF_6 release detection system shall be operable.

APPLICABILITY: Modes: 4, 5, 7, 8

ACTIONS:

Condition	Required Action	Completion Time
A. The UF_6 release detection system is inoperable.	A.1 Perform UF_6 smoke watch on area affected by PGLD detection head inoperability. TSR 1.6.2.2(d) is not applicable.	Initiate within 1 hour and continuously thereafter until operability restored.
B. Action item A not satisfactorily accomplished.	B.1 Place the area affected by the outage in the following mode as applicable: mode 2 or 3 for autoclaves and mode 6 for piping.	Immediately

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.1-1	Test each UF_6 release detection head to verify it will detect "smoke."	Quarterly

BASIS:

The reaction of UF_6 and water (free atmospheric humidity) in the case of a UF_6 release produces uranyl fluoride (UO_2F_2) as particulates and hydrogen fluoride (HF) as a gas which will hydrate. The UO_2F_2 and $HF*x(H_2O)$ are highly visible as "smoke." This system detects the presence of this "smoke" and alarms in the local autoclave area, the OMR, and the associated ACR to alert operating personnel to initiate corrective/mitigative action. Proper actuation of the detector heads is ensured by smoke testing with a known maximum concentration of smoke. The relationship of the test smoke to UF_6 outleakage is also known with regard to particle size and mass concentration. [SAR Sections 3.15.7.3 and 4.3.2.2.4]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.2 AUTOCLAVE WATER INVENTORY CONTROL SYSTEM

LCO 2.2.4.2: The autoclave water inventory control system shall be operable.

APPLICABILITY: Modes: 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. One detection/initiation channel inoperable, or one steam inlet block valve inoperable.	A.1 Restore operability. NOTE: The current operating cycle may be completed, including transition between modes 2, 3, 4, and 5 or modes 2, 3, 4, and 7.	Prior to initiating a new operating cycle.
B. Both detection/initiation channels inoperable.	B.1 Place the autoclave in mode 4 or 2.	1 hour
C. Both steam inlet block valves (XV-524 and PV-520) inoperable or the vent line block valve (XV-565-*) inoperable.	C.1 Place the autoclave in mode 2 or 3.	1 hour

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.2-1	Test the autoclave water inventory control system to verify that each detection/initiation channel will activate and close the steam inlet block valves (XV-524 and PV-520) and the vent line block valve (XV-565-*) upon detection of standing water in the condensate drain line to the level at or below the autoclave shell.	Quarterly

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.2 AUTOCLAVE WATER INVENTORY CONTROL SYSTEM (continued)

BASIS:

The autoclave water inventory control system limits the amount of water in the autoclave, which is the most effective method of limiting the maximum pressure generated from a large release of UF_6 inside an autoclave. The closure of the vent line block valve (XV-565) is required to prevent water/steam backflow to the autoclave from other autoclaves via the common vent header.

The autoclave water inventory control system also minimizes the possibility of water mixing with fissile uranium in amounts sufficient to cause a criticality incident in the autoclave in the event of a large UF_6 release into the autoclave.

The accident analysis assumes no valve closure time for this system. However, the functional test surveillance requirement associated with TSR 2.2.3.1 verifies valve closure times are within accident analysis assumptions for other accident scenarios on a quarterly basis. [SAR Section 3.15.2.5, 4.3.2.2.13, 4.3.2.2.14]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.3 CRITICALITY ACCIDENT ALARM SYSTEM

LCO 2.2.4.3a: Criticality accident detection coverage shall be operable.

APPLICABILITY: In areas, equipment, or processes which contain greater than 700 grams of ^{235}U at an enrichment greater than or equal to 1.0 wt % ^{235}U.

ACTIONS:

Condition	Required Action	Completion Time
A. Areas, equipment, or processes not covered by criticality accident detection.	A.1 Implement the following for areas, equipment, or processes applicable to this LCO and that are not otherwise covered by criticality accident detection. A.1.1 Discontinue movement of cylinders containing UF_6 enriched to ≥ 1 wt % ^{235}U. AND A.1.2 Cylinder processing with UF_6 enriched to ≥ 1 wt % ^{235}U will be discontinued. [In-progress cylinder operating cycle(s) may be completed, stopped and/or re-started as necessary, as long as the in-progress autoclave(s) remain in mode 5, 7, or 8. However, these autoclaves may be placed in mode 2 at any time.] AND A.1.3 Discontinue movement of uranium enriched to ≥ 1 wt % ^{235}U. AND A.2.1 Evacuate area within the area applicable to this LCO not covered by criticality accident detection. AND A.2.2 Restrict access to area evacuated in A.2.1. AND A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification, such as a device that will alarm on sensing a 10 mr/hr dose rate.	Immediately Immediately Immediately
B. Areas, equipment, or processes not covered by criticality accident detection.	B.1.1 Restore criticality accident detection by installing portable CAAS unit providing required criticality accident detection and same alarms as fixed unit. OR B.1.2 Restore criticality accident detection to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.3 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.3a-1	Calibrate CAAS system equipment.	Annually

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. The design of the system, three detection modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the feed facilities are associated with movement of fissionable materials. The action items maintain the facility in steady state operations to limit the potential for these concerns to the extent possible. Providing another means of coverage (i.e., portable detector/alarm, personal alarm device, etc.), restricting operations, or restricting access to the area in the event of the loss of detection will establish protection. [SAR Section 3.15.7.1, 4.3.2.6]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.3 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.2.4.3b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Implement the following for areas, equipment, or processes where a criticality accident could result in a maximum foreseeable dose exceeding 12 rad in the area of inaudibility and LCO 2.2.4.3a or 2.4.4.2a applies. A.1.1 Discontinue movement of cylinders containing UF_6 enriched to $\geq$ 1 wt % ^{235}U. AND A.1.2 Cylinder processing with UF_6 enriched to $\geq$ 1 wt % ^{235}U will be discontinued. [In-progress cylinder operating cycle(s) may be completed, stopped and/or re-started as necessary, as long as the in-progress autoclave(s) remain in mode 5, 7, or 8. However, these autoclaves may be placed in mode 2 at any time.] AND A.1.3 Perform Required Actions A.1.1 through A.1.6 of TSR 2.4.4.2b. AND A.1.4 Discontinue movement of uranium enriched to $\geq$ 1 wt % ^{235}U. AND A.2.1 Evacuate area of inaudibility applicable to this LCO. AND A.2.2 Restrict access to area evacuated in A.2.1. AND A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification, such as a device that will alarm on sensing a 10 mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately Immediately Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	Prior to reinitiating activities

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.3 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.3b-1	Test the CAAS and building horns.	Annually
SR 2.2.4.3b-2	Verify that the CAAS air accumulator supply pressure to the building horns is greater than or equal to that necessary to sound all building horns for at least 120 seconds based on the number of accumulators in service. (Note: The air accumulator supply for C-333-A is in C-333 and the supply for C-337-A is in C-337.) Number of accumulators in service — Minimum pressure 4 — 137 psig 3 — 143 psig	Quarterly

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detection modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the feed facilities are associated with movement of fissionable materials. The action items maintain the facility in steady state operations to limit the potential for these concerns to the extent possible. The alarm signal is provided by sounding building horns which sound upon a signal from any cluster. Providing another means of coverage (i.e., portable detector/alarm, personal alarm device, etc.), restricting operations, or restricting access to the area in the event of the loss of alarms will establish protection.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.3 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

BASIS (continued):

The CAAS air accumulators provide for 120 seconds of horn actuation when at their minimum acceptable pressure based on the number of accumulators in service. The air accumulator supply for C-333-A is in C-333 and the supply for C-337-A is in C-337.

The annual surveillance of the CAAS building horns consists of placing the cluster in the test mode with a keyswitch, and manually causing two detector modules to generate radiation readings above the alarm setpoint. The cluster electronics determines that this meets the high radiation alarm criteria and propagates a high radiation alarm signal to the rest of the system. This signal activates the high radiation alarm light and bell in C-300 and activates the building CAAS horns. Each horn is qualitatively verified to be operating. This test is a horn functional test and each module combination is tested to generate the high radiation signal. [SAR Section 3.15.7.1, 4.3.2.6, 5.2.2.5]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.4 CYLINDER HEATING - CYLINDER ACCOUNTABILITY WEIGHT

LCO 2.2.4.4: Except as allowed by TSR 2.2.4.5, cylinder accountability (net) weight shall be verified less than or equal to the "Max. Fill Limit for Shipment" for cylinders other than tails cylinders and "Max. Fill Limit for In-Plant Tails Storage" for tails cylinders stated in TSR Section 2.2, Appendix A prior to heating the cylinder.

APPLICABILITY: Modes: 5

ACTIONS:

Condition	Required Action	Completion Time
A. Accountability weight exceeds the Maximum Fill Limit for Shipment for cylinders other than tails cylinders, or the Maximum Fill Limit for In Plant Tails Storage for tails cylinders.	A.1 Calculate the cylinder void volume (ullage) at a temperature of 230°F and/or 235°F. Use the stamped water weight as the basis of the actual volume of cylinders with certified volumes. Determine the category of the cylinder based on the following criteria: Cat. A Void volume ≥5% at 235°F or Void volume ≥3% at 235°F for cylinders filled with high purity tails Cat. B Void volume ≥5% at 230°F or Void volume ≥3% at 230°F for cylinders filled with high purity tails Cat. C Void volume <5% at 230°F or Void volume <3% at 230°F for cylinders filled with high purity tails AND A.2.1 Set the Autoclave Steam Pressure Control System setpoint consistent with the cylinder category per TSR 2.2.3.3 for a Category A or B cylinder. OR A.2.2 Administratively control the Category C cylinder to prevent heating in mode 5. NOTE: Category C cylinders may be processed using Mode 7 or Mode 8. TSR 1.6.2.2(d) is not applicable.	Prior to entering mode 5

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.4 CYLINDER HEATING - CYLINDER ACCOUNTABILITY WEIGHT (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.4-1	Verify cylinder accountability (net) weight is less than or equal to the "Max. Fill Limit for Shipment" for cylinders other than tails cylinders and "Max. Fill Limit for In-Plant Tails Storage" for tails cylinders stated in TSR Section 2.2, Appendix A.	Prior to the first entry into Mode 5 of each operating cycle.

BASIS:

The thermal expansion coefficient of liquid UF_6 is such that the density of the liquid decreases dramatically as the liquid temperature increases. This difference in liquid density could allow more UF_6 to be drained into a cylinder at fill temperatures (typically 160°F) than can fit in the cylinder once it is heated to liquefaction temperature (typically 220°F). As an example, 22,870 lb of liquid UF_6 placed in a 10-ton product cylinder (fill limit = 21,030 lb) at normal cylinder fill temperature would occupy only 102.1 ft^3 of the available 108.9 ft^3. However, when that same cylinder is heated to normal liquefaction temperature, the liquid UF_6 would completely fill the cylinder and could potentially cause hydraulic pressures to develop inside the cylinder.

However, cylinders filled slightly beyond their standard fill limit can still be safely liquefied provided 5% ullage (3% for high-purity tails) is maintained. The standard fill limits (Appendix A) are based upon the cylinder's minimum volume and its design temperature. Thus, it may be the case that (accounting for the cylinder's actual volume determined from the water capacity stamped on its nameplate) liquefaction at some temperature equal to or less than the cylinder's design temperature may be achieved while still providing the required ullage for safety. [USEC-651, Revision 7, Section 10] The calculations of required action A.1 may conclude that the cylinder, based upon its actual volume, has sufficient void volume to permit heating to 235°F. In those cases, required action A.2 would have the Autoclave Steam Pressure Control system setpoint changed to 8 psig (235°F) which is the normal setpoint for this system (see TSR 2.2.3.3). Required Action A.2 becomes unnecessary in these cases provided the surveillance requirements associated with TSR 2.2.3.3 are current. [USEC-651, Revision 7]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.4 CYLINDER HEATING - CYLINDER ACCOUNTABILITY WEIGHT (continued)

BASIS (continued):

The minimum autoclave temperature/pressure setpoint established in A.2.1 assures that the nominal autoclave temperature will not fall below 220°F and nominal pressure will remain above 2.5 psig. These values are the actual equipment operating conditions; instrument uncertainty, drift etc. are not to be applied to these values. [SAR Section 4.3.2.2.6]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.5 CYLINDER HEATING - HEATING LIMITATIONS FOR CERTAIN CYLINDERS WITHOUT CERTIFIED VOLUMES

LCO 2.2.4.5: Heating of the cylinders listed in the table below shall be governed by the limiting conditions specified in the table.

Cylinder Type	Cylinder Serial/Identification Numbers	Limiting Conditions
48 T	5001 - 9230	Do not heat.
48 O	10000 - 16601	Do not heat.
48 OM	16602 - 18801	Verify that the calculated volume of the cylinder, based on measured dimensions, is greater than 135 ft^3 and fill weight of UF_6 is less than 26,000 pounds.
48 OM	100001 - 111820	Verify that the calculated volume of the cylinder, based on measured dimensions, is greater than 135 ft^3 and fill weight of UF_6 is less than 26,000 pounds.
30 A	Concave Hd	Verify that the calculated volume of the cylinder, based on measured dimensions is greater than 25.65 ft^3 and fill weight of UF_6 is less than 4939 pounds.
48 A	1 – 1000 3001 - 3365	Verify that the calculated volume of the cylinder, based on measured dimensions is greater than 108.9 ft^3 and fill weight of UF_6 is less than 20, 973 pounds.
48 F	9501 – 9530 9601-9660	Verify that the calculated volume of the cylinder, based on measured dimensions is greater than 140 ft^3 and fill weight of UF_6 is less than 26, 963 pounds.
48 OM Allied	AC0001 – AC0400	Verify that the calculated volume of the cylinder, based on measured cylinder dimensions and UF_6 net weight provides greater than 7% ullage when heated to 235°F.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

APPLICABILITY: Modes: 5

ACTIONS:

Condition	Required Action	Completion Time
A. 48T or 48O cylinder listed in table above selected for heating or 30A, 48A, 48F, or 48OM cylinder listed in table above selected for heating does not meet the volume or weight requirements specified.	A.1 Administratively control the category C cylinder to prevent heating in Mode 5. NOTE: Category C cylinders may be processed using Mode 7 or 8.	Immediately

SURVEILLANCE REQUIREMENTS: None.

BASIS:

Certain serial number ranges of model 48T and 48O cylinders lack a certified volume and certain 48OM cylinders may not meet the volume or weight requirements specified. The mechanism by which these cylinders will be emptied is by controlled/cold feeding, whereby the material is sublimed out of the cylinder at temperatures below the UF_6 triple point.

Certain serial number ranges for 30A, 48A and 48F cylinders also lack certified volumes, but can be safely liquefied provided there is sufficient margin to hydraulic rupture provided by the ullage in the cylinder. Calculations have shown that 30A, 48A, and 48F cylinders respectively containing less than 4950, 21,030 and 27,030 lbs. and which have a volume greater than 25.65, 108.9 and 140 ft^3 (the values listed in ANSI-N14.1 as the minimum volume for this cylinder class) will contain in excess of 7% ullage when heated 235°F. Because these cylinders lack a certified volume, established by the manufacturer at the time of construction, the dimensions of each cylinder to be heated must be measured and these dimensions used in a calculation to show the actual volume of the cylinder exceeds the established minimum volume specified above. The 7% ullage assured by the limits of this TSR provides a greater margin to hydraulic rupture than the 5% and 3% ullage required by TSR 2.1.4.6 in order to account for the fact that measured volumes are being used rather than a certified volume.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

Certain serial number ranges for 48 OM cylinders also lack certified volumes but can be safely liquefied provided there is sufficient margin to hydraulic rupture provided by the ullage in the cylinder. Calculations have shown that 48 OM cylinders containing less than 26,000 lbs and which have a volume greater than 135 ft^3 (the value listed in ANSI-N14.1 as the minimum volume for this cylinder class) will contain in excess of 7% ullage when heated to 235°F. Because these cylinders lack a certified volume, established by the manufacturer at the time of construction, the dimensions of each cylinder to be heated must be measured and these dimensions used in a calculation to show the actual volume of the cylinder exceeds 135 ft^3. The 7% ullage assured by the limits of this TSR provides a greater margin to hydraulic rupture than the 5% and 3% ullage required by TSR 2.2.4.4 in order to account for the fact that measured volumes are being used rather than a certified volume.

There is another type of 48 OM cylinders manufactured before ANSI-N14.1 was initially issued in 1971 that also lack certified volumes. These cylinders can be safely liquefied provided there is sufficient margin to hydraulic rupture provided by the ullage in the cylinder. Specifications for the 48 OM Allied cylinders were not included in the ANSI standard until 1987 and required a minimum volume of 140 ft^3. The 48 OM Allied cylinders with serial numbers AC0001 through AC0400 do not meet the 140 ft^3 minimum volume specified in ANSI-N14.1. Measurements and calculations have shown the 48 OM Allied cylinders with serial numbers AC0001 through AC0400 have cylinder volumes that generally range between 137.06 to 139.37 ft^3. Because the cylinders lack a certified volume, established by the manufacturer at the time of construction, the dimensions of each cylinder to be heated must be measured and these dimensions used in a calculation to show actual volume. Using the UF_6 net weight, the calculated cylinder volume, and UF_6 heated to 235°F the actual cylinder ullage is determined. The 7% ullage assured by the limits of this TSR provides greater margin to hydraulic rupture than the 5% and 3% ullage required by TSR 2.1.4.6 in order to account for the fact that measured volumes are being used rather than a certified volume

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.6 CYLINDER HEATING - CYLINDER PRE-HEAT INSPECTION

LCO 2.2.4.6: UF_6 cylinders shall pass cylinder pre-heat inspection.

APPLICABILITY: Modes: 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. Cylinder fails pre-heat visual inspection.	A.1 Repair/refurbish and test (if necessary) the cylinder in accordance with SAR Section 3.7.1 and SAR Figure 3.7-1. OR	Prior to entering mode 5 or 7 with the subject cylinder.
	A.2. Designate subject cylinder as Category C cylinder.	Prior to entering mode 7 or 8 with the subject cylinder.

SURVEILLANCE REQUIREMENTS:

Surveillance	Frequency
SR 2.2.4.6-1 Cylinder visual inspection for damage.	Prior to initial entry into mode 5 or 7 of each operating cycle.

BASIS:

Depending upon the degree of damage (detected during the pre-use inspection), a cylinder may or may not be capable of withstanding its hydropressure. A UF_6 cylinder is removed from service for repair or replacement when it has leaks, excessive corrosion, cracks, bulges, dents, gouges, defective valves, damaged stiffening rings or skirts, or other conditions that, in the judgement of the inspector, renders it unsafe or unserviceable. Some types of cylinder damage and/or deformities are acceptable as-is or after repair.

If a cylinder does not pass inspection, an evaluation by qualified personnel (in accordance with SAR 3.7.1) is required before the cylinder is placed back into service. This evaluation will determine if the cylinder can be emptied by heating in the mode 5 as a Category A or B cylinder, emptied by heating in the controlled feed mode 7 as a Category C cylinder, or emptied in the cold feed mode 8 and not heated at all. The evaluation may also require some repair/refurbishment and testing prior to returning the cylinder to service. Cylinders that meet the requirements for Category A or B cylinders may be fed in the controlled feed mode 7 or cold feed mode 8.

Category C cylinders, which are not acceptable for heating to a liquid state in Mode 5, can be emptied by controlled feeding or cold feeding; whereby the material is sublimed out of the cylinder at temperatures below the UF_6 triple point for controlled feeding and at ambient temperature for cold feeding. Category C cylinders must also satisfactorily pass TSR 2.2.4.7 surveillance requirement SR 2.2.4.7-1 (cylinder cold pressure check) before they can be heated in the controlled feeding mode. Passing the cylinder cold pressure check provides confidence that the cylinder integrity is adequate for limited heating that occurs during controlled feeding. A Category C cylinder that does not meet the cold pressure check can be fed using the cold feeding mode. [SAR 4.3.2.2.9, 4.3.2.2.14]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.7 CYLINDER HEATING - CYLINDER COLD PRESSURE

LCO 2.2.4.7: The cylinder cold pressure shall be less than or equal to 10 psia.

APPLICABILITY: Modes: 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. Cylinder cold pressure is greater than 10 psia.	A.1 "Cold burp" (or evacuate) cylinder to establish cold pressure less than or equal to 10 psia.	Prior to entering mode 5 or 7 with the subject cylinder.

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.7-1	Determine cylinder cold pressure.	Prior to entering mode 5 or 7 with the subject cylinder.
SR 2.2.4.7-2	Calibrate the pressure detection/indication channel used to determine cylinder pressure.	Annually

BASIS:

The cylinder cold pressure check gives a mechanism to detect the presence of excessive amounts of gaseous impurities in the cylinder. Cylinders with cold pressures of 10 psia, when heated to 235°F, could have a pressure as high as 130 psig (well below the cylinders' hydrostatic test pressure). The pressure is due to increased UF_6 vapor pressure and the shrinking available volume for and the temperature increase of the gaseous impurities. The actual cylinder pressure would be lower, however, since some of the typical impurities are soluble in liquid UF_6.

Category C cylinders, which are not acceptable for heating to a liquid state in Mode 5, can be emptied by controlled feeding or cold feeding; whereby the material is sublimed out of the cylinder at temperatures below the UF_6 triple point for controlled feeding and at ambient temperature for cold feeding. Category C cylinders must also satisfactorily pass TSR 2.2.4.7 surveillance requirement SR 2.2.4.7-1 (cylinder cold pressure check) before they can be heated in the controlled feeding mode. Passing the cylinder cold pressure check provides confidence that the cylinder integrity is adequate for limited heating that occurs during controlled feeding. A Category C cylinder that does not meet the cold pressure check can be fed using the cold feeding mode. Cylinders that are to be fed with the cold feeding mode do not have to have a cold pressure check. [SAR Section 4.3.2.2.7, 4.3.2.2.14]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.8 CYLINDER HANDLING - CYLINDER DISCONNECTION

LCO 2.2.4.8: The cylinder valve shall be closed prior to disconnecting the cylinder from the pigtail.

APPLICABILITY: Modes: 2

ACTIONS:

Condition	Required Action	Completion Time
A. Cylinder valve cannot be closed.	A.1 Establish cylinder pressure below atmospheric pressure AND A.2 Cap the open connections.	Prior to disconnecting either end of the pigtail. After disconnecting either end of the pigtail.

SURVEILLANCE REQUIREMENTS: None

BASIS:

Closing the cylinder valve prior to disconnecting the cylinder from the manifold prevents UF_6 release from an open source. On rare occasions, it is discovered that the cylinder valve, for one reason or another, cannot be closed and seated as evidenced by the pigtail pressure rising after evacuation. In those instances, the safest course of action is to allow the cylinder to cool below atmosphere, disconnect the cylinder from the manifold, and cap the open connections to minimize UF_6 outleakage.

The cylinder pressure indication channel is calibrated in SR 2.2.4.7-2.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.9 HEATING UF_6 PLUGS

LCO 2.2.4.9: Direct heat sources shall not be applied to UF_6 plugs until flow clarity in the system has been assured.

APPLICABILITY: At all times

ACTIONS:

Condition	Required Action	Completion Time
A. Direct heat source applied to a UF_6 plug.	A.1 Discontinue heating the plug.	Immediately

SURVEILLANCE REQUIREMENTS: None.

BASIS:

Application of external heat to the middle portion of the plug can melt the solid and develop large hydraulic forces in the pipe and ends of the plug, creating the potential for a UF_6 release due to pipe rupture.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.10 CYLINDER HEATING - VALVE CLARITY

LCO 2.2.4.10: Cylinder valve clarity shall be demonstrated prior to initial heating of a cylinder.

APPLICABILITY: Modes: 4, 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. Cylinder valve clarity cannot be demonstrated prior to initial heating.	A.1 Do not heat cylinder.	Immediately

SURVEILLANCE REQUIREMENTS: None.

BASIS:

The demonstration of cylinder valve clarity assures an open pathway between the cylinder void volume and the feed manifold. The open pathway assures that cylinder heating will not cause an unrelieved pressure buildup. In conjunction with other operating controls on cylinder inventory and heating, this requirement significantly reduces the possibility of cylinder rupture. The methodology and criteria for demonstrating valve clarity are maintained in procedures.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.11 CYLINDER HEATING - VALVE CLARITY/HEATING CYCLE INTERRUPTIONS

LCO 2.2.4.11: During the operating (feeding and heeling) cycle, cylinder valve clarity shall be demonstrated immediately prior to heating a cylinder following heating interruptions.

APPLICABILITY: Modes: 4, 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. Cylinder valve clarity cannot be demonstrated prior to heating following heating interruption.	A.1 Terminate operating cycle. Do not heat cylinder until valve clarity is established.	Immediately

SURVEILLANCE REQUIREMENTS: None

BASIS:

The demonstration of cylinder valve clarity assures an open pathway between the cylinder void and the autoclave UF_6 manifold. The open pathway assures that cylinder heating will not cause an unrelieved pressure buildup. In conjunction with other operating controls on cylinder inventory and heating, this requirement reduces the possibility of cylinder rupture. The methodology and criteria for demonstrating valve clarity are maintained in procedures.

Following an interrupted cylinder heating cycle, it is possible to have liquid UF_6 present inside the cylinder. Therefore, following the demonstration of valve clarity, heating of the cylinder must resume promptly to ensure that the liquid UF_6 does not solidify on the cylinder valve. Re-solidification of the UF_6 could eliminate the pathway between the cylinder void and the autoclave UF_6 manifold.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.11 CYLINDER HEATING - VALVE CLARITY/HEATING CYCLE INTERRUPTIONS (continued)

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.12 SCALES

LCO 2.2.4.12: The feed facility scale(s) used for verification of cylinder weight per LCO 2.2.4.4 and 2.1.4.6 shall be operable.

APPLICABILITY: Whenever the feed facility scale(s) is/are used for verification of cylinder weight.

ACTIONS:

Condition	Required Action	Completion Time
A. Scale discovered to be inoperable	A.1 Administratively control scale to prevent use.	Immediately

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.12-1	Calibrate NMC&A scale ID 19 (C-333-A) and 21 (C-337-A), to an adequate range and tolerance for the item being weighed, in accordance with NMC&A program requirements.	Annually
SR 2.2.4.12-2	Performs functional test of NMC&A scale ID 19 (C-333-A) and 21 (C-337-A) (i.e., check operation using test weights in accordance with NMC&A program requirements).	Daily

BASIS:

All cylinder weights are assumed to be within the tolerances assumed in the accident analysis. The calibration and testing of the scales to within the tolerances specified in the NMC&A program (which are much more stringent than the tolerances required by the accident analysis) assured that cylinder weights do not invalidate the accident analysis. [SAR Section 3.15.6.4, 4.3.2.2.6, 4.3.2.2.14]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.13 AUTOCLAVE MANUAL ISOLATION SYSTEM

LCO 2.2.4.13: The autoclave manual isolation system actuation devices shall be operable.

APPLICABILITY: Modes: 4, 5, 7, 8

ACTIONS:

Condition	Required Action	Completion Time
A. The actuation device located in the OMR is inoperable.	A.1 Position an operator such that the "see-and-flee" path provides access to the actuation device located at the cylinder yard crane bay exit. TSR 1.6.2.2d is not applicable.	4 hours
B. The actuation device located at the cylinder yard crane bay exit is inoperable.	B.1 Provide continuous stationing of an operator in the OMR. TSR 1.6.2.2d is not applicable.	4 hours
C. Both feed facility actuation devices inoperable.	C.1 Restore operability to at least one actuating device. TSR 1.6.2.2d is not applicable.	4 hours
D. Required action C not satisfactorily accomplished.	D.1 Place the autoclave in mode 2. OR D.2 Close containment valves XV-503, CV-504, XV-505, CV-511 and CV-510 on each autoclave. OR D.3.1 Establish radio communication with the associated Area Control Room in order to ensure immediate capability to actuate the Autoclave Manual Isolation System from the ACR in the event of a release. AND D.3.2 Restore operability of the Autoclave Manual Isolation System. TSR 1.6.2.2d is not applicable.	Immediately Immediately Immediately 72 hours
E. The actuation device located in the associated ACR is inoperable.	E.1 Ensure both actuation devices in appropriate feed facility are operable or appropriate required action A or B completed. AND E.2 Restore operability to ACR actuation device. TSR 1.6.2.2d is not applicable.	Immediately 30 days

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.13 AUTOCLAVE MANUAL ISOLATION SYSTEM

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.13-1	Perform functional test of the system actuation devices.	Annually

BASIS:

The autoclave manual isolation system provides the means to remotely isolate all facility autoclaves in the event of a UF_6 release from a line outside the autoclave containment boundary. The system consists of two (within the feed facilities) actuation devices located in the OMR and at the cylinder yard crane bay exit (the most likely point of egress from the autoclave area), and one remotely located actuation device in the associated cascade building ACR. Actuating the system will initiate closure of all containment valves for each of the autoclaves within the affected facility. In the event of a UF_6 release from a line outside the autoclave containment boundary, the operator, while exiting the facility in accordance with the "see-and-flee" policy, would actuate the system to isolate the release point from the UF_6 source and limit the amount of material released. Closure of valves XV-503, CV-504, XV-505, CV-511, and CV-510 isolate a cylinder within an autoclave from piping outside the containment boundary thereby eliminating the source of UF_6 available for release.

The autoclave manual isolation system closes the same containment valves as those described in TSR 2.2.3.1 for the autoclave high pressure isolation system. Therefore, the operability and surveillance requirements for these valves are included in Section 2.2.3.1. TSR surveillance 2.2.4.13-1 is not required to include the actual closure of all of the containment valves on all autoclaves simultaneously as this would require complete shutdown of the feed facility. The test will be performed by disabling the local actuation devices from the autoclaves not being tested and verifying the appropriate containment logic output from the programmable logic controller for the autoclaves being tested. Testing of all autoclaves in a facility will verify operability of the manual isolation system. Containment valve closure is verified quarterly by the performance of the TSR surveillance requirement 2.2.3.1-2.

If condition D is entered and action D.3 is selected from among the three options, the 72 hour time limitation for completing action D.3.2 provides a limit for how long the AMIS may be out of service under Condition D. If Required Action D.3.2 can not be satisfactorily accomplished within the 72 hour time limit, then Required Action D.1 or D.2 shall be taken immediately upon expiration of the 72 hour time period. [Note: Required Action D.1 or D.2 may be taken immediately upon entering Condition D, or any time thereafter to satisfy the required action for Condition D.] [SAR Sections 3.15.2.2, 4.3.2.2.4, and 4.3.2.2.10]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.14 HIGH CYLINDER PRESSURE SYSTEM

LCO 2.2.4.14: The high cylinder pressure system shall be operable.

APPLICABILITY: Modes 5, 7

ACTIONS:

Condition	Required Action	Completion Time
A. One of two steam isolation valves inoperable.	A.1 Restore isolation valve to operable status. NOTE: The current operating cycle may be completed.	Prior to initiating a new operating cycle.
B. High cylinder pressure system detection-initiation channel inoperable (excluding feeding or heeling).	B.1 Place autoclave in Mode 2, 3, or 4.	1 hour
C. High cylinder pressure system detection-initiation channel inoperable (feeding or heeling only).	C.1 Restore operability. NOTE: The current operating cycle may be completed.	Prior to initiating a new operating cycle.

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.14-1	Perform a functional test to verify the autoclave steam supply block valves will close when cylinder pressure exceeds the actuation pressure.	Quarterly
SR 2.2.4.14-2	Perform calibration of the high cylinder pressure system detection-initiation channel. System must actuate at or below 115 psia cylinder pressure for mode 5. System must actuate below 22 psia cylinder pressure for mode 7.	Annually

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.14 HIGH CYLINDER PRESSURE SYSTEM (continued)

BASIS:

The high cylinder pressure system is required to minimize the potential of primary system integrity failures during pressure increase events by tripping the steam supply when the MAWP of the cylinder being heated is reached. The 115 psia actuation pressure for heating Category A and B cylinders is based on the lowest MAWP of these cylinders and the below 22 psia actuation pressure for heating Category C cylinders is based on maintaining integrity of a cylinder containing solid/gaseous UF_6 (pressure below triple point). This system is a single channel system and is capable of performing its safety function independent of support systems. The heating of a UF_6 cylinder containing an excessive amount of light gases at normal heating temperatures could result in the internal cylinder pressure exceeding the hydrostatic test pressure and possibly create a UF_6 release in the autoclave.

In addition, in the event an over filled cylinder is heated in the autoclave the high cylinder pressure caused by the reduced void volume may be sufficient to exceed the actuation value and thereby stop the cylinder heating and prevent a possible rupture of the cylinder.

Prior to the controlled feeding (Mode 7) of a Category C cylinder, the normal feed/controlled feed selector switch must be placed in the "Controlled Feed" position to lower actuation pressure to assure that the UF6 does not liquefy.

The accident analysis assumes no valve closure time for this system. However, the functional test surveillance requirement associated with TSR 2.2.3.1 verifies valve closure times are within accident analysis assumptions for other accident scenarios on a quarterly basis. [SAR Sections 3.15.2.6, 4.3.2.2.6, 4.3.2.2.7, 4.3.2.2.9].

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.2.4.15 AUTOCLAVE TEMPERATURE CONTROL SYSTEM

LCO 2.2.4.15: The autoclave temperature control system shall be operable

APPLICABILITY: Mode 7

ACTIONS:

Condition	Required Action	Completion Time
A. One detection/initiation channel inoperable, or one steam inlet block valve inoperable.	A.1 Restore Operability. NOTE: The current operating cycle may be completed.	Prior to initiating a new operating cycle.
B. Both detection/initiation channels inoperable, or both steam inlet block valves inoperable, or the outboard thermovent line isolation valve (XV-565-*) is inoperable.	B.1 Place autoclave in Mode 2, 3, or 4.	1 hour

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.4.15-1	Perform a functional test to verify the autoclave steam supply block valves and the outboard thermovent line isolation valve will close within 15 seconds when the cylinder surface temperature exceeds the actuation temperature.	Quarterly
SR 2.2.4.15-2	Perform calibration of each autoclave temperature control system detection-initiation channel. System must actuate at or below 142.9°F.	Annually

BASIS:

The accident analysis assumed that the UF_6 cylinder temperature would remain below the UF_6 triple point temperature during the controlled feeding mode to ensure UF_6 within the cylinder does not liquefy. By limiting the cylinder surface temperature to 142.9°F or less, the contents will remain in a solid state with UF_6 vapor pressure in the cylinder less than 22 psia. Only cylinders that can successfully pass the cold pressure check (TSR 2.2.4.7 SR 2.2.4.7-1) can be heated in the controlled feeding mode. Passing the cold pressure check provides sufficient confidence that the cylinder integrity is adequate to withstand the low pressures that the cylinder will experience resulting from the limited heating that occurs during controlled feeding. Closure time testing for the steam supply isolation valves and outboard thermovent line isolation valve is accomplished under the surveillance requirements of TSR 2.2.3.1. Category C cylinders that do not pass the cylinder cold pressure check required by TSR 2.2.4.7 SR 2.2.4.7-1 can be fed using the cold feed mode of operation. [SAR 3.15.2.10, 4.3.2.2.2]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.5 GENERAL DESIGN FEATURES

2.2.5.1 UF_6 CYLINDER SLINGS AND LIFTING FIXTURES

DF 2.2.5.1: UF_6 cylinder slings and lifting fixtures are designed with a structural factor of safety of 5 to 1 based upon the material's ultimate tensile strength.

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.5.1-1	Visual inspection for defects	Prior to first use of shift
SR 2.2.5.1-2	Hands-on Inspection (no disassembly required)	Monthly
SR 2.2.5.1-3	Load test at a minimum of 100% of rated capacity.	Biennially

BASIS:

Slings, H-frames, etc used to handle liquid filled UF_6 cylinders are credited for prevention of the liquid cylinder drop and rupture accident scenario. Visual inspection will detect obvious defects which could cause the cylinder drop accident scenario. Surveillance requirements 1 and 2 are performed to meet the requirements of OSHA 1910.184. [SAR Sections 3.15.6.2 and 4.3.2.2.15]

2.2.5.2 CRANE DESIGN

DF 2.2.5.2: The UF_6 cylinder handling cranes are designed and maintained not to fail in a manner to cause primary system integrity failure.

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A

2.2.5 GENERAL DESIGN FEATURES

2.2.5.2 CRANE DESIGN (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.5.2-1	Visual inspection for defects	Prior to first use of shift
SR 2.2.5.2-2	Hands-on Inspection (no disassembly required)	Monthly
SR 2.2.5.2-3	Hands-on Inspection (some disassembly required)	Annually
SR 2.2.5.2-4	Load test at rated capacity and verify that the cranes do not allow a load to move (except compensatory movements) upon operator release of the controls.	Biennially

BASIS:

Cranes used to handle UF_6 cylinders are credited for prevention of dropping a cylinder on a liquid filled cylinder. Visual inspection will detect obvious defects which could cause the cylinder drop accident scenario. Surveillance requirements 1, 2, and 3 are performed to meet the requirements of OSHA 1910.179. [SAR Sections 3.15.6.2, 4.3.2.2.4, 4.3.2.2.10, 4.3.2.2.15, 4.3.2.5.2, and 4.3.2.5.3]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.5 GENERAL DESIGN FEATURES

2.2.5.3 UF_6 CYLINDERS

DF 2.2.5.3: UF_6 cylinders (2½-ton and larger) are as a minimum designed to a MAWP of 100 psig.

SURVEILLANCE REQUIREMENTS:

Surveillance	Frequency
SR 2.2.5.3-1 UF_6 cylinders (2½-ton and larger) shall be hydrostatically tested at 200% of MAWP. Note: Cylinders that are full of UF_6 but have an expired hydrostatic test may be heated for removal of the UF_6, but shall be hydrostatically tested prior to refilling.	5 years

BASIS:

UF_6 cylinder MAWP equal to or greater than 100 psig is an assumption used in several accident analysis scenarios. [SAR Sections 3.15.6.1, 4.3.2.2.2, 4.3.2.2.4, 4.3.2.2.6, 4.3.2.2.7, 4.3.2.2.9, 4.3.2.2.10, 4.3.2.5.2, and 4.3.2.5.3]

2.2.5.4 UF_6 CYLINDER PIGTAILS

DF 2.2.5.4: Pigtails are designed to withstand at least 400 psig.

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.5.4-1	Pigtails shall receive a post fabrication inspection and hydrostatic test to at least 400 psig.	Prior to initial use.

BASIS:

This design feature helps minimize the possibility of the initiator of the "pigtail failure" accident scenario (inside or outside an autoclave). [SAR Sections 3.15.6.1, 4.3.2.2.2, 4.3.2.2.4, 4.3.2.2.6, 4.3.2.2.7, 4.3.2.2.9, 4.3.2.2.10]

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

2.2.5 GENERAL DESIGN FEATURES

2.2.5.5 C-337-A JET STATION BARRIER FRAME

DF 2.2.5.5: The jet station barrier frame in C-337-A is designed to prevent a horizontal impact from a crane-carried load from resulting in UF_6 primary system failure in the C-337-A jet station piping.

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.2.5.5-1	The jet station barrier frame in C-337-A shall be inspected for structural defects.	5 years

BASIS:

The structural design characteristics of the C-337-A jet station barrier frame prevent a horizontal impact from a crane-carried load from causing a UF_6 primary system integrity failure in the C-337-A jet station piping. Analysis of the frame structure determined that a cylinder/barrier frame collision for fast speed conditions could cause the barrier frame to permanently deform, but in all analyzed collision scenarios the frame would not collapse or contact the UF_6 primary sytems piping [SAR Sections 3.15.2.9 and 4.3.2.2.10].

SECTION 2.2 SPECIFIC TSRs FOR UF_6 FEED FACILITIES (C-333-A AND C-337-A)

TSR 2.2 Appendix A
Maximum weight limits for UF_6 cylinders.

Model No.	Cylinder Nos. or Type	Max. Fill Limit for Shipment[1] (lbs UF_6)	Max. Fill Limit for In-Plant Tails Storage[2] (lbs UF_6)
12B	All	460	475
	Text Deleted		
30B	All	5020	—
	Text Deleted		
	Text Deleted		
	Text Deleted		
	Text Deleted		
	Text Deleted		
48G	121,926 - 149,999	26840	27920[3]
48G	160,000 and up	26840	27920[3]
48H	151,001- 154,144	27030	28000
48HX	150,001-151,000	27030	28000
48Y	All	27560	28000
48OM	111,821-121,925	26840	27920[3]
	Text Deleted		
48X	All	21030	21870

1. All fill limits for shipments are based on 5% free volume, 99.5% purity, and a maximum vaporization temperature of 250°F per USEC-651.
2. Fill limits for in-plant tails storage cylinders are based on 3% free volume and a maximum vaporization temperature of 235°F except for 48Y, 48HX, and 48H cylinders whose in-plant tails storage limits have been further reduced to ensure the maximum amount of UF_6 assumed in the accident analysis (28,000 lbs) is not exceeded.
3. The maximum fill limit for in-plant tails storage for the 48OM and 48G cylinders may be increased to the maximum of 28,000 lbs provided the cylinder will maintain a minimum 3 percent free volume when heated to 235°F based on the actual certified cylinder volume. Cylinders with 8,695-lb water capacity or greater may be filled with 28,000 lbs of high purity UF_6 tails and maintain a minimum 3 percent free volume when heated to 235°F.

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SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.1 OPERATIONAL MODES:

Mode Number	Mode Name	Definition
1	Cylinder Preparation or Removal	Movement of UF_6 cylinders to be filled (with crane and scale cart) installation at the withdrawal position, connection of the pigtail, and other activities required prior to draining UF_6 into the cylinder. Disconnection of the pigtail, UF_6 cylinder removal/ movements, and other activities required after draining UF_6 into the cylinder is complete. Starts when cylinder filling is complete and the liquid UF_6 sources are isolated (cylinder valve is closed and one or more of the following valves is closed: liquid block, emergency liquid block, other upstream valve).
2	Withdrawal	UF_6 product or tails is being removed from the enrichment cascade, compressed, condensed, and drained into UF_6 cylinders. Withdrawal system components in this mode may also be running off stream in preparation for or following withdrawal. Due to the nature of the withdrawal system layout, this consists of all or a portion of the following operations: <u>Compression Source</u> UF_6 withdrawal pumps are compressing the UF_6 gas from the enrichment cascade and pumping it to an on-stream UF_6 condenser. <u>Condenser and Accumulator</u> UF_6 condenser is cooling the compressed UF_6 gas to form liquid UF_6 and directing it to the on-stream UF_6 accumulator(s) and/or UF_6 cylinder. UF_6 accumulator is on-stream and may or may not contain liquid UF_6 that is draining or ready to drain to a receiving UF_6 cylinder in the withdrawal room. <u>Withdrawal Station</u> The receiving cylinder is filling with liquid UF_6. Starts when liquid UF_6 is valved to the cylinder and ends when the UF_6 condenser is isolated from the drain manifold and the cylinder valve is closed.

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.1 OPERATIONAL MODES (continued):

Mode Number	Mode Name	Definition
3	Standby	Withdrawal system components in standby are idle off-stream, and may or may not contain UF_6. The affected equipment has been isolated from the withdrawal system through either the automatic actions of the withdrawal system protective systems or the manual operation of isolating valve(s) as described below: Compression Source Suction and discharge valves shut, vent valve open or shut, and motor may or may not be running. Condenser and Accumulator Isolated from high pressure UF_6. Withdrawal Station Liquid block and/or emergency liquid block and cylinder valve shut. [Withdrawal position low voltage detector head closes all three valves on the affected position. Withdrawal room ceiling low voltage detector head closes the first two valves on all positions.]
4	Not In Use	Product and tails withdrawal equipment/positions are shut down and are not being used, as well as out of service for repair or testing.

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.2 SAFETY LIMITS

2.3.2.1 TEXT DELETED

2.3.2.2 UF6 CONDENSER COOLANT PRESSURE

SL 2.3.2.2: C-310: UF_6 condenser R-114 coolant pressure shall not exceed 220 psig.
C-315: UF_6 condenser R-114 coolant pressure shall not exceed 440 psig.

APPLICABILITY: Modes: All

BASIS:

The UF_6 condensers in C-310 and C-315 withdrawal areas are designed and manufactured under ASME code regulations with a MAWP of 400 psig. These pressure vessels were originally hydrostatically tested at 150 percent of the MAWP and are tested by nondestructive examination every five years to ensure their wall thicknesses meet or exceed the minimum wall thicknesses as specified by code. The safety limits are ultimately based on preserving the structural integrity of the UF_6 condensers. To minimize the potential for failure in the coolant system which could lead to a UF_6 release, the coolant system is designed to meet the ASME code requirement that the pressure transient not exceed 110% of MAWP. Although the UF_6 condenser has an MAWP of 400 psig, the C-310 coolant system safety limit is conservatively based on the R-114 condenser MAWP of 200 psig. Thus, the safety limit is established at 220 psig and 440 psig for the C-310 and C-315 UF_6 condenser R-114 systems, respectively (110% of MAWP). [SAR Sections 3.15.3.4, 3.15.4.6]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.3.3.1 TEXT DELETED

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.3.3.2 R-114 COOLANT OVERPRESSURE CONTROL SYSTEM

LCS 2.3.3.2: C-310: The R-114 coolant rupture discs shall actuate at or below 210 psig.
C-315: The R-114 coolant rupture discs shall actuate at or below 420 psig.

LCO 2.3.3.2: The R-114 coolant overpressure relief system shall be operable.

APPLICABILITY: Modes: 2, 3*, 4* (*Only when liquid R-114 has NOT been drained from the coolant system.)

ACTIONS:

Condition	Required Action	Completion Time
A. R-114 coolant overpressure relief system inoperable.	A.1 Assure the UF_6 condenser and any applicable compressors (C-315 only) are in mode 3 or 4. AND A.2 Drain liquid R-114 coolant from the system.	Immediately Immediately
B. The R-114 coolant overpressure relief system manual isolation valve found unsealed or closed.	B.1 Open the valve or verify it is open. AND B.2 Reseal the valve.	Immediately. 8 hours
C. Action item B not satisfactorily completed.	C.1 Place the UF_6 condenser and any applicable compressors (C-315 only) in mode 3 or 4. AND C.2 Drain liquid R-114 coolant from the system.	Immediately. Immediately

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.3.2-1	Visually inspect the R-114 coolant condenser overpressure control system manual isolation valve to ensure it is sealed open.	Quarterly

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.3 LIMITING CONTROL SETTINGS, LIMITING CONDITIONS FOR OPERATION, SURVEILLANCES

2.3.3.2 R-114 COOLANT OVERPRESSURE CONTROL SYSTEM (continued)

BASIS:

The ASME code requires that overpressure relief be provided such that the subsequent transient pressure will be limited to a maximum of 110% of MAWP when a single relief path is used. ASME code allows rupture discs stamped with a single rupture value to have a ± 5% burst tolerance. Such rupture discs stamped at MAWP will therefore burst at or below 105% of MAWP. Those rupture discs stamped with a burst pressure range include this tolerance, and the maximum stamped value must not exceed 105% of MAWP. Thus, the LCS is set at 105% of MAWP. To comply with these standards, pressure relief devices are purchased and installed on the coolant condensers with stamped ratings in accordance with the above criteria. To ensure that the R-114 coolant system is not overpressured when the relief system is not operable, the UF_6 condenser and applicable compressors (for C-315 only) are required to be in modes 3 or 4 and the R-114 coolant is drained from the affected system. [SAR Sections 3.15.3.4 and 3.15.4.6]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.1 UF_6 RELEASE DETECTION AND ISOLATION SYSTEM - LOW VOLTAGE ("NEW") SYSTEM AT THE UF_6 WITHDRAWAL STATIONS

LCO 2.3.4.1: The low voltage ("New") withdrawal station UF_6 release detection and isolation system shall be operable.

APPLICABILITY: Modes: When the applicable withdrawal station is in mode 2.

ACTIONS:

Condition	Action	Completion Time
A. The low voltage detector head at the C-310 position 3 or 4 or C-315 withdrawal station is inoperable OR Both low voltage detector heads at the C-310 withdrawal station position 5 are inoperable.	A.1 Ensure the ACR is manned and perform UF_6 smoke watch on area affected by PGLD detection head inoperability. AND A.2 Restore operability to the low voltage detector head. TSR 1.6.2.2(d) is not applicable.	Initiate within 1 hour and maintain continuously. 72 hours
B. One low voltage detector head at the C-310 withdrawal station position 5 is inoperable.	B.1 Restore operability.	72 hours
C. The low voltage detector head at the withdrawal station for C-310 position 3 or 4 or C-315 or both low voltage detector heads for C-310 position 5 are is inoperable and the ACR manual isolation button is inoperable.	C.1 Place the affected withdrawal station in mode 3.	1 hour
D. Either the liquid block valve or the emergency liquid block valve is inoperable.	D.1 Restore operability.	72 hours
E. Action Item A or B or D not satisfactorily accomplished.	E.1 Place the affected withdrawal station in mode 3.	1 hour
F. Both the liquid block valve and the emergency liquid block valve are inoperable.	F.1 Place the affected withdrawal station in mode 3.	1 hour
G. The cylinder valve closer mechanism is inoperable.	G.1 Place the affected withdrawal station in mode 3, closing the cylinder valve manually (valve closer may be removed).	1 hour

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.1 UF_6 RELEASE DETECTION AND ISOLATION SYSTEM - LOW VOLTAGE ("NEW") SYSTEM AT THE UF6 WITHDRAWAL STATIONS (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.1-1	Functional test by actuating each detector head with "smoke." Appropriate drain station valves (liquid block and emergency liquid block) must close within 15 seconds of detection. The cylinder valve must close within 30 seconds of detection.	Quarterly
SR 2.3.4.1-2	Functional test of the ACR "containment" push-button for each withdrawal station. Liquid block valve, emergency liquid block valve, and cylinder valve must close.	Quarterly
SR 2.3.4.1-3	Verify that nitrogen or backup air is available to power the receiving cylinder valve closer air motor in order to close the cylinder valve (pressure check).	Quarterly
SR 2.3.4.1-4	Verify that the automatic transfer from plant air to nitrogen is operable for the receiving cylinder valve closer.	Quarterly
SR 2.3.4.1-5	Verify that the check valve on the air supply line to the transfer cylinder valve closer air motor just upstream of the nitrogen or backup air supply interface is operable.	Quarterly

BASIS:

The reaction of UF_6 and water (free atmospheric humidity) in the case of a UF_6 release produces uranyl fluoride (UO_2F_2) as particulates and hydrogen fluoride (HF) as a gas which will hydrate. The UO_2F_2 and $HF*x(H_2O)$ are highly visible as "smoke." The UF_6 release detection safety system is provided on systems which contain gaseous or liquid UF_6 above atmospheric pressure. This system includes (1) automatic detection and isolation, and (2) manual isolation capability. Only the automatic isolation capability is required by the accident analysis to mitigate an event and satisfy the LCO. The system is designed to automatically close the liquid block, emergency liquid block, and cylinder valves if smoke is detected at the withdrawal position. The detection of a UF_6 release is based on detection of the smoke resulting from the reaction UF_6 with moisture in the air. To ensure that automatic isolation is initiated the detectors are smoke tested with a known maximum concentration of smoke. The relationship of the test smoke to UF_6 outleakage is also known with regard to particle size and mass concentration. Failure of the cylinder pigtail during the filling of a cylinder would result in a UF_6 release. Operation of this system to detect a UF_6 release and close the isolation valves (including the cylinder valve) within 30 seconds after

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.1 UF_6 RELEASE DETECTION AND ISOLATION SYSTEM - LOW VOLTAGE ("NEW") SYSTEM AT THE UF6 WITHDRAWAL STATIONS (continued)

BASIS (continued):

detection minimizes the quantity of UF_6 released. This system can be automatically actuated by a low voltage detector over each withdrawal position or it can be initiated manually via containment switches/pushbuttons located in the ACR. In the event the UF_6 detectors are inoperable, a smoke watch is established in the affected area to assure the process is monitored during the period permitted by the LCO. Upon sight or odor detection of a release, the "smoke watch" will contact the ACR operator who will initiate manual activation of the system via switches/pushbuttons located in the ACR. [SAR Sections 3.15.4.1, 4.3.2.2.4 and 4.3.2.2.11]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.2 UF_6 RELEASE DETECTION SYSTEM - LOW VOLTAGE SYSTEM AT THE UF_6 WITHDRAWAL ROOM CEILING

LCO 2.3.4.2: The low voltage ("New") withdrawal room ceiling UF_6 release detection (including at least half of the detector heads) and isolation system shall be operable.

APPLICABILITY: When one or more withdrawal stations is in mode 2.

ACTIONS:

Condition	Action	Completion Time
A.1 Less than half of the low voltage detector heads at the withdrawal room ceiling are operable. AND A.2 Low voltage detector heads in the housings of each withdrawal station in mode 2 are operable.	A.1 Restore operability to the low voltage detector head(s). TSR 1.6.2.2(d) is not applicable.	30 days
B.1 Less than half of the low voltage detector heads at the withdrawal room ceiling are operable. AND B.2 One or more low voltage detector heads in the housings of withdrawal stations in mode 2 are inoperable.	B.1 Assure the smoke watch is established per Action A.1 of TSR 2.3.4.1 AND B.2 Restore operability to the low voltage detector head(s). TSR 1.6.2.2(d) is not applicable.	Immediately 30 days
C. Action item A or B not satisfactorily accomplished.	C.1 Place the withdrawal station in mode 3.	1 hour

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.2-1	Functional test by actuating the detector head with "smoke." Appropriate drain station valves (liquid block, emergency liquid block) must close within 15 seconds of detection.	Quarterly

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.2 UF_6 RELEASE DETECTION SYSTEM - LOW VOLTAGE SYSTEM AT THE UF_6 WITHDRAWAL ROOM CEILING (continued)

BASIS:

The reaction of UF_6 and water (free atmospheric humidity) in the case of a UF_6 release produces uranyl fluoride (UO_2F_2) as particulates and hydrogen fluoride (HF) as a gas which will hydrate. The UO_2F_2 and $HF*x(H_2O)$ are highly visible as "smoke." The UF_6 release detection system is provided on systems which contain gaseous or liquid UF_6 above atmospheric pressure. The UF_6 detection system contains detectors which use an ionization chamber in which air is made conductive by the use of an alpha emitter. Proper actuation of the detector heads is ensured by smoke testing with a known maximum concentration of smoke. The relationship of the test smoke to UF_6 outleakage is also known with regard to particle size and mass concentration. [SAR Section 3.15.7.3].

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.3 UF_6 RELEASE DETECTION SYSTEM - NORMETEX PUMP

LCO 2.3.4.3: The Normetex pump UF_6 release detection and isolation system shall be operable.

APPLICABILITY: Modes: 2

ACTIONS:

Condition		Action		Completion Time
A.	One or more detection heads inoperable and/or the automatic trip/isolation circuits are inoperable.	A.1	Implement the following:	Initiate within 1 hour and maintain continuously.
		A.1.1	Ensure the ACR emergency stop button is operable.	
		AND		
		A.1.2	Perform UF_6 smoke watch on area affected by PGLD detection head and/or the automatic trip/isolation circuits inoperability.	
		AND		
		A.1.3	Ensure ACR is manned.	
		AND		
		A.2	Restore operability to the detection head(s) and/or the automatic trip/isolation circuits.	14 days
		TSR 1.6.2.2(d) is not applicable.		
B.	Action item A not satisfactorily accomplished.	B.1	Place the affected Normetex pump in mode 3.	1 hour
C.	The Normetex pump discharge valve is inoperable.	C.1	Place the affected Normetex pump in mode 3.	1 hour
		OR		
		C.2	Restrict mode 2 operations for the affected pump to evacuation service or running off-stream.	1 hour

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.3 UF_6 RELEASE DETECTION SYSTEM - NORMETEX PUMP (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.3-1	Functional test by actuating each combination of two adjacent detector heads with "smoke." The Normetex pump discharge valve must close and pump must trip.	Annually
SR 2.3.4.3-2	Functional test of the ACR emergency stop button. The Normetex pump discharge valve must close and pump must trip.	Annually

BASIS:

The reaction of UF_6 and water (free atmospheric humidity) in the case of a UF_6 release produces uranyl fluoride (UO_2F_2) as particulates and hydrogen fluoride (HF) as a gas which will hydrate. The UO_2F_2 and $HF*x(H_2O)$ are highly visible as "smoke." The UF_6 release detection safety system is provided on systems which contain gaseous or liquid UF_6 above atmospheric pressure. The UF_6 detection system contains detectors which use an ionization chamber in which air is made conductive by the use of an alpha emitter. The safety function of this system is to trip the pump, limiting the quantity of UF_6 released. The UF_6 detection system typically contains four detector heads for each pump. The UF_6 Release Detection System for the C-310 side withdrawal Normetex pump includes three heads inside the housing and three heads outside, which provides for three different combinations (two out of three) of fired heads at either location capable of tripping the pump. Firing of two adjacent detectors causes the pump to trip. Proper actuation of the detector heads is ensured by smoke testing with a known maximum concentration of smoke. The relationship of the test smoke to UF_6 outleakage is also known with regard to particle size and mass concentration. In the event that one or more detector heads and/or the automatic trip/isolation circuitry is inoperable, a smoke watch can be utilized for pumps in Mode 2. In the event of a UF_6 release, the smoke watch would detect the release and notify the ACR to utilize the emergency stop button to trip and isolate the pump. [SAR Sections 3.15.4.8, 4.3.2.2.4, and 4.3.2.2.17]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.4 UF_6 RELEASE DETECTION SYSTEM - HIGH VOLTAGE ("OLD") SYSTEM FOR UF_6 CONDENSERS, ACCUMULATORS, AND PIPING HEATED HOUSINGS

LCO 2.3.4.4: The high voltage ("old") UF_6 release detection heads monitoring the subject equipment shall be operable.

APPLICABILITY: Modes: When the applicable equipment is in mode 2* or 3* (*When UF_6 pressure is above atmospheric pressure.)

ACTIONS:

Condition	Action	Completion Time
A. One or more of the detector heads is inoperable.	A.1 Establish a UF_6 smoke watch in the area affected by PGLD head inoperability (but outside any housings) to watch for "smoke" escaping from any UF_6 containing system. TSR 1.6.2.2(d) is not applicable.	Initiate within 1 hour and maintain continuously.
B. Action item A not satisfactorily accomplished.	B.1 Place the affected portion of the withdrawal process in mode 3.	1 hour

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.4-1	"Test fire" the UF_6 release detection system heads	Twice each shift only if operating in a mode specified in the applicability statement.
SR 2.3.4.4-2	Functional test by actuating the detector head with "smoke."	Quarterly

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.4 UF_6 RELEASE DETECTION SYSTEM - HIGH VOLTAGE ("OLD") SYSTEM FOR UF_6 CONDENSERS, ACCUMULATORS, AND PIPING HEATED HOUSINGS (continued)

BASIS:

UF_6 detection is provided above the UF_6 condensers, accumulators, and heated housings. These detectors are on a high-voltage system and when activated sound alarms in the local control room.
(The building alarm will sound for C-315.) Proper actuation of the detector heads is ensured by smoke testing with a known maximum concentration of smoke. The relationship of the test smoke to UF_6 outleakage is also known with regard to particle size and mass concentration.

In the event of a failure of the UF_6 release detection system, the stationing of an operator at the affected equipment would assure monitoring of the system to determine if any outleakage of UF_6 should occur and would provide surveillance capability until the system can be repaired. The real safety hazard is when UF_6 is released into the area inhabited by plant personnel. UF_6 released inside the heated housing is not of significant safety concern unless it leaks from the (non-air tight) housing. Thus, a smoke watch posted outside the housing, watching for "smoke" escaping the heated housing into the occupied spaces, is capable of providing an adequate level of safety. [SAR Section 3.15.7.3]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.5 UF_6 RELEASE DETECTION SYSTEM - HIGH SPEED CENTRIFUGAL PUMPS (C-315 ONLY)

LCO 2.3.4.5: The low voltage ("New") UF_6 release detection system monitoring the C-315 high-speed centrifugal pumps shall be operable.

APPLICABILITY: Modes: 2

ACTIONS:

Condition	Action	Completion Time
A. The low voltage detector head is inoperable.	A.1 Test fire the high voltage detector at the high-speed pump with the manual push-button. TSR 1.6.2.2(d) is not applicable.	Immediately and twice per shift thereafter
B. Action item A satisfactorily accomplished.	B.1 Restore operability to the low voltage detector head. TSR 1.6.2.2(d) is not applicable.	72 hours
C. Action item A not satisfactorily accomplished.	C.1. Perform continuous UF_6 smoke watch on area affected by PGLD detection head inoperability. TSR 1.6.2.2(d) is not applicable.	Initiate within 1 hour and maintain continuously.

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.5-1	Functional test by actuating the detector head with "smoke."	Quarterly

DELETE Concurrent With Facility Release

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.5 UF_6 RELEASE DETECTION SYSTEM - HIGH SPEED CENTRIFUGAL PUMPS (C-315 ONLY) (continued)

BASIS:

An administrative control is in place to prevent operation of the C-315 high-speed centrifugal compressors until further analysis has been performed to identify appropriate preventive and/or mitigative controls [SAR Section 4.3.2.2.1]. Because of this administrative control, the UF_6 Release Detection System - High Speed Centrifugal Pumps (C-315 Only) used with the C-315 high-speed centrifugal compressors no longer meets the TSR selection criteria specified in Section 4.2.3. However, the existing analysis for the UF_6/hot metal reaction event credits this system for mitigating on-site personnel exposure [SAR Section 4.3.2.2.1] Therefore, the TSR for this system will be retained until the further analyses are completed.

The reaction of UF_6 and water (free atmospheric humidity) in the case of a UF_6 release produces uranyl fluoride (UO_2F_2) as particulates and hydrogen fluoride (HF) as a gas. The UO_2F_2 and $HF*x(H_2O)$ are highly visible as "smoke." The UF_6 release detection system is provided on systems which contain gaseous or liquid UF_6 above atmospheric pressure. The UF_6 detection system contains detectors which use an ionization chamber in which air is made conductive by the use of an alpha emitter. Proper actuation of the detector heads is ensured by smoke testing with a known maximum concentration of smoke. The relationship of the test smoke to UF_6 outleakage is also known with regard to particle size and mass concentration. [SAR Section 3.15.7.3]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.6 FACILITY ASSAY LIMITS

LCO 2.3.4.6: Product Withdrawal facility and equipment contained therein shall not be operated at assays greater than 5.5 wt % ^{235}U. Tails Withdrawal facility and equipment contained therein shall not be operated at assays greater than or equal to 1.0 wt % ^{235}U.

APPLICABILITY: Modes: At all times

ACTIONS:

Condition	Required Action	Completion Time
A. Assay exceeds analyzed safe limit.	A.1 Initiate actions to reduce assay.	Immediately

SURVEILLANCE REQUIREMENTS: None.

BASIS:

Product Withdrawal Facility has been analyzed for criticality concerns. The C-310/310-A facility, including the UF_6 accumulators, condensers, traps, scale pits, and product cylinders, is approved for operation up to 5.5 wt % ^{235}U. Tails Withdrawal Facility has not been analyzed for criticality concerns. Therefore, the maximum assay in the facility must be limited to less than 1.0 wt % ^{235}U below which nuclear criticality concerns are negligible. [SAR Section 5.2, Appendix A]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.7 CRITICALITY ACCIDENT ALARM SYSTEM

LCO 2.3.4.7a: Criticality accident detection shall be operable.

APPLICABILITY: In areas, equipment, or processes which contain greater than 700 grams of ^{235}U at an enrichment greater than or equal to 1.0 wt % ^{235}U.

ACTIONS:

Condition	Required Action	Completion Time
A. Areas, equipment, or processes not covered by criticality accident detection.	A.1 Implement the following for areas, equipment, or processes applicable to this LCO and that are not otherwise covered by criticality accident detection .	Immediately
	A.1.1 Discontinue movement of cylinders containing UF_6 enriched to ≥1.0 wt % ^{235}U. AND	
	A.1.2 NaF traps containing uranium enriched to ≥1.0 wt % ^{235}U shall not be handled. AND	
	A.1.3 Waste containing uranium enriched to ≥1.0 wt % ^{235}U shall not be moved. AND	
	A.1.4 Discontinue maintenance activities that require breach of containment of equipment containing uranium enriched to ≥ 1 wt % ^{235}U. AND	
	A.1.5 Cylinder Filling with UF_6 enriched to ≥ 1 wt % ^{235}U will be discontinued. [In-progress cylinder filling cycle(s) may be completed, stopped, and/or re-started as necessary. Normal operation of withdrawal compressors, condensers, and accumulators is not restricted by this action.] AND	
	A.1.6 Perform Required Actions A.1.1, A.1.2, A.1.3, A.1.4, A.2.1, A.2.2, A.3, B.1.1, B.1.2 of TSR 2.4.4.2a.	Immediately
	AND A.2.1 Evacuate area within the area not covered by criticality accident detection. AND	Immediately
	A.2.2 Restrict access to area evacuated in A.2.1. AND	
	A.3 Provide personnel allowed into the area that would be restricted under Action A.2.1 with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate.	
B. Areas, equipment, or processes not covered by criticality accident detection.	B.1.1 Restore criticality accident detection by installing portable CAAS unit providing required criticality accident detection and same alarms as fixed unit. OR	48 hours (effective when NRC assumes regulatory authority)
	B.1.2 Restore criticality accident detection to operable status. TSR 1.6.2.2d is not applicable.	

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.7 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance	Frequency
SR 2.3.4.7a-1 Calibrate CAAS system equipment.	Annually

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the product withdrawal facility are associated with the movement of fissionable materials. The action items maintain the facility in steady state operations to limit the potential for these concerns to the extent possible. Providing another means of coverage (i.e., portable detector/alarm, personal alarm device), restricting operations, or restricting access to the area in the event of the loss of detection will establish protection. [SAR Sections 3.15.7.1, and 4.3.2.6]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.7 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

LCO 2.3.4.7b: Criticality accident alarm shall be operable (audible).

APPLICABILITY: In areas where the maximum foreseeable absorbed dose in free air exceeds 12 rad, except areas in permit-required confined spaces and localized areas of inaudibility.

ACTIONS:

Condition	Required Action	Completion Time
A. Area does not have an audible criticality accident alarm.	A.1 Implement the following for areas, equipment, or processes where a criticality accident could result in a maximum foreseeable dose exceeding 12 rad in the area of inaudibility and LCO 2.3.4.7a applies. A.1.1 Discontinue movement of cylinders containing UF_6 enriched to ≥1 wt % ^{235}U. AND A.1.2 NaF traps containing uranium enriched to ≥1 wt % ^{235}U shall not be handled. AND A.1.3 Waste containing uranium enriched to ≥1 wt % ^{235}U shall not be transported. AND A.1.4 Discontinue maintenance activities that require breach of containment of equipment containing uranium enriched to ≥ 1 wt % ^{235}U. AND A.1.5 Cylinder Filling with UF_6 enriched to ≥ 1 wt % ^{235}U will be discontinued. [In-progress cylinder filling cycle(s) may be completed, stopped, and/or re-started as necessary. Normal operation of withdrawal compressors, condensers, and accumulators is not restricted by this action.] AND A.1.6 Perform Required Actions A.1.1, A.1.2, A.1.3, A.1.4, A.2.1, A.2.2, A.3, B.1 of TSR 2.4.4.2b. AND A.2.1 Evacuate area of inaudibility AND A.2.2 Restrict access to the area of inaudibility. AND A.3 Provide personnel allowed to enter the area of inaudibility with an alternate means of criticality alarm notification such as a device that will alarm on sensing a 10mr/hr dose rate, or a radio in constant communication with the Central Control Facility.	Immediately Immediately Immediately
B. Area does not have an audible criticality accident alarm.	B.1 Restore criticality accident alarm to operable status. TSR 1.6.2.2d is not applicable.	48 hours (effective when NRC assumes regulatory authority)

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.7 CRITICALITY ACCIDENT ALARM SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.7b-1	Test the CAAS and building horns.	Annually
SR 2.3.4.7b-2	Verify that the CAAS air accumulator supply pressure to the building horns is at least 129 psig.	Quarterly

BASIS:

The CAAS is used to warn plant personnel of a criticality or radiation accident. This system is designed to detect radiation and provide a distinctive, audible signal which will alert personnel to move from those work areas which are potentially affected. Audibility is not provided for areas in permit-required confined spaces and localized areas of inaudibility resulting from temporary activities that generate high noise levels. A "buddy system" is used to ensure personnel working in these areas are notified of alarms in order to evacuate. One person remains outside the area and maintains contact with personnel in the area. Evacuation of the area of inaudibility and restricting access to those areas will eliminate the potential for increased consequences due to personnel not hearing an alarm. The design of the system, three detector modules per cluster, provides protection for criticality events even with partial losses of required equipment. The CAAS also provides detection coverage in most areas by using an overlapping pattern of individual cluster units. Criticality concerns with the product withdrawal facility are associated with the movement of fissionable materials. The action items maintain the facility in steady state operations to limit the potential for these concerns to the extent possible. The alarm signal is provided by sounding building horns which sound upon a signal from any cluster. Providing another means of coverage (i.e., portable detector/alarm, personal alarm device, etc.), restricting operations, or restricting access to the area in the event of the loss of alarms will establish protection. [SAR Sections 3.15.7.1 and 4.3.2.6, 5.2.2.5]

The CAAS air accumulators provide for 120 seconds of horn actuation when at their minimum acceptable pressure of 129 psig. Electronic horns are installed in some areas. These horns have battery backup power supplies which will provide for at least 120 seconds of horn actuation even if off-site power is lost.

The annual surveillance of the CAAS building horns consists of placing the cluster in the test mode with a keyswitch, and manually causing two detector modules to generate radiation readings above the alarm setpoint. The cluster electronics determines that this meets the high radiation alarm criteria and propagates a high radiation alarm signal to the rest of the system. This signal activates the high radiation alarm light and bell in C-300 and activates the building CAAS horns. Each horn is qualitatively verified to be operating. This test is a horn functional test and each module combination is tested to generate the high radiation signal.

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.8 FIRE PROTECTION SYSTEM - BUILDING SPRINKLER SYSTEM

LCO 2.3.4.8 The automatic fire suppression (sprinkler) systems in process buildings C-310 and C-315 (exclusions: the dry pipe sprinkler system in C-310 and the deluge system for the exterior transformer located adjacent to C-315) shall be operable.

APPLICABILITY: Modes: At all times, except when the facility withdrawal operations are shutdown and the lube oil is isolated or removed from the lube oil system for equipment covered by a specific sprinkler system.

ACTIONS:

Condition	Required Action	Completion Time
A. An automatic fire suppression system or a portion of an automatic fire suppression system is inoperable.	A.1 Restore the automatic fire suppression system to operable status.	2 hours
B. Action Item A not satisfactorily accomplished.	B.1 Conduct a fire patrol for the affected area(s) of the affected building(s). AND B.2 Confirm at least one HPFW hydrant adjacent to the affected building(s) is operable. TSR 1.6.2.2(d) is not applicable.	2 hours and every hour thereafter. 4 hours

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.8 FIRE PROTECTION SYSTEM - BUILDING SPRINKLER SYSTEM (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.8-1	Verify control valves in the required flow paths are open.	Monthly
SR 2.3.4.8-2	Functionally test each automatic fire suppression system.	Annually
SR 2.3.4.8-3	Cycle all control valves in the required flow paths.	Annually
SR 2.3.4.8-4	Flow test at least one HPFWS fire hydrant adjacent to each process building (distribution system test).	Annually

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.8 FIRE PROTECTION SYSTEM - BUILDING SPRINKLER SYSTEM (continued)

BASIS:

As discussed in the SAR accident analysis (Sections 4.3.2.1.9 and 4.3.2.2.16), an unmitigated lube oil fire in process buildings C-310 and C-315 could cause failure of the structural steel followed by localized collapse of the structure. This collapse could damage process piping allowing a release of UF_6. A large fire could also cause a primary system failure due to over temperature. The automatic fire suppression (sprinkler) systems in these buildings will minimize the potential for and mitigate the effects of a large fire.

The portions of the high pressure fire water system (HPFWS) required to mitigate a lube oil fire in buildings C-310 and C-315 include the automatic wet-pipe sprinkler systems in the two buildings; the HPFWS distribution mains, water storage tank and pumps; and the C-631-2 cooling tower basin. The dry pipe sprinkler system in C-310 (canopy area for product withdrawal) and the deluge system located adjacent to C-315 (exterior transformer) are part of the sanitary and fire water system and are not subject to the LCO. They are excluded since a fire within the areas protected by these systems would have no impact upon process piping containing UF_6.

The sprinkler systems provide primary fire suppression capability for the areas in which they are installed. If an automatic fire suppression system is not functional or has a closed valve, hourly fire patrols will provide backup fire protection capability. Backup fire suppression will be provided by hose streams supplied from fire hydrants located adjacent to the affected building.

As discussed above, the unmitigated lube oil fire in C-310 and C-315 facilities could result in large fire which could cause loss of the primary system integrity and release of UF_6 In addition, the large fire could threaten the structural integrity of the building and cause localized building collapse that could itself result in loss of primary system integrity and release of UF_6, When facility withdrawal operations are shutdown and the lube oil supply is isolated or removed from the lube oil system for equipment covered by the specific sprinkler system, then the fuel supply is isolated or eliminated and the initiator is eliminated and the potential for a large fire is significantly reduced. In addition, with withdrawal operations shutdown, the quantity of UF_6 in the withdrawal equipment/piping is significantly reduced. The building sprinkler system is not required during this shutdown condition. The fire protection program as required by TSR 3.12 and established, implemented and maintained as described in SAR Section 5.4 provides ample protective elements for preventing a large fire. The fire protection program ensures that fire hazards (combustible loading/storage, etc.) are controlled sufficiently to prevent large fires. The process buildings are subject to an annual building survey as required by SAR Section 5.4.

Lube oil is considered isolated when it has been drained from the lube oil system piping and gravity supply tank. The lube oil is contained in the ground floor drain tank with isolation valves shut. Insignificant quantities of oil may remain in the piping and gravity supply tank. Lube oil is considered removed when the lube oil has been drained from the lube oil system piping and gravity supply tank and the ground floor drain tank has been pumped out/drained. Insignificant quantities of oil may remain in the piping and tanks. During these conditions the risk of a large fire is significantly reduced.

Surveillance Requirement 2.3.4.8-2, functional testing of each automatic fire suppression system, includes an inspector test valve (ITV) flow test and a main drain flow test. The ITV test simulates the actuation of a single sprinkler head. The main drain flow test verifies that upstream control valves are open and there are no line blockages in the system's water supply piping. The ITV and main drain flow tests are used during the surveillances to verify that the sprinkler system has adequate water flow.

Positions of indicating control valves and seals on non-indicating control valves will be visually verified monthly. Non-indicating valves with missing or broken seals will be cycled and new seals installed. All control valves will be cycled annually. [SAR Sections 3.15.7.2, 4.3.2.1.9 and 4.3.2.2.16]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.9 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER DISTRIBUTION MAINS

LCO 2.3.4.9: The High Pressure Fire Water System (HPFWS) distribution mains (excluding mains not in the direct flow path to a required sprinkler system) shall be operable.

APPLICABILITY: Modes: Whenever any one of the building sprinkler systems is required to be operable per TSR 2.3.4.8.

ACTIONS:

Condition	Required Action	Completion Time
A. A sectional valve in the distribution mains is not in the open position.	A.1 Restore to the open position.	4 hours
B. Action item A not satisfactorily accomplished.	B.1 Confirm water supply is available on both sides of the closed valve.	4 hours
C. Action item B not satisfactorily accomplished.	C.1 Conduct a fire patrol for the affected area(s) of the affected building(s). AND C.2 Provide a temporary water supply for the affected sprinkler systems. TSR 1.6.2.2(d) is not applicable.	2 hours and every hour thereafter. 8 hours

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.9 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER DISTRIBUTION MAINS (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.9-1	Verify sectional valves in the flow paths are open.	Monthly
SR 2.3.4.9-2	Cycle all sectional valves in direct flow path.	Annually
SR 2.3.4.9-3	Flow test at least 1 HPFWS fire hydrant adjacent to each process building (distribution system test).	Annually

BASIS:

All required sprinkler systems have at least two supply paths from the HPFWS pumps through the distribution mains. Hence, the closure of one of the sectional valves in Condition A of this TSR will not cause a loss of function of any required sprinkler system. If two or more sectional valves are closed, the ability to supply water to the required sprinkler systems can be lost. This would be identified by Action B. A temporary water supply will be provided consisting of hoses connected between one or more fire hydrants and the fire department connection(s) on the affected sprinkler system(s). The hoses are to be in place and connected to satisfy Condition C. The hoses will only be pressurized with HPFWS water in the event of a fire.

Positions of indicating sectional valves and seals on non-indicating sectional valves will be visually verified monthly. Non-indicating valves with missing or broken seals will be cycled and new seals installed. All sectional valves will be cycled annually. [SAR Sections 3.15.7.2, 4.3.2.1.9 and 4.3.2.2.16]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.10 FIRE PROTECTION SYSTEM - WATER SUPPLY BASIN

LCO 2.3.4.10: The C-631-2 basin shall be operable (water level within 5 feet of basin top when HPFWS pumps 5 or 6 are not operable, and water level within 15 feet of basin top when HPFWS pumps 5 and 6 are both operable).

APPLICABILITY: Modes: Whenever any one of the building sprinkler systems is required to be operable per TSR 2.3.4.8.

ACTIONS:

Condition	Required Action	Completion Time
A. Basin water level drops below 5 feet from the basin top.	A.1 Confirm HPFWS pumps 5 and 6 are operable.	Immediately
B. Action Item A not satisfactorily accomplished.	B.1.1 Initiate RCW emergency makeup from the C-611 plant water system AND B.1.2 Restore level to within 5 feet from the basin top. OR B.2.1 Open the RCW crossover valves to provide makeup water from C-633 AND B.2.2 Restore level within 5 feet from the basin top.	Immediately 4 hours Immediately 4 hours
C. Basin water level drops below 15 feet from the basin top.	C.1.1 Initiate RCW emergency makeup from the C-611 plant water system AND C.1.2 Restore level to within 5 feet from the basin top. OR C.2.1 Open the RCW crossover valves to provide makeup water from C-633 AND C.2.2 Restore level within 5 feet from the basin top.	Immediately 4 hours Immediately 4 hours

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.10 FIRE PROTECTION SYSTEM - WATER SUPPLY BASIN (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.10-1	Verify water level in the C-631-2 RCW cooling tower basin is within 5 feet of the top of the basin.	Monthly

BASIS:

The C-631-2 RCW cooling tower basin and the wetwell under the C-631 building are connected by a flume. Their combined volume provides the source of water to all the HPFWS pumps. They will hold over 4 million gallons of water when the level is within 5 feet of the top of the basin. At this level, the usable volume of water available to HPFWS pumps 2 and 3, which take a suction through the side of the basin, will exceed the 825,000 gallons needed to satisfy maximum system demands of 6,875 gpm for a two hour duration. [Note: This requirement is conservative with respect to the system evaluation presented in SAR Section 3.15.7.2.] HPFWS pumps 5 and 6 take a suction from the C-631-1 wetwell. Their suction intakes are at a lower elevation than those of the other two pumps and can draw on more than 3.5 million gallons of water. If the basin level drops to 15 feet from the top of the basin, the suctions of HPFWS pumps 2 and 3 will be uncovered. However, HPFWS pumps 5 and 6 will still have an adequate water volume to meet the maximum system demands for two hours.

Normal makeup flow to the basin is from the plant water system. If the water drops below the required level and can not be restored by normal makeup, emergency makeup will be initiated to dedicate all plant water system output to the basin. If needed, crossover valves can also be opened to supply up to 9,000 gpm from the C-633 basin.

Basin water level is verified by visual observation of a graduated measuring device. [SAR Sections 3.15.7.2, 4.3.2.1.9 and 4.3.2.2.16]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.11 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER PUMPS

LCO 2.3.4.11: At least two High Pressure Fire Water System (HPFWS) pumps shall be operable.

APPLICABILITY: Modes: Whenever any one of the building sprinkler systems is required to be operable per TSR 2.3.4.8.

ACTIONS:

Condition	Required Action	Completion Time
A. One HPFWS pump operable.	A.1 Confirm the HPFWS storage tank is at least 90% full. AND A.2 Provide temporary water source(s) and pump(s) to restore total flow capability to at least 6,875 gpm.	Immediately 8 hours
B. No HPFWS pumps operable OR Action Item A not satisfactorily accomplished.	B.1 Alert offsite fire departments. AND B.2 Provide temporary water source(s) and pump(s) to restore total flow capability to at least 6,875 gpm.	Immediately 72 hours

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.11 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER PUMPS (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.11-1	Manually start fire water pumps.	Monthly
SR 2.3.4.11-2	Automatic start of fire water pumps on simulated loss of fire system pressure.	Annually
SR 2.3.4.11-3	Calibrate the switches that provide the automatic start signals to the HPFWS pumps.	Annually
SR 2.3.4.11-4	Verify HPFWS pumps 2, 3, 5, and 6 will flow at least 90% of their rated capacity at their rated pressure.	Annually

BASIS:

The HPFWS pumps must be capable of satisfying the maximum sprinkler system and hose stream demands of 4,875 gpm and 2,000 gpm respectively. This results in a combined pumping capacity requirement of 6,875 gpm. [Note: This requirement is conservative with respect to the system evaluation presented in SAR Section 3.15.7.2.]

Pumps 2, 3, 5, and 6 are rated at 125 psi TDH and have rated capacities of 4,625 gpm, 4,625 gpm, 4,500 gpm, and 4,500 gpm respectively. To allow for degradation of the pumps over time, only 90% of the rated pump flow is relied upon to satisfy system flow demands. The two pumps with the smallest flow capacities can supply a combined flow of 8,100 gpm under degraded conditions.

When the HPFWS storage tank is 90% full, it is capable of supplying 2,250 gpm for two hours. This flow combined with the flow from one degraded HPFWS pump would fall short of satisfying maximum system demand by no more than 575 gpm. The short fall can be addressed by the use of a fire pumper truck taking a suction from a cooling tower basin and discharging through a fire hydrant to the system distribution mains. If such a temporary water supply is needed to satisfy

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.11 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER PUMPS (continued)

BASIS (continued):

Condition A, the pumper and required hoses/pipes will be pre-positioned. The hoses/pipes will not be filled with water except in the event of a fire.

When only one HPFWS pump is operable, the C-300 operators will manually start the pump upon notification of a fire. This is necessary since the automatic start of the pump would not occur until after the HPFWS storage tank level drops below 40% full.

If no HPFWS pumps are operable or Condition A cannot be satisfied, the off site fire departments will be alerted so they will be ready to provide assistance if needed. Also, temporary sources of pumping capacity will be sought to restore design capacity within 72 hours.

HPFWS pump 1 is a jockey pump and has a rated capacity of only 200 gpm. It cannot be used to satisfy the TSR Condition Requirements since it will be dead headed when the larger HPFWS pumps are operating. HPFWS pump 4 is not operable and has been abandoned in place.

Level in the HPFWS storage tank is normally maintained by HPFWS pump 1. If water demand on the system exceeds the capacity of this pump, tank level and system pressure will drop. Switches in each of the fire pump controllers will automatically start the fire pumps sequentially until the system demand is satisfied. [SAR Sections 3.15.7.2, 4.3.2.1.9 and 4.3.2.2.16]

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.12 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER STORAGE TANK

LCO 2.3.4.12: The HPFWS storage tank shall be operable (at least 90% full and valved to the distribution mains).

APPLICABILITY: Whenever any one of the building sprinkler systems is required to be operable per TSR 2.3.4.8.

ACTIONS:

Condition	Required Action	Completion Time
A. The HPFWS storage tank is not operable.	A.1 Restore the tank to operable status.	2 hours
B. Action item A not satisfactorily accomplished.	B.1 Confirm at least two HPFWS fire pumps are operable. AND B.2 Perform one of the following: B.2.1 **IF** level is less than 90% full due to significant leakage from the tank, isolate the tank and maintain system pressure by continuously operating a HPFWS pump. OR B.2.2 **IF** level is less than 90% full due to water demands from non-fire conditions at locations other than the tank, isolate the water demands and restore level to at least 90% full. OR B.2.3 **IF** the tank is isolated for maintenance or inspection, maintain system pressure by continuously operating a HPFWS pump.	Immediately 4 hours

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.3.4.12 FIRE PROTECTION SYSTEM - HIGH PRESSURE FIRE WATER STORAGE TANK (continued)

SURVEILLANCE REQUIREMENTS:

Surveillance		Frequency
SR 2.3.4.12-1	Verify that the HPFWS storage tank contains at least 270,000 gallons of water (filled to at least 90% capacity).	Monthly
SR 2.3.4.12-2	Visual inspection of exterior of HPFWS storage tank.	Annually

BASIS:

For the 300,000 gallon elevated storage tank to be considered operable, its level must be at least 90% full (by volume) and it must be aligned to the HPFWS distribution mains. When operable, it is capable of supplying maximum sprinkler system and hose stream demands of 6,875 gpm [Note: This requirement is conservative with respect to the system evaluation presented in SAR Section 3.15.7.2.] for approximately 39 minutes. It is also capable of supplying 2,250 gpm for a duration of two hours which is slightly greater than 32% of the water required for maximum fire protection demands.

If the tank is not operable, the TSR required actions are intended to address two issues. The first is to verify there are sufficient fire pumps available to supply required firewater demands without having the tank operable. The second is to maintain the HPFWS filled with water and pressurized above automatic start pressures for the fire pumps.

During non-fire conditions, the tank floats on the HPFWS and maintains the required system pressure. Level in the tank is normally controlled by the 200 gpm HPFWS pump 1 (a jockey pump) which is designed to provide routine makeup for water leakage from the system. The jockey pump is controlled by level switches located in the tank. If the jockey pump is inoperable, this level control function can also be performed by manual operation of a fire pump.

During a fire, water demand on the system would exceed the capacity of the jockey pump. The tank level and system pressure will then drop. Pressure switches in the individual fire pump controllers will automatically start the fire pumps sequentially until available flow exceeds the system demand. At this point the tank will start to refill and function as a surge volume as water demand fluctuates during fire fighting efforts. After the fire is extinguished, tank level will be promptly restored above the 90% level.

SECTION 2.3 SPECIFIC TSRs FOR PRODUCT AND TAILS WITHDRAWAL FACILITIES

2.3.4 GENERAL LIMITING CONDITIONS FOR OPERATION

BASIS (continued)

If level in the tank falls below 90% during non-fire conditions, either the jockey pump is not functioning properly or there is a water demand on the system that exceeds the capacity of the pump. In either case, one or more of the HPFWS fire pumps will be started automatically or manually and an attempt made to restore tank level above 90%. The cause of the excessive water demand will be investigated. If the demand is due to significant leakage from the storage tank, the tank will be isolated. In this case, pressure on the balance of the HPFWS will be maintained above the fire pump automatic start pressures by continuously operating either the jockey pump or one of the fire pumps. If the excessive demand is from locations in the HPFWS other than the tank, the demand will be isolated. Such demands could be from non-fire conditions such as line breaks, spurious actuation of a sprinkler system, or flow testing and flushing of fire hydrants. Once the demand is isolated, pressure will be restored on the balance of the system by refilling the storage tank and maintaining its level above 90%.

If the tank is isolated for maintenance or inspection, pressure in the HPFWS will be maintained above the fire pump automatic start pressures by continuously operating either the jockey pump or one of the fire pumps. [SAR Sections 3.15.7.2, 4.3.2.1.9 and 4.3.2.2.16]