



November 9, 2012
GDP 12-0033

ATTN: Document Control Desk
Ms. Catherine Haney
Director, Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

**Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001, Certificate No. GDP-1
Certificate Amendment Request (CAR) –Table 3.2.2-1, Minimum Staffing Requirements**

Dear Ms. Haney:

In accordance with 10 CFR 76.45, the United States Enrichment Corporation (USEC) hereby submits a request for amendment to the Certificate of Compliance for PGDP. This Certificate Amendment Request (CAR) proposes to revise TSR Section 3.0, Administrative Requirements, Table 3.2.2-1, Minimum Staffing Requirements.

Enclosure 1 contains the Oath and Affirmation Statement. Enclosure 2 provides a detailed description and justification for the proposed change. Enclosure 3 is a copy of the revised TSR and Safety Analysis Report (SAR) pages associated with this request. The TSR pages are provided for your review and approval. The single SAR page change has been evaluated in accordance with 10 CFR 76.68. Based on the results of the 10 CFR 76.68 evaluation, the enclosed SAR change does not require prior NRC review and approval and is provided for information only. Enclosure 4 contains the basis for USEC's determination that the proposed changes associated with this CAR are not significant.

The proposed changes will revise the feed facilities minimum staffing requirements, cascade facilities minimum staffing requirements, and minimum staffing requirements for the power and utility operations. The minimum staffing requirements for the feed facility modes 1, 2, 5 and 7 will be revised to only require one operator instead of the current two. The minimum staffing requirements for the feed facility modes 3, 4, and 8 will remain unchanged. The change to the cascade minimum staffing requirements table will allow additional flexibility in staffing for the cascade enrichment facilities during specific modes/operations. With the enrichment cascade shutdown, very limited operations would be required or needed. During the limited operations, the required operator actions are significantly curtailed, thereby significantly reducing the staffing requirements. The minimum staffing requirements for Power Operations and Utility Operations is proposed to be reduced to zero. A review of the responsibilities for these positions determined that they do not perform any safety related activities as credited in the accident analysis or associated TSR required actions. Thus, the proposed changes will not result in any adverse impact on the health, safety or security of workers or the public.

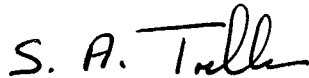
USEC requests NRC review of this CAR as soon as practical. The amendment should become effective 30 days after issuance.

NMSSDI

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Should you have any questions related to this submittal, please contact me at (301) 564-3250. There are no new commitments contained in this submittal.

Sincerely,



Steven A. Toelle
Director, Regulatory Affairs

Enclosures:

1. Oath and Affirmation
2. Detailed Description and Justification of the Changes
3. Removal/Insertion Instructions
4. Significance Determination

cc: J. Calle, NRC Region II Office
NRC Sr. Resident Inspector – PGDP
O. Siurano-Perez, NRC Project Manager - HQ

Enclosure 1
GDP 12-0033

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-nnnn, 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 9th day of November, 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

Rita L. Peak
Notary Public
State of Maryland
County of Montgomery
Expiration 12/10/2013

Enclosure 2
GDP 12-0033

USEC-01
Certificate Amendment Request
Revise Table 3.2.2-1, Minimum Staffing Requirements

Detailed Description and Justification of the Changes

Enclosure 2
GDP 12-0033
United States Enrichment Corporation (USEC)
Certificate Amendment Request
Revise Table 3.2.2-1, Minimum Staffing Requirements
Detailed Description and Justification of the Changes

1) Description of Change

Currently, feed facility modes 1, 2, 5, and 7 require two operators to be in the facility or immediately surrounding grounds. Modes 1, 2, 5, and 7 will have their minimum staffing level changed from two operators to one operator. Minimum staffing levels for the other feed facility modes will not change.

The minimum staffing requirements for Power Operations and Utility Operations is proposed to be reduced to zero. A review of the responsibilities for these positions determined that they do not perform any safety related activities as credited in the accident analysis or associated TSR required actions.

The proposed changes to TSR Table 3.2.2-1, Minimum Staffing Requirements, for the cascade enrichment facilities, C-331, C-333, C-335 and C-337, will first remove minimum staffing requirements when the cascade facility is shutdown with no enrichment operations and all cells are in the Cascade 3 mode (Not In Use; System at UF₆ negative) and all freezer/sublimers (F/S) are in the F/S 6 mode (Out of Service; R-114 drained from vessel). The second change to the staffing requirement will relax minimum staffing in the C-331, C-333, C-335, and C-337 facilities to one operator when the cascade facility is shutdown with no enrichment operations and no cell motors are running. This reduced staffing requirement would be limited during Cascade 1 (Below Atmospheric Pressure) with the facility not enriching UF₆ (no cell motors running) and only operations involved with 1) maintaining a fluorinating environment or dry gas blanket or 2) operating a P&E pump. The third proposed change will add an exception to the Cascade 1 mode during limited operations involving equipment, headers and surge drums containing UF₆ if: 1) UF₆ in piping/equipment is below atmospheric pressure, 2) all cascade enrichment cells including booster stations are in Cascade 3, and 3) P&E pumps are not energized. The fourth proposed change will revise TSR Table 3.2.2-1 Footnote a. to make it clear that the cascade ACRs are manned as required by operating mode.

The changes shown below are for TSR Table 3.2.2-1, Minimum Staffing Levels. New wording is shown as underlined and deleted wording is shown as a strikeout. Footnotes "g." and "h." were added by certificate amendment request submitted with GDP 12-0005 and is currently being reviewed for approval. The final revised SAR and TSR pages are shown in Enclosure 3. The changes on Enclosure 3 pages are noted with revision bars in the right hand margin.

TSR Table 3.2.2-1, Minimum Staffing Requirements

Facility Function	Mode/Operation	Staffing Requirements ^h	Work Area Definition
C-300 ^a	All	3 ₂	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-333-A ^b	1, 2, 5, 7	2 ₁	One Two persons in the operating facility or immediately surrounding the 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-331 / C-335	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2 ^f	At least one person in the ACR.
	<u>Cascade 1^e</u>	<u>1</u>	<u>One person in the building.</u>
C-333 / C-337	Cascade 1, 2, 3 F/S 1, 2, 3, 4, 5	2 ^f	At least one person in the ACR.
	<u>Cascade 1^e</u>	<u>1</u>	<u>One person in the building.</u>
Power Operations^g	At all times	4	Onsite
Utilities Operations ^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 when required by operating mode. 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 requirements 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 UF₆ 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 UF₆ (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 and associated valves, headers and surge drums.

f. Staffing requirements is zero for limited operations involving equipment, headers and surge drums containing UF₆ if: 1) UF₆ 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, the facility minimum staffing requirements and associated note(s) will be lined through but not removed from the table.

2) Reason for the Changes

The proposed changes include reducing the minimum staffing requirements for 1) the feed facilities, 2) the cascade facilities, and 3) the power and utilities operations. Each proposed change will be discussed below.

The proposed changes to the feed facilities will reduce the minimum number of operators required at the feed facilities during modes 1, 2, 5, and 7. This reduced staffing will still allow safe efficient operation of the feed facilities during these modes. USEC conducted a review of the feed facilities (C-333-A and C-337-A) minimum staffing requirements specified in Technical Safety Requirements (TSR) Section 3.2.2, Facility Staff, and Table 3.2.2-1, Minimum Staffing Requirements, which identified that the minimum number of staff specified for specific feed facility modes can be reduced without adversely affecting safe operation of the facility. Modes 1, 2, 5, and 7 currently require a minimum staffing level of two. The proposed minimum staffing will be reduced to one for modes 1, 2, 5, and 7. The minimum staffing requirements for the remaining modes are unchanged. The proposed minimum staffing requirements are consistent with the number of operations staff required to safely operate the facility during normal and upset/accident conditions.

Currently, the TSR minimum staffing requirements for the enrichment cascade facilities requires either two or three operators during all modes/operations as specified in TSR Table 3.2.2-1, Minimum Staffing Requirements. The proposed changes to the cascade facilities TSR minimum staffing requirements in Table 3.2.2-1 will be for the specific operating modes/conditions delineated below. These changes will provide staffing flexibility for the cascade enrichment facilities.

- The first proposed change to the cascade facility minimum staffing requirements will allow staffing flexibility for operating modes/conditions in the cascade enrichment facilities when all enrichment operations have been shut down and all the cascade cells are in the Cascade 3 mode (Not In Use; System at UF₆ negative) and all the F/Ss are in the FS 6 mode (Out of Service; R-114 Drained from system). The minimum staffing for these modes and operations is proposed to be zero.
- The second proposed change to the cascade facility minimum staffing requirements will also allow staffing flexibility when the facility enrichment cascade is shutdown with no enrichment operations (no stage/booster motors running) and the only operations are 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 and associated valves, headers and surge drums. These operations will be a specific operating mode/condition exemption while in the Cascade 1 mode with minimum staffing requirement of one operator located in the facility.
- The third proposed change to the cascade facility minimum staffing requirement will allow an exception to the Cascade 1 mode during limited UF₆ operations involving equipment, evacuation/feed headers and surge drums containing UF₆ if: 1) UF₆ in piping/equipment is below atmospheric pressure, 2) all cascade enrichment cells including booster stations are in Cascade 3, and 3) P&E pumps are not energized. These limited operations during Cascade 1 mode do not require constant attention thus continuous staffing in the facility is not required (zero manning requirement), as there are no running UF₆ equipment and all equipment/piping are below atmospheric pressure.
- The fourth proposed change to the cascade facility minimum staffing requirement will revise TSR Table 3.2.2-1 footnote a. to make it clear that the cascade ACRs are manned as required by operating mode. Currently, footnote "a." of TSR Table 3.2.2-1 specifies that the C-331, C-333, C-335, and C-337 ACRs shall always be manned. This requirement could conflict with the proposed changes to the cascade minimum staffing requirements. The proposed change to footnote "a." would require the ACRs be manned when required by specific operating mode. This is currently the manning requirement for the C-310, C-315, C-333-A, and C-337-A ACRs/OMRs. Each of the existing and

proposed minimum staffing requirements for the cascade facilities specify whether the ACR must be manned in the Work Area Definition column.

The minimum staffing requirements for Power Operations and Utility Operations is proposed to be reduced to zero. A review of the responsibilities for these positions determined that they do not perform any safety related activities as credited in the accident analysis or associated TSR required actions.

These changes will allow facility staffing flexibility, which will result in more efficient and continued safe operation of the feed facilities, cascade enrichment facilities, and power/utilities operations.

3) Justification of the Changes

i) Feed Facility Minimum Staffing Changes

SAR Section 6.5, Operations, states that staffing levels for the shifts for operation and support are not fixed, but are based on expected or planned activities for the upcoming period. The staffing levels are based on evaluation of the needs for efficient operation, and take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and TSR specified minimum staffing levels. When special or complicated activities are included in the work plans for an upcoming work period, the staffing levels will be increased as required to perform the planned activities. TSR Section 3.2.2, Facility Staff, and TSR Table 3.2.2-1, Minimum Staffing Requirements, specifies the minimum staffing level for each Facility/Function for specific modes/operations. The minimum staffing is based on the personnel required for the necessary and sufficient operator actions required to meet the expectations and/or assumptions made in the accident analysis.

The changes to the minimum staffing requirements for Feed Facility Modes 1, 2, 5, and 7 from two to one is supported by an evaluation of the applicable TSRs for the mode, accident scenario assumptions for the applicable TSR systems, and necessary and sufficient operator actions required by expectations and/or assumptions made in the accident analysis. The proposed minimum staffing levels are consistent with the minimum number of operations staff required to safely operate the facility during normal and upset conditions.

Not all TSRs have applicability specific to individual modes. These will be discussed in general instead of with each mode. The following TSRs have mode applicability specified as "All" or "At all times". In addition, the TSR associated with CAAS will be discussed below since it does not specify any specific mode applicability.

2.2.2.1 AUTOCLAVE SHELL PRESSURE (Safety Limit)

APPLICABILITY: Modes: All

The autoclaves are designed and fabricated to meet ASME Boiler and Pressure Vessel code standards. ASME code requires that the pressure transient during relief from this type of vessel not exceed 110% of the maximum allowable working pressure (MAWP). The safety limit specified in this TSR safety limit (SL) is based on this value, 110% of MAWP, 200 psig. This safety limit is not based on any accident analysis requirement as none of the postulated scenarios challenge the autoclave pressure boundary.

This is a SL that existed prior to the Safety Analysis Report Upgrade (SARUP) which updated the PGDP Safety Analysis and TSRs. This SL is not credited in the current accident analysis but remains in the TSRs. Regardless; this system requires no operator actions to assure that it performs its intended function. Therefore, this TSR will be considered as not having any impact on minimum staffing requirements during any specific mode.

2.2.2.2 UF₆ CYLINDER TEMPERATURE (Safety Limit)

APPLICABILITY: Modes: All

UF₆ cylinder can only be exposed to the potential of rupture during the heating of the cylinder. During cylinder heating in the autoclave the UF₆ expands in volume. Ullage (void volume) is lost due to heating a cylinder to an excessive temperature based on the amount of UF₆ in the cylinder. A cylinder is assumed to fail at some point above its SL.

This SL is associated with specific TSR Limiting Control Settings (LCS) specified in TSRs 2.2.3.1, Autoclave High Pressure Isolation System, and 2.2.3.3, Autoclave Steam Pressure Control System. The associated individual TSRs have specific Applicability modes and are discussed in more detail below.

2.2.4.9 HEATING UF₆ PLUGS

APPLICABILITY: Modes: At all times.

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 UF₆ release due to pipe rupture.

This is an administrative TSR that existed prior to the Safety Analysis Report Upgrade (SARUP), which updated the PGDP Safety Analysis and TSRs. This TSR is not credited in the current accident analysis, but remains in the TSRs. Regardless; compliance with this administrative TSR is expected of all operators regardless of how many operators are present in feed facilities

Therefore, this TSR will be considered as not having any impact on minimum staffing requirements during any specific mode.

2.2.4.5 CRITICALITY ACCIDENT ALARM SYSTEM

2.2.4.5a: DETECTION COVERAGE

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

2.2.4.5b: AUDIBILITY

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.

The CAAS is used to detect and 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.

If CAAS actuates all personnel are required to immediately evacuate the facility. The personnel are not required to perform any action or task prior to evacuation. Therefore, this TSR does not impact minimum staffing and will not be discussed further.

As delineated above, none of these TSRs will impact the proposed change in minimum staffing for feed facilities operating modes.

The feed facilities operating Modes 1, 2, 5, and 7 have proposed changes for their respective minimum staffing requirements. The remainder of the feed facilities operating modes do not have proposed changes to their minimum staffing requirements and will not be discussed further. The following discussions for each of the feed facilities modes with proposed staffing changes provide the details of the evaluation for minimum staffing requirements:

Mode 1 – Cylinder Handling – This mode includes UF₆ cylinder movements, cylinder insertions to, and removal from autoclave.

There are no Feed Facility TSRs that have applicability specifically listed during Mode 1, except those discussed above that specify “All” or “At all times”. Liquid cylinders are not moved during this facility mode or at any time in the feed facilities (as delineated in SAR administrative controls and flowed into operating procedures). Therefore, this mode can be supported by the proposed minimum staffing requirement of one operator. Note that the proposed minimum staffing for the feed facilities cylinder handling is the same as the currently approved minimum staffing level as required for identical empty/solid cylinder handling in the toll transfer and sampling facility.

Mode 2—This mode is applicable when the autoclave is open and a cylinder is present. The mode is split into two sub-modes; Autoclave Open and Autoclave Out of Service. Each will be discussed individually below.

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, testing, cylinder valve operation or autoclave repair.

The following TSR is specifically applicable to Autoclave Open sub-mode of Mode 2:

2.2.4.8 CYLINDER HANDLING - CYLINDER DISCONNECTION

APPLICABILITY: Mode: 2

Closing the cylinder valve prior to disconnecting the cylinder from the manifold prevents UF₆ 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 UF₆ out-leakage.

This TSR is an administrative control and does not have any response requirements during upset conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in the feed facilities. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 2A.

The accidents of concern that may result in a UF₆ release during this sub-mode of operation are Release Of Solid/Gaseous UF₆ to Atmosphere (4.3.2.2.3), Pigtail/Line Failure Outside Autoclave (4.3.2.2.10), and Cylinder Failure Outside Autoclave (4.3.2.2.15). The accident analysis does not credit any operator actions during these accident scenarios with the Autoclave Open other than to evacuate the area and notify the PSS. Therefore, this mode can be supported by the proposed minimum staffing requirement of one operator.

Autoclave Out-of-Service - Autoclave is considered out-of-service when it is open with a cylinder in the autoclave and no operation is in progress.

Since no operation is in progress by definition of the mode, there are no TSRs or accident scenarios that are specifically applicable to this feed facilities mode. There is the potential following an interrupted heat cycle to have a liquid cylinder in an autoclave in the Autoclave Out-of-Service sub-mode of Mode 2. Following an interrupted heat cycle, CP4-CO-ON3038 specifically requires the cylinder valve to be closed, cylinder valve and pigtail leak rated, pigtail removed, and the autoclave partially closed (provides cylinder valve protection during cool-down). During the subsequent cool-down of the cylinder, the autoclave remains in the Autoclave Out-of-Service mode (mode 2). During this time, with no other operations are ongoing in the facility, there are not TSRs or accident scenarios that are specifically applicable to this feed facility mode. This is similar to the cool-down of liquid cylinders in the withdrawal facilities (C-310 and C-315) or the toll transfer and sampling facility (C-360). Therefore, the TSRs do not affect the proposed staffing requirement of one for Mode 2 in the feed facilities.

Mode 5 – Heating/Feeding/Heeling

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.

Mode 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.

The following TSRs are specifically applicable during Mode 5 and/or Mode 7:

2.2.3.1 AUTOCLAVE HIGH PRESSURE ISOLATION SYSTEM

APPLICABILITY: Modes: 3, 4, 5, 7

A pressure as high as 15 psig is assumed to indicate that a UF₆ release has occurred within the autoclave. This system places the autoclave into the containment mode, thus minimizing an external release of UF₆ (the primary path for which is the condensate drain line).

This TSR detects and initiates automatic isolation of the UF₆ release inside an autoclave. The TSR does not require any additional operator actions to mitigate or prevent the release. The operator is required to evacuate the area and notify the plant shift superintendent (PSS) in response to a UF₆ release (See and Flee policy) as delineated by the accident analysis. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

2.2.3.2 AUTOCLAVE PRESSURE RELIEF SYSTEM

APPLICABILITY: Modes 3, 4, 5, 7

This system prevents catastrophic failure of the autoclave, and subsequent uncontrolled UF₆ release, by allowing small (relative to the release associated with autoclave rupture), controlled releases in the unlikely event of concurrent UF₆ release and excessive autoclave water inventory.

The TSR does not require any additional operator actions to mitigate or prevent the release. The operator is required to evacuate the area and notify the plant shift superintendent (PSS) in response to a UF₆ release (See and Flee policy) as delineated by the accident analysis. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

2.2.3.3 AUTOCLAVE STEAM PRESSURE CONTROL SYSTEM

APPLICABILITY: Modes: 5

The accident analysis assumed an initial UF₆ 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 UF₆ vapor pressure within the cylinder, but also the volume (density) of liquid UF₆, 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.

The TSR does not require any additional operator actions to mitigate or prevent the release. The operator is required to evacuate the area and notify the plant shift superintendent (PSS) in response to

a UF₆ release (See and Flee policy) as delineated by the accident analysis. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 5.

2.2.4.1 UF₆ RELEASE DETECTION SYSTEM – AUTOCLAVE HEATED HOUSINGS, PIPING TRENCH, JET STATION, WEST WALL DETECTORS (C-337-A ONLY)

APPLICABILITY: Modes: 4, 5, 7, 8

The reaction of UF₆ and water (free atmospheric humidity) in the case of a UF₆ release produces uranyl fluoride (UO₂F₂) as particulates and hydrogen fluoride (HF) as a gas which will hydrate.

The UO₂F₂ and HF*x(H₂O) are highly visible as “smoke.” This system detects the presence of this “smoke” and alarms in the local autoclave area, the Operations Monitoring Room (OMR), and the associated area control room (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 UF₆ outleakage is also known with regard to particle size and mass concentration.

This TSR is alarm only and may be an indication of a UF₆ release and requires operator action if the system alarms. The primary action required of the operator is to evacuate the area (See and Flee policy) and notify the plant shift superintendent (PSS) in response to the potential UF₆ release. In addition, if a release is verified, the operator can actuate the Autoclave Manual Isolation System as the operator evacuates the area assuming doing so can be done safely. See the discussion associated with the Autoclave Manual Isolation System TSR below for more details of requirements for isolating UF₆ releases. A single operator can perform the required action (See and Flee) required by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

2.2.4.2 AUTOCLAVE WATER INVENTORY CONTROL SYSTEM

APPLICABILITY: Modes 5, 7

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 UF₆ 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 UF₆ 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.

The TSR does not require any additional operator actions to mitigate or prevent the release. The operator is required to evacuate the area and notify the plant shift superintendent (PSS) in response to a UF₆ release (See and Flee policy) as delineated by the accident analysis. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

2.2.4.4 CYLINDER HEATING – CYLINDER ACCOUNTABILITY WEIGHT

APPLICABILITY: Modes: 5

The thermal expansion coefficient of liquid UF₆ is such that the density of the liquid decreases dramatically as the liquid temperature increases. This difference in liquid density could allow more UF₆ 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 UF₆ placed in a 10-ton product cylinder (fill limit = 21,030 lb) at normal cylinder fill temperature would occupy only 102.1 ft³ of the available 108.9 ft³. However, when that same cylinder is heated to

normal liquefaction temperature, the liquid UF₆ would completely fill the cylinder and could potentially cause hydraulic pressures to develop inside the cylinder.

This is an administrative TSR that does not require any additional operator actions to mitigate or prevent the release. An operator has only to comply with the administrative requirements as delineated in operating procedures. Compliance with this TSR is expected of all operators regardless of how many operators are present in Feed facilities. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 5.

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

APPLICABILITY: Modes: 5

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 UF₆ 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 prevent 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 ft³ (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.

Certain serial number ranges for 48 OM cylinders also lack certified volumes, but can be safely liquefied provided there is sufficient margin to prevent 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 ft³ (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 ft³. 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 ft³. The 48 OM Allied cylinders with serial numbers AC0001 through AC0400 do not meet the 140 ft³ 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 ft³. 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 UF₆ net weight, the calculated cylinder volume, and UF₆ 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

This is an administrative TSR that does not require any additional operator actions to mitigate or prevent the release. An operator has only to comply with the administrative requirements. Compliance with this TSR is expected of all operators regardless of how many operators are present in Feed facilities. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 5.

2.2.4.6 CYLINDER HEATING AND FILLING: CYLINDER PRE-HEAT INSPECTION APPLICABILITY: Modes: 5, 7

Depending upon the degree of damage (detected during the pre-use inspection), a cylinder may or may not be capable of withstanding its hydro-pressure. A UF₆ 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 judgment of the inspector, renders it unsafe or unserviceable. Some types of cylinder damage and/or deformities are acceptable as-is or after repair.

This TSR is an administrative control and does not have any response requirements during upset conditions. An operator has only to comply with the administrative requirements. Compliance with this TSR is expected of all operators regardless of how many operators are present in Feed facilities. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 or 7.

2.2.4.7 CYLINDER HEATING – CYLINDER COLD PRESSURE CHECK APPLICABILITY: Modes: 5, 7

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 UF₆ 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 UF₆.

This TSR is an administrative control and does not have any response requirements during upset conditions. An operator has only to comply with the administrative requirements. Compliance with this TSR is expected of all operators regardless of how many operators are present in Feed facilities. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 or 7.

2.2.4.10 CYLINDER HEATING – VALVE CLARITY APPLICABILITY: Modes: 4, 5, 7

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.

This TSR is an administrative control and does not have any response requirements during upset conditions. An operator has only to comply with the administrative requirements. Compliance with this TSR is expected of all operators regardless of how many operators are present in Feed facilities. Minimum staffing requirements are not impacted by this TSR; therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 or 7.

2.2.4.11 CYLINDER HEATING – VALVE CLARITY/HEATING CYCLE INTERRUPTIONS

APPLICABILITY: Modes 4, 5, 7

The demonstration of cylinder valve clarity assures an open pathway between the cylinder void and the autoclave UF₆ 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 UF₆ present inside the cylinder. Therefore, following the demonstration of valve clarity, heating of the cylinder must resume promptly to ensure that the liquid UF₆ does not solidify on the cylinder valve. Re-solidification of the UF₆ could eliminate the pathway between the cylinder void and the autoclave UF₆ manifold.

This TSR is an administrative control and does not have any response requirements during upset conditions. An operator has only to comply with the administrative requirements. Compliance with this TSR is expected of all operators regardless of how many operators are present in feed facilities. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 or 7.

2.2.4.13 AUTOCLAVE MANUAL ISOLATION SYSTEM

APPLICABILITY: Modes 4, 5, 7, 8

The autoclave manual isolation system provides the means to remotely isolate all facility autoclaves in the event of a UF₆ release from a line outside the autoclave containment boundary. The system consists of two (within the feed facilities) actuation devices located in the Operations Monitoring Room (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 Area Control Room (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 UF₆ 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 UF₆ 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 UF₆ available for release.

During the Pigtail/Line Failure Outside Autoclave accident scenario (4.3.2.2.10) an operator is credited with actuating the autoclave manual isolation system. The autoclave manual isolation system provides the means to remotely isolate the Feed Facility autoclaves in the event of a UF₆ release from a line outside the autoclave containment boundary. The operator, while exiting the Feed Facility in accordance with the “see-and-flee” policy, would actuate the system using one of the two actuation devices within the Feed Facility to isolate the release point from the UF₆ source and limit the amount of material released. In addition, in accordance with requirements of the “see-and-flee” policy, personnel are to notify the plant shift superintendent (PSS) of the hazardous material release after leaving the area. If neither of the actuation devices can be accessed during evacuation, the autoclave manual isolation system could be initiated from the ACR.

With multiple diverse actuation locations one operator is as effective in isolating the UF₆ release as multiple operators. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

2.2.4.14 HIGH CYLINDER PRESSURE SYSTEM

APPLICABILITY: Modes 5, 7

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 UF₆ (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 UF₆ 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 UF₆ release in the autoclave.

The TSR does not require any additional operator actions to mitigate or prevent the release. The operator is required to evacuate the area and notify the plant shift superintendent (PSS) in response to a UF₆ release (See and Flee policy) as delineated by the accident analysis. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

2.2.4.15 AUTOCLAVE TEMPERATURE CONTROL SYSTEM

APPLICABILITY: Mode: 7

The accident analysis assumed that the UF₆ cylinder temperature would remain below the UF₆ triple point temperature during the controlled feeding mode to ensure UF₆ 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 UF₆ 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.

The TSR does not require any additional operator actions to mitigate or prevent the release. The operator is required to evacuate the area and notify the plant shift superintendent (PSS) in response to a UF₆ release (See and Flee policy) as delineated by the accident analysis. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 5 and 7.

None of the TSRs discussed above require operator actions that would necessitate two operators being present in the facility. The accidents of concern that may result in a UF₆ release during Mode 5, Heating/Feeding/Heeling and Mode 7, Controlled Feeding, are Autoclave Steam Control Valve Fails Open (4.3.2.2.2), Release Of Solid/Gaseous UF₆ to Atmosphere (4.3.2.2.3), Heating Of Cylinder With Excessive UF₆ (4.3.2.2.6), Heating Of Cylinder With Excessive Noncondensables (4.3.2.2.7), Heating A Damaged Cylinder (4.3.2.2.9), Pigtail/Line Failure Outside Autoclave (4.3.2.2.10), Pigtail/Line Failure Inside Autoclave (4.3.2.2.13), Cylinder Failure Inside Autoclave (4.3.2.2.14), and Cylinder Failure Outside Autoclave (4.3.2.2.15). The accident analysis does not credit any operator actions during all but one of these accident scenarios other than to evacuate the area and notify the PSS. The feed facilities Pigtail/Line Failure Outside Autoclave Scenario (4.3.2.2.10) credits the autoclave manual isolation system for isolating the facility autoclaves when a UF₆ release is detected. As discussed above for TSR 2.2.4.13, Autoclave Manual Isolation System, with multiple diverse system actuation locations one operator is as effective in isolating the UF₆ release as multiple operators in the facility. Therefore, the manual actuations credited for this accident scenario does not affect the proposed minimum staffing requirement of one for Modes 5 and 7. Therefore, Modes 5 and 7 can be supported by the proposed minimum staffing requirement of one operator without adversely affecting the safety of feed facilities operations during normal and upset conditions.

ii) Enrichment Cascade Minimum Staffing Requirements

SAR Section 6.5, Operations, states that staffing levels for the shifts for operation and support are not fixed but are based on expected or planned activities for the upcoming period. The staffing levels are based on evaluation of the needs for efficient operation and take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and TSR specified minimum staffing levels. When special or complicated activities are included in the work plans for an upcoming work period, the staffing levels will be increased as required to perform the planned activities. TSR Section 3.2.2, Facility Staff, and TSR Table 3.2.2-1, Minimum Staffing Requirements, specifies the minimum staffing level for each Facility/Function for specific modes/operations. The minimum staffing is based on the personnel required for the necessary and sufficient operator actions required to meet the expectations and/or assumptions made in the accident analysis.

As discussed in the **Reason for the Change** above, the TSR minimum staffing requirements listed in Table 3.2.2-1 delineates the staffing requirements by Mode. The current minimum staffing levels for the enrichment cascade buildings (C-331, C-333, C-335 and C-337) is the same regardless of the mode the cells and freezer/sublimers (F/S) are in. The C-331 and C-335 facilities with "00" size equipment and the C-333 and C-337 facilities with "000" size equipment have different minimum staffing requirements. The "00" facilities have a minimum staffing requirement of two operators and the "000" facilities have a minimum staffing requirement of three operators, with the difference based on the physical size of the facilities. Both the "00" and "000" minimum staffing requirements specify that at least one operator be in the area control room (ACR) for the facility. To allow additional flexibility in staffing the facilities, it is desirable to identify the minimum staffing requirements for specific modes based on criteria discussed in the previous paragraph.

There are no changes proposed for the minimum staffing requirements for the "00" and "000" facilities for the Cascade 1 (with exception noted below), Cascade 2, and the F/S 1 through F/S 5 modes. These will remain at two and three operators for the "00" and "000" facilities, respectively. The minimum staffing requirements for the Cascade 3 mode will change from three for "000" and two for "00" to zero. This change is supported by an evaluation (see evaluation at end of this enclosure) of the applicable TSRs for the modes, accident scenario assumptions for the applicable TSR systems, and personnel required for necessary and sufficient operator actions required by expectations and/or assumptions made in the accident analysis. The proposed minimum staffing levels are consistent with the minimum number of operations staff required to safely operate the facility during normal and upset conditions.

The second proposed change to the minimum staffing requirements table is not specific to all the operations that can be performed during the Cascade 1 mode, but is a unique type of operations that can be performed during the mode. The Cascade 1 mode, Below Atmospheric Pressure, is defined as "Stage high-side pressure is < 14.5 psia for "000" cells and C-310 cells, and < 13.5 psia for "00" cells". During this mode several operations can be performed ranging from normal on-stream enrichment operation of the cell (but below atmospheric pressure) to off-stream (with or without the compressors running) operation of the cell. As long as the cell is below atmospheric pressure and has some quantity of UF₆, (i.e., the cell is not at UF₆ negative), the cell is in the Cascade 1 mode. A UF₆ negative is defined as less than 10 ppm. The proposed change will allow the minimum staffing requirement to be relaxed if the cell is shutdown with no enrichment operations ongoing (no cell/booster motors running), and only operations involved with: 1) maintaining a fluorinating environment or dry air blanket due to a UO₂F₂ deposit within the cell, or 2) operating a P&E and associated valves, headers, and surge drums. During this specific condition, the minimum staffing would be reduced from three for the "000" facilities and two for the "00" facilities to one operator in

each facility. This proposed change is supported by an evaluation (see evaluation at end of this enclosure) of the applicable TSRs for the modes, accident scenario assumptions for the applicable TSR systems, and personnel required for necessary and sufficient operator actions required by expectations and/or assumptions made in the accident analysis. The proposed minimum staffing levels are consistent with the minimum number of operations staff required to safely operate the facility during normal and upset conditions.

The third proposed change to the minimum staffing requirements table is a special exemption applicable during specific limited UF₆ operations during Cascade 1 mode with the enrichment cascade and related auxiliary equipment (Booster Stations, F/Ss, P&E pumps etc.) shutdown. If the facility enrichment cascade, including booster stations, is shutdown and in Cascade 3 mode, the pipe headers and surge/storage drums may still be used for UF₆ transfers and support of maintenance/operations in other facilities. Headers, P&E pumps and surge drums do not have to be in Cascade 3 mode, but do have to be below atmospheric pressure. Equipment that does not involve UF₆ (no applicable TSRs) can be operated as necessary with no impact on minimum staffing. As described above, many operations can be performed during Cascade 1 mode with UF₆ pressure below atmospheric pressure as defined above. During limited operations involving equipment, headers and surge drums containing UF₆, the proposed minimum staffing requirement is zero. This proposed change is supported by an evaluation (see evaluation at end of this enclosure) of the applicable TSRs for the modes, accident scenario assumptions for the applicable TSR systems, and personnel required for necessary and sufficient operator actions required by expectations and/or assumptions made in the accident analysis. The evaluation found that there are no specific operation actions (except See and Flee) for the proposed limited operations involving equipment, headers and surge drums containing UF₆ described above. The proposed minimum staffing level of zero is consistent with the minimum number of operations staff required to safely operate the facility during normal and upset conditions.

The fourth proposed change to the cascade facility minimum staffing requirement will revise TSR Table 3.2.2-1 footnote "a." to make it clear that the cascade ACRs are manned as required by operating mode. Currently, footnote a. of TSR Table 3.2.2-1 specifies that the C-331, C-333, C-335, and C-337 ACRs shall always be manned. This requirement could conflict with the proposed changes to the cascade minimum staffing requirements. The proposed change to footnote "a." would require the ACRs be manned when required by specific operating mode. This is currently the manning requirement for the C-310, C-315, C-333-A, and C-337-A ACRs/OMRs. Each of the existing and proposed minimum staffing requirements for the cascade facilities specify whether the ACR must be manned in the Work Area Definition column.

The minimum staffing requirements for each facility is based on the personnel required for the necessary and sufficient operator actions required to meet the expectations and/or assumptions made in the accident analysis and specified in the TSRs. Each of the enrichment cascade facility TSRs with applicability for Cascade 1 (with specified restrictions), Cascade 3, and F/S 6 modes has been evaluated (see evaluation at end of this enclosure) for the proposed changes to the minimum staffing requirements. Not all TSRs have applicability specific to individual modes. All of the enrichment cascade TSRs have been evaluated/discussed with respect to the impact on the proposed minimum staffing for the specific modes/operations discussed above.

Each of the enrichment cascade facility TSRs with applicability for Cascade 1, Cascade 3, and F/S 6 modes has been evaluated for the proposed changes to the minimum staffing requirements. Not all TSRs have applicability specific to individual modes. All of the enrichment cascade TSRs were evaluated/discussed with respect to the impact on the proposed minimum staffing for the specific modes/operations discussed in the **Reasons for the Change(s)** section above. The following table of TSRs and associated required actions, surveillances, etc., has been evaluated for the impact on the proposed minimum staffing requirements.

The results of the evaluation of the enrichment cascade TSRs determined that the required operator actions including daily or less frequent surveillances can be performed by the proposed staffing level in the facilities. The evaluation also determined that for the Cascade 1 (with specified restriction) Cascade 3 and F/S 6 modes there does not have to be any operator continuously assigned and within the facility.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
2.4.2.1	Freezer/Sublimator UF ₆ Weight Limit	All F/S modes	NO	NO	This is a Safety Limit (SL) and has no operator actions specified. For the F/S 6 mode the F/S is empty of UF ₆ and the R-114 is drained. TSR does not require minimum staffing. See TSR 2.4.3.1 for evaluation of the F/S high-high weight trip system that is credited with ensuring this SL is not exceeded.
2.4.2.2	Coolant (R-114) Overpressure Protection Systems	All Cascade Modes	NO	NO	This is a SL and has no operator actions specified. During the proposed Cascade 1 mode and Cascade 3 mode the cells/equipment are shutdown (enrichment cascade is shutdown with no motors running). TSR does not require minimum staffing requirements during any mode including the modes with proposed changes. This SL also is applicable to the boosters and P&E pumps in enrichment cascade facilities and also the purge cascade in C-310. See TSR 2.4.3.4 for evaluation of the R-114 coolant overpressure control system that is credited with ensuring this SL is not exceeded for the equipment listed.
2.4.2.3	Cascade Pressure Limit	All Cascade Modes	NO	NO	This is a Safety Limit and has no operator actions specified. During the proposed Cascade 1 mode and Cascade 3 mode the cells/equipment are shutdown (enrichment cascade is shutdown with no motors running), therefore the cascade is well below the limits in this TSR. TSR does not require minimum staffing requirements during any mode including the modes with proposed changes. See TSR 2.4.4.11 for evaluation of the system that is credited with ensuring this SL is not exceeded.
2.4.3.1	Freezer/Sublimator High-High Weight Trip System	F/S 1, F/S 3	NA	NA	NA

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
2.4.3.2	Freezer/Sublimer UF ₆ Vent Line Manual Block Valve	F/S 1, F/S 3, F/S 5	NA	NA	NA
2.4.3.3	Freezer/Sublimer R-114 Vent Line Manual Block Valve	F/S 1, F/S 3	NA	NA	NA
2.4.3.4	R-114 Coolant Overpressure Control System	Cascade 1* Cascade 2* (* - Only when process motors are energized and an R-114 negative has not been established on the affected cell[s].)	YES	NA	<p>The specific condition for the proposed changes for Cascade 1 minimum staffing requires a shutdown cascade – no motors energized. When the enrichment cascade is shutdown, none of the facility booster stations are operating with the associated process motors.</p> <p>If an enrichment cascade facility P&E pump is required to be operated during conditions when the cascade is not enriching UF₆ (cell motors de-energized), the proposed minimum staffing requirement of one operator is sufficient for the safe and efficient operation of the P&E pump during normal operation. Normal operation of a P&E pump is assumed to always be below atmospheric pressure thus Cascade 1.</p> <p>Required Actions A.1, C.1 and E.1 require immediate continuous monitoring of the R-114 system pressure-temperature in order to take action to lower pressure if the R-114 coolant pressure control system is inoperable, isolation valve found closed/unsealed, or the cavity vent port is found not open to atmosphere. If the R-114 coolant overpressure system is found inoperable (for any reason specified above) a single operator can satisfy the Required Actions to take action to lower pressure by simply shutting down the P&E pumps if a dedicated operator is not available to continuously monitor the P&E R-114 coolant pressure-temperature. If the enrichment cascade is shutdown, operation of the P&E pumps will</p>

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>be periodic and not necessary to be continuous. If a P&E pump R-114 coolant pressure control system is found inoperable prior to starting the pumps, the TSR does not allow starting the pumps without an operable system (TSR 1.6.2.2[d] is applicable). It is very unlikely that the P&E pumps R-114 coolant pressure control would be found inoperable during operation of the pumps. Therefore, the operation of the P&E pumps when the enrichment cascade is shutdown will be safe with a minimum staffing of one operator.</p> <p>Surveillance Requirements (SR) require calibration and testing of the R-114 coolant pressure control system on a quarterly frequency. The quarterly SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.3.5	Intermediate Gas Removal High Temperature Control System	NA	NA	NA	TSR Deleted
2.4.4.1	UF ₆ Release Detection System	Cascade 2	NA	NA	NA
2.4.4.2	Criticality Accident Alarm System	Not mode dependent – All modes assumed.	YES	YES	<p>Required Action A.1.2 requires monitoring of temperature-pressure in the cascade cells containing UF₆ enriched to ≥ 1 wt. % ²³⁵U hourly to maintain UF₆ in a gaseous state.</p> <p>Required Action A.1.5 requires monitoring of temperature and pressure in the surge drums containing UF₆ enriched to ≥ 1 wt. % ²³⁵U hourly to maintain UF₆ in a gaseous state.</p> <p>The above required actions could be safely performed by a single operator (proposed minimum staffing during the Cascade 1 mode)</p>

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>in the facility. During the Cascade 3 and F/S 6 modes, an operator outside the facility can enter and perform the necessary hourly monitoring. The operator does not have to be continuously in the facility.</p> <p>Surveillance Requirements (SR) require calibration and testing of the CAAS system on a quarterly and annual frequency. The annual and quarterly SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p> <p>The only other action of operator is to evacuate the facility if CAAS alarms.</p>
2.4.4.3	Cascade Equipment Assay Limitations	All	YES	YES	<p>The TSR specifies the maximum ²³⁵U assay for specific equipment with lower assay limitations and less than 5.5 wt. % ²³⁵U for all other equipment. There are no specific operator actions if the enrichment cascade is shutdown and not enriching uranium.</p> <p>The TSR has a surveillance to measure the product stream assay twice daily. This surveillance is performed in C-310 thus will not impact the proposed changes to the enrichment cascade (C-331, C-333, C-335, & C-337) minimum staffing.</p>
2.4.4.4	Cascade Wet Air Inleakage	Cascade 1 Cascade 2 when ≥ 1% assay	YES	NA	<p>When a cell or other equipment/piping contains UO₂F₂ deposit(s) in a pipe or component listed in TSR 2.4, Appendix A, and the deposit(s) are estimated to be greater than the safe mass as determined by TSR 2.4, Appendix B, then the cell or other equipment/piping must comply with the moderation control requirements specified in the TSR. This usually is satisfied by maintaining the deposit in a fluorinating (including chemical treatment) environment. This TSR has two surveillance requirements that must be completed each shift. One requirement</p>

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>is to verify the cell coolant pressure is greater than building RCW pressure and the other requirement is to monitor the dry gas blanket system pressure required by Condition B (if utilized) and adjust pressure to ≥ 14 psia.</p> <p>The surveillances/actions discussed above could be safely performed by a single operator (proposed minimum staffing during the Cascade 1 mode with enrichment cascade shutdown) in the facility.</p>
2.4.4.5	Fire Protection System - Building Sprinkler System	Cascade 1 through Cascade 3	YES	YES	<p>If the building sprinkler system is operable there are no required actions that need to be performed by the operator. If the building sprinkler system is not operable then Required Action B.1 requires hourly fire patrols for the affected area(s) of the affected building(s).</p> <p>The fire patrol task is completed by a dedicated person trained to perform the fire patrols. The fire patrols are not considered when evaluating the minimum staffing requirements for the facilities. Fire patrols are not performed by any person fulfilling a TSR minimum staffing requirement.</p> <p>Surveillance Requirements (SR) require calibration and testing of the sprinkler system on a monthly and annual frequency. The monthly and annual SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.4.6	Fire Protection System - High Pressure Fire Water Distribution Mains	Whenever sprinkler system is required	YES	YES	<p>If a sectional valve found to be not in the open position then Required Action B.1 requires confirmation of the water supply on both sides of the closed valve. This action is completed by member(s) of the fire department and not an operator assigned to</p>

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>the impacted facility.</p> <p>If this action is not accomplished, Required Actions C.1 and C.2 require a fire patrol and a temporary water supply for the affected sprinkler systems. As above, a fire patrol is performed by dedicated personnel specifically trained for fire patrols. Fire patrols are not performed by any person fulfilling a TSR minimum staffing requirement. The other action to provide a temporary water supply is not performed by an operator assigned to the impacted facility and fulfilling a TSR minimum staffing requirement.</p> <p>Surveillance Requirements (SR) require calibration and testing of the sprinkler system on a monthly and annual frequency. The monthly and annual SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.4.7	Fire Protection System - Water Supply Basin	Whenever sprinkler system is required	YES	YES	<p>The TSR has Required Actions when the system is degraded. As delineated in the discussion for TSR 2.4.4.4 above, none of these actions are performed by operators assigned to the impacted facility. These actions would be coordinated by the PSS as this system is used for other facilities on site.</p> <p>Surveillance Requirements (SR) require calibration and testing of the system on a monthly and annual frequency. The monthly and annual SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.4.8	Fire Protection System - High Pressure Fire Water Pumps	Whenever sprinkler system is required	YES	YES	<p>The TSR has Required Actions when the system is degraded. As delineated in the discussion for TSR 2.4.4.4 above, none of these actions are performed by operators assigned to the impacted facility. These actions would be coordinated by the PSS as this</p>

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>system is used for other facilities on site.</p> <p>Surveillance Requirements (SR) require calibration and testing of the system on a monthly and annual frequency. The monthly and annual SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.4.9	Fire Protection System - High Pressure Fire Water Storage Tank	Whenever sprinkler system is required	YES	YES	<p>The TSR has Required Actions when the system is degraded. As delineated in the discussion for TSR 2.4.4.4 above, none of these actions are performed by operators assigned to the impacted facility. These actions would be coordinated by the PSS as this system is used for other facilities on site.</p> <p>Surveillance Requirements (SR) require calibration and testing of the system on a monthly and annual frequency. The monthly and annual SRs are not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.4.10	Fire Protection System - Hot Work Limitations	All	NO	NO	<p>A dedicated, continuous fire watch, equipped with portable fire suppression equipment, shall be posted for hot work operations conducted when the applicable building sprinkler system is not operable.</p> <p>The fire watch task is completed by a dedicated person trained to perform the fire watches. The fire watch are not considered when evaluating the minimum staffing requirements for the facilities.</p>
2.4.4.11	Cascade Pressure Limitation	Cascade 1 Cascade 2	YES	NA	<p>For the Cascade 1 (with enrichment cascade shutdown) mode, the cascade is well below the limits in this TSR. This surveillance requires a daily verification that the operating cells have high-side pressures ≤ 25 psia. For most operating conditions for the proposed Cascade 1 (with enrichment cascade shutdown) the cell(s) will not be operating and the compressors will not be running. Thus there is</p>

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>no impact on the proposed minimum staffing requirements. While maintaining a fluorinating environment in accordance with TSR 2.4.4.4, the cells may or may not be operating. This includes cell chemical treatment operations. During these operating conditions, the surveillance would be required.</p> <p>The surveillance discussed above could be safely performed by a single operator (proposed minimum staffing during the Cascade 1 mode [with enrichment cascade shutdown]) in the facility. If the cell stage motors are not running in a cell, the surveillance is not required. The surveillance is only performed on operating cells. The surveillance exemption is not specified in the TSR applicability statement as would be expected, but specified in the actual Surveillance Requirement; "Verify operating cells have high-side pressures ≤ 25 psia." Operating cells have their stage motors running.</p> <p>If the enrichment cascade is shutdown in a facility and there are no cell, booster station, or P&E pumps energized, UF₆ can still be flowing through the building. During vapor transfers or other operations, the process piping in a shutdown cascade enrichment facility may be utilized to transfer UF₆. During this transfer operation, the UF₆ would remain below atmospheric pressure. Assuming no cells or booster stations are used to provide flow/pressure, there is no significant risk of this flow exceeding atmospheric pressure. In addition, the quantity of UF₆ available for release is limited and generally any system breach would likely only result in in-leakage into the system. Any UF₆ release would be bound by the SAR accident analysis scenario described in 4.3.2.1.4, Limited UF₆ Release to Atmosphere. See and Flee is the only credited control for this scenario. No operator actions are</p>

Note:A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

Enrichment Cascade Facilities TSRs with Applicability for the Cascade 1 and Cascade 3-F/S 6 modes.

TSR #	TSR Title	Applicable Modes	Operator Action (Y/N) ^{see note}		Discussion/Justification
			Cascade 1 (S/D) & F/S 6	Cascade 3 & F/S 6	
					<p>required other than See and Flee. With no energized equipment and only less than atmospheric pressure UF₆ flow through process piping, minimal operator oversight is required. The daily surveillance to verify cascade stage high side pressure discussed above could be safely performed by a single operator not continuously in the facility. This is a proposed exception to the normal Cascade 1 mode minimum staffing requirement.</p> <p>The annual TSR surveillance is not performed by operators assigned to the building and have no impact on the daily minimum staffing requirements.</p>
2.4.4.12	Cascade Cell Trip Function	Cascade 1 Cascade 2 with stage motors energized	NA	NA	The proposed revision to minimum staffing for Cascade 1 mode requires that the enrichment cascade be shutdown and a fluorinating environment or dry air blanket be maintained, thus no stage motors are energized. Therefore this TSR has no impact on the proposed minimum staffing change since the stage motors will be de-energized.
2.4.4.13	Heavy Equipment Handling	Cascade 2	NA	NA	NA
2.4.4.14	Heating UF ₆ Plugs	At all times	NO	NO	There are no required specific operator actions in this TSR.
2.4.4.15	Motor Load Indicators	Cascade 1 Cascade 2 with stage motors energized	NA	NA	The proposed revision to minimum staffing for Cascade 1 mode requires that the enrichment cascade be shutdown and a fluorinating environment or dry air blanket be maintained, thus no stage motors are energized. Therefore this TSR has no impact on the proposed minimum staffing change since the stage motors will be de-energized.

Note: A staffing requirement exists (YES response in matrix) when the TSR has specific operator actions as required by the TSR. The specific operator action requirement will be discussed/evaluated in the Discussion/Justification column of the matrix. If the TSR does not have any operator actions specified in the action steps or surveillances (NO response in matrix) then no staffing requirement exists. If the TSR is not applicable during the modes with proposed changes (NA response in matrix) then no staffing requirement exists.

iii) Power Operations and Utilities Operations

The minimum staffing requirements for Power Operations and Utilities Operations personnel are included in TSR 3.2.2, Facility Staff, generally and listed specifically in TSR Table 3.2.2-1, Minimum Staffing Requirements.

The minimum staffing requirements for Power Operations and Utilities Operations were determined to be zero since these positions do not require any safety actions that are credited in the accident analysis or associated TSR required actions. This was determined after a thorough review of the accident analysis scenarios and the TSRs within Section 2.0, Facility-Specific Technical Safety Requirements.

Unlike most of the other minimum staffing requirements, the "Onsite" Power Operations and Utilities Operations are not assigned to a unique facility nor are there specific modes or operations that are applicable for them. The work area definition only states that the personnel must be on-site. In addition, there is currently one Power Operator that is required to be in the C-300 facility. A review of the accident analysis scenarios in SAR Chapter 4.3 did not identify any specific credited mitigative or preventive action specifically identified for the personnel assigned to Power Operations or Utilities Operations. Review of the TSRs in Section 2.0, Facility Specific Technical Safety Requirements only identified one instance that could potentially apply for Power Operations. No TSR actions were identified with the potential to apply to Utilities Operations personnel. TSR 2.4.4.12, Cascade Cell Trip Function, is credited in numerous SAR Chapter 4 discusses numerous cascade cell-related scenarios (e.g., 4.3.2.1.1, 4.3.2.1.2, 4.3.2.1.3, 4.3.2.1.5, 4.3.2.1.7, and 4.3.2.1.8) in which operating personnel respond to certain process condition and alarms by de-energizing the process motors ("tripping the cell"), thus bringing the cell below atmospheric pressure and preventing/mitigating a UF₆ release. During normal conditions, the cell trip is accomplished by pressing the area control room (ACR) or central control facility (CCF) compressor motor stop button. If the motor stop buttons are inoperable the TSR Required Action(s) state that there is a potential need to utilize an alternate means of cell shutdown. This includes stationing an operator at an established alternate location with communications to the ACR or CCF. The TSR Required Action(s) do not specify or imply that this alternate cell trip location be manned by Power Operations personnel. The Required Action(s) only states that an operator be stationed at an established alternate cell shutdown location, which could be any person trained to fulfill this position. This safety related action could be performed by anyone with sufficient skill that has had any necessary training.

As stated above, Utilities Operations personnel do not have any credited mitigative action in the accident analysis scenarios in SAR Chapter 4.3 or in the TSR required actions. In addition, SAR Section 3.9, Utilities, was reviewed for credited safety actions of Utilities Operations personnel. Utilities systems are essential for plant operation, but none of these systems are credited to perform a safety function other than to fail safe.

Therefore, minimum staffing requirements for Power Operations and Utilities Operations were determined to be zero since these positions do not require any safety actions that are credited in the accident analysis or associated TSR required actions. The staffing levels for the Power Operations and Utilities Operations positions will be determined by operational needs for the upcoming planned activities.

The criticality accident scenario is not discussed in this evaluation because the minimum staffing requirement is not applicable to the prevention of a criticality. An operator is expected to comply with the controls put in place to prevent a criticality including monitoring for UF₆ releases. If a criticality event occurs, the operator is required to evacuate the area and contact the PSS. Therefore, no further discussion of criticality is included in this evaluation.

Enclosure 3
GDP 12-0033

USEC-01
Certificate Amendment Request
Revise Table 3.2.2-1, Minimum Staffing Requirements
Removal/Insertion Instructions

Certificate Amendment Request Paducah Gaseous Diffusion Plant Letter GDP 12-0033 Removal/Insertion Instructions	
Remove Pages	Insert Pages
APPLICATION FOR UNITED STATES NUCLEAR REGULATORY COMMISSION CERTIFICATION VOLUME 2	
SAR Section 6.5 6.5-3	SAR Section 6.5 6.5-3
APPLICATION FOR UNITED STATES NUCLEAR REGULATORY COMMISSION CERTIFICATION VOLUME 4	
TSR Section 3.0 3.0-4	TSR Section 3.0 3.0-4

are located in the CCF. The plant power system is monitored and controlled through a communication network with the power suppliers. Typical operational activities that are monitored and controlled from the CCF include determining and establishing optimal plant power level, executing or altering the maintenance work plan if necessary, and maintaining necessary manpower level to support plant operations.

Staffing levels for the shifts are not fixed but are based on the expected or planned activity for the shift period. Staffing levels take into account the routine monitoring of plant equipment including operator rounds, expected operational activity level, facility size, and Technical Safety Requirement (TSR) specified staffing requirements. When special activities are included in the work plans, the staffing will be increased as required to perform the planned activity. The required minimum staffing level for Paducah is approximately 29 as detailed in Section 3 of the TSRs. This is a fraction of the normal average shift staffing of approximately 80 persons.

Each shift organization is composed of a PSS; a cascade coordinator (CC) who directs overall cascade activities; shift engineer; first-line managers for the cascade buildings, UF₆ handling facilities, security, fire services, maintenance and power operations and utility operations; health physics technicians; Security Shift Commander; Fire Services Shift Commander; and operators, instrument mechanics, Security Police officers, and firefighters. Less than this normal shift staffing is permitted for short periods with the concurrence of the PSS to allow for call-ins or other compensatory actions.

The PSS provides a direct chain of command from the Operations Manager, Shift Operations Manager, Plant Manager and General Manager to the shift operating staff and serves as the senior shift manager in directing activities and personnel. The operations line organization is accountable to the PSS for reporting plant status.

The CC provides managerial oversight, operations coordination, and assures adequate staffing for all cascade operations on a 24-hour basis. This person approves, directs, and integrates all significant cascade operational activities under the oversight of the PSS.

The remaining members of the shift organization provide the needed functions for round-the-clock operations. First-line managers provide management for, coordination of, and assurance for proper execution of assigned tasks. The shift engineer provides engineering support for technical issues involving operations. Health physics technicians provide support for 24-hour shift operations. The first-line manager for Security supervises the activities necessary to ensure the protection of plant facilities, government property, and classified information. The first-line manager for fire services supervises shift fire services work activities and responds to plant emergency events.

SECTION 3.0 ADMINISTRATIVE CONTROLS
Table 3.2.2-1 Minimum Staffing Requirements^a

Facility Function	Mode/Operation	Staffing Requirements ^b	Work Area Definition
C-300 ^g	All	2	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site.
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	1	One person in the operating facility or immediately surrounding grounds including the local cylinder yard.
	3, 4, 8	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-337-A ^b			
C-310	Product withdrawal	2 ^c	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
	1, 2, 3, 4 Cascade 1, 3		
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.
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 be manned **when required by operating mode**. 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 UF6 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 UF6 (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 and associated valves, headers, and surge drums.

f. Staffing requirements is zero for limited operations involving equipment, headers and surge drums containing UF6 if: 1) UF6 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), Fire Services, Security Services, 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.

Enclosure 4
GDP 12-0033

USEC-01
Certificate Amendment Request
Revise Table 3.2.2-1, Minimum Staffing Requirements
Significance Determination

**Enclosure 4
GDP 12-0033**

**USEC-01
United States Enrichment Corporation (USEC)
Certificate Amendment Request
Revise Table 3.2.2-1, Minimum Staffing Requirements
Significance Determination**

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

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

None of the Conditions to the Certificate of Compliance specifically address the subject TSR sections that are being revised. Thus, the proposed change will have no impact on any of the Conditions to the Certificate of Compliance.

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

The accidents of concern for the proposed change in the minimum staffing levels for feed facility modes are nearly all the accidents associated with the facility. The probability of occurrence for the relevant accident scenarios are identified as being within the anticipated event (AE) or evaluation basis event (EBE) frequency ranges. The accident analysis does not credit any operator actions during all but one of these accident scenarios other than to evacuate the area and notify the PSS. The feed facilities Pigtail/Line Failure Outside Autoclave Scenario (4.3.2.2.10) credits the autoclave manual isolation system for isolating the facility autoclaves when a UF₆ release is detected. As discussed in Enclosure 2 for TSR 2.2.4.13, Autoclave Manual Isolation System, with multiple diverse system actuation locations one operator is as effective in isolating the UF₆ release as multiple operators in the facility. Therefore, Modes 1, 2, 5 and 7 can be supported by the proposed minimum staffing requirement of one operator without adversely affecting the safety of feed facilities operations during normal and upset conditions. The administrative controls credited in the accident analysis are not dependent on minimum staffing requirements. The operator is only required to evacuate the area and notify the Plant Shift Superintendent (PSS) upon detection of a UF₆ release or activation of the criticality accident alarm system (CAAS). In addition, each specific TSR that is applicable during the modes being impacted by these proposed minimum staffing changes was reviewed and found to be not impacted the number of operators in the feed facilities.

The proposed minimum staffing requirement changes do not adversely affect the initial conditions (temperature, pressure, etc.) or potential initiators for the relevant accidents evaluated in the SAR.

The accidents of concern for the proposed change in the minimum staffing levels for the cascade enrichment facility modes are nearly all the accidents associated with the facility. The probability of occurrence for the relevant accident scenarios are identified as being within the anticipated event (AE) or evaluation basis event (EBE) frequency ranges.

During the evaluation of the proposed changes to the enrichment cascade minimum staffing requirements, each of the TSRs applicable during the modes associated with the proposed changes was evaluated for required actions and surveillances required by operators assigned to the facility. This is documented in Enclosure 2, Justification of Change(s). The minimum staffing requirements for each facility is based on the personnel required for the necessary and sufficient operator actions required to meet the expectations and/or assumptions made in the accident analysis and specified in the TSRs. In all cases, the proposed minimum staffing was found to be adequate to complete the required operator actions and perform the required operator surveillances.

Several of the applicable accident scenarios require specific operator actions to trip impacted cell(s)/equipment, but only for cells/equipment that contain UF₆ and the motors are energized. The operator is required to trip the cell(s)/equipment if an upset condition is identified. The proposed minimum staffing requirement for Cascade 1 (enrichment cascade shutdown, with operations per TSR 2.4.4.4 or P&E pump operation) will be one operator. It was determined that since the proposed Cascade 1 (shutdown) mode/operation assumes that the enrichment cascade is shut down in the facility, then the accident analysis required action is not necessary and one operator in the facility is adequate and safe. When in Cascade 1, with limited operating conditions (enrichment cascade shutdown, no equipment running, and below atmospheric UF₆ in equipment, header and surge drums), the proposed minimum staffing will be zero operators. It was determined that since the proposed Cascade 1 (shutdown) mode/operation assumes that the enrichment cascade is shut down in the facility, and no equipment is running, then accident analysis required action is not necessary and no operator is required to be constantly in the facility. During the Cascade 3 and F/S 6 modes of operation, the cascade cell/equipment is not operating and the system is at UF₆ negative. If the cells are not running, cell trip is not necessary.

The accident analysis also assumes certain administrative controls are in place for the prevention/mitigation of initiating events postulated. The administrative controls are not dependent on minimum staffing requirements; they are required regardless of staffing levels.

In addition, regardless of minimum staffing, the operator is to evacuate the area and notify the Plant Shift Superintendent (PSS) upon detection of a UF₆ release or activation of the criticality accident alarm system (CAAS). This can be accomplished by the single operator if in the Cascade 1 (shutdown) mode. If the facility is in the Cascade 3 and F/S 6 mode, there is no risk of a UF₆ release and if CAAS alarms, the alarm condition is also annunciated outside the facility and in C-300.

No new or changed operations of the system or any of its equipment or components are proposed. Therefore, the proposed changes will not significantly increase the probability of occurrence or the consequences of previously evaluated accidents.

3. No New or Different Type of Accident

The proposed changes to the feed and cascade facilities minimum staffing requirements do not affect the essential controls or required operator actions for any scenario in the accident analysis. The proposed changes do not create any new failure modes or create initiating events that are different than previously evaluated in the SAR. Thus, the proposed changes will not create a new or different type of accident.

Therefore, the proposed change will not create a new or different type of accident.

4. No Significant Reduction in Margins of Safety

The proposed changes to TSR Table 3.2.2-1, Minimum Staffing Requirements, for the feed facilities, C-333-A and C-337-A, as described in Enclosure 2, description of changes, will reduce the minimum staffing requirements for modes 1, 2, 5 and 7 which currently require two operators. The proposed minimum staffing will be reduced to one for modes 1, 2, 5, and 7. The minimum staffing requirements for the remaining feed facility modes are unchanged. The proposed minimum staffing requirements are consistent with the number of operations staff required to safely operate the facility during normal and accident conditions.

The proposed changes to TSR Table 3.2.2-1, Minimum Staffing Requirements, for the cascade enrichment facilities, C-331, C-333, C-335 and C-337, as described in Enclosure 2, Description of Changes, will provide staffing flexibility during limited (enrichment cascade shutdown) UF₆ operations. The proposed minimum staffing requirements are consistent with the number of operations staff required to safely operate the facility during normal and accident conditions as demonstrated in the evaluation included in Enclosure 2, Justification of Change(s). In addition, the proposed changes to the TSR minimum staffing requirements do not directly or indirectly change any plant operation, configuration, controls, components, or equipment. Therefore, the proposed changes will not have any impact on the margins of safety.

The proposed changes to TSR Table 3.2.2-1, Minimum Staffing Requirements, for the power and utility operators described in Enclosure 2, Description of Changes, will provide staffing flexibility. The proposed minimum staffing requirements are consistent with the number of operations staff required to safely operate the facility during normal and accident conditions as demonstrated in the evaluation included in Enclosure 2, Justification of Change(s). In addition, the proposed changes to the TSR minimum staffing requirements do not directly or indirectly change any plant operation, configuration, controls, components, or equipment. Therefore, the proposed changes will not have any impact on the margins of safety. None of the TSRs have margin of safety discussions related to mode applicability or minimum staffing. Therefore, the proposed

changes do not reduce any TSR margins of safety.

5. No Significant Decrease in the Effectiveness of Any Programs or Plans Contained in the Certificate Application

The proposed changes to TSR Table 3.2.2-1 do not impact or change any programs or plans in the certificate application. It has been determined that the minimum number of staff specified in TSRs for specific Feed Facilities or Cascade Facilities modes or requirements for Power Operations and Utilities Operations can be reduced as proposed above without adversely affecting the safety of the facilities regulated operations. Since the proposed TSR minimum staffing requirement changes do not alter the response actions and mitigative functions that are addressed in the Emergency Plan (EP) and its implementing procedures and facility Emergency Response Plans, there is no decrease in the effectiveness of the Emergency Plan.

Therefore, the proposed changes will not decrease the effectiveness of any programs or plans contained in the Certificate Application.

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

Due to the fact that there is no significant increase in the probability or consequences of any accident previously analyzed and no new or different type of accident, as discussed in items 2 and 3 above, there will be no undue risk to the public health and safety due to the proposed changes. In addition, the proposed changes will have no impact on plant effluents or on the programs and plans in place to implement physical security, protection of classified matter, transportation security, or special nuclear material accountability.

Therefore, the proposed changes to the TSRs will not pose any undue risk to the public health and safety, common defense and security, or the environment.

7. No Change in the Types or Significant Increase in the Amounts of Any Effluents that May be Released Off-Site

The proposed changes to the TSRs do not involve any physical change to the plant or changes to plant operations that could change the types or increase the amounts of any effluents that may be released offsite.

Therefore, the proposed changes do not change the type or significantly increase the amount of effluents that may be released offsite.

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

The proposed changes to the TSRs will not affect the radiological protection program description or the actions in place to minimize occupational exposures.

Therefore, there is no significant increase in individual or cumulative occupational radiation exposure as a result of the proposed changes.

9. No Significant Construction Impact

These proposed changes will not require any construction. The proposed changes to TSR Table 3.2.2-1 has no construction impact.

Therefore, since there is no construction, there are no significant construction impacts associated with the proposed changes.