



December 15, 2010
GDP 10-0042

Ms. Cathy Haney
Director, Office of Nuclear Material Safety and Safeguards
Attention: Document Control Desk
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) – C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and 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 TSRs 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and 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 SAR pages have been evaluated in accordance with 10 CFR 76.68. Based on the results of the 10 CFR 76.68 evaluation, the enclosed SAR pages do not require prior NRC review and approval and are 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 change will revise the C-360 modes to split Mode 2, Autoclave Open or Out of Service into two modes, Mode 2A, Autoclave Open, and Mode 2B, Out of Service. This will allow more flexibility in specifying mode minimum staffing requirements. The minimum staffing requirements for modes 2A, 6 and 7 will be revised to only require one operator instead of the current two. Mode 2B, Out of Service, will be revised to have a minimum staffing requirement of zero. The minimum staffing requirements for the modes 1a, 1b, 3, 4, 5, and 8 will remain unchanged. In addition, the applicable modes for TSRs 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting and 2.1.4.14, Cylinder Handling – Cylinder Disconnection will be changed from 2 to 2A. The new 2B, Out of Service will not be applicable for these TSRs since no operations are performed within this mode.

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

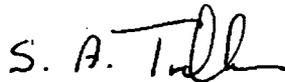
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NM5501

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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. United States Enrichment Corporation (USEC), Certificate Amendment Request, Revise C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and Table 3.2.2 1, Minimum Staffing Requirements
3. Certificate Amendment Request, Paducah Gaseous Diffusion Plant, Letter GDP 10-0042, Removal/Insertion Instructions
4. United States Enrichment Corporation (USEC), Certificate Amendment Request, Revise C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and Table 3.2.2-1, Significance Determination.

cc: J. Calle, NRC Region II Office
M. Miller, NRC Sr. Resident Inspector - PGDP
T. Liu, NRC Project Manager - HQ

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Enclosure 1
GDP 10-0042
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 10-0042, 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

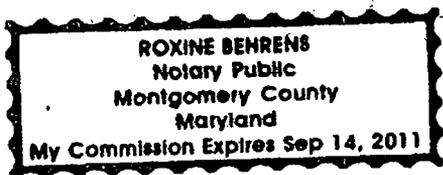
Steven A. Toelle

On this 15th day of December, 2010, 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.

Roxine Behrens

Roxine Behrens, Notary Public
State of Maryland, Montgomery County
My commission expires September 14, 2011



**Enclosure 2
GDP 10-0042**

USEC-01

Certificate Amendment Request

Revise C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and Table 3.2.2-1, Minimum Staffing Requirements

**United States Enrichment Corporation (USEC)
 Certificate Amendment Request
 Revise C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder
 Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection,
 and Table 3.2.2-1, Minimum Staffing Requirements**

Detailed Description and Justification of the Changes

1) Description of Change

The current C-360 mode 2, Autoclave Open or Out of Service, is a combination of two different operational modes. The proposed change will split this mode into two separate modes, 2A, Autoclave Open, and 2B, Out of Service. Separating the modes will allow flexibility with respect to C-360 minimum staffing requirements. Currently, C-360 modes 1a, 2, 6, and 7 require two operators to be in the facility or immediately surrounding grounds. Modes 6, 7 and the new Mode 2A will have their minimum staffing level changed from two operators to one operator. The proposed minimum staffing level for the other new mode, 2B, will be zero since no operations are performed during this mode. Minimum staffing levels for the other C-360 modes will not change.

The changes shown below are for a) TSR 2.1.1, Operational Modes, b) TSR 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, c) TSR 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and d) TSR Table 3.2.2-1, Minimum Staffing Levels. New wording is shown as underlined and deleted wording is shown as a strikethrough. 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.

a) TSR 2.1.1, Operational Modes, Mode 2:

Mode Number	Mode Name	Definition
2	<u>2A:</u> Autoclave Open or Out of Service	This mode is applicable when the autoclave is open and one or more of the following operations may be occurring: cylinder roll/tilt, parent cylinder pigtail connection or disconnection, inspections, testing, cylinder valve operation or autoclave repair. Autoclave is considered out of service when it is open with a cylinder in the autoclave and no operation is in progress.
	<u>2B:</u> <u>Out of Service</u>	<u>Autoclave is considered out of service when it is open with a cylinder in the autoclave and no operation is in progress.</u>

b) 2.1.4.13 CYLINDER HANDLING - CYLINDER ROLLING AND TILTING

LCO 2.1.4.13: UF₆ cylinders shall be disconnected from the UF₆ manifold during rolling and/or tilting.

APPLICABILITY: Modes: 2A-2

c) 2.1.4.14 CYLINDER HANDLING - CYLINDER DISCONNECTION

LCO 2.1.4.14: The cylinder valve shall be closed prior to disconnecting the cylinder from the pigtail.

APPLICABILITY: Modes: 2A-2, 6A

d) TSR Table 3.2.2-1, Minimum Staffing Requirements

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-360 ^b	1a	2	<u>In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.</u>
	1b, 3, 4, 5,	1 ^b	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	1a , <u>2A-2</u> , 6	12	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	7	12	At least one person in the laboratory. One person in the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
C-333-A ^b	1, 2, 5, 7	2	Two persons in the operating facility or immediately surrounding 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.

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

2) Reason for the Changes

The reason for this change is to allow reducing the minimum number of operators required at the C-360 facility during modes 2A, 2B, 6, and 7. This will allow safe efficient operation of the C-360 facility during these modes. USEC conducted a review of the Toll Transfer and Sampling facility (C-360) 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 C-360 modes can be reduced without adversely affecting safe operation of the facility. In addition, the review identified that the current C-360 Mode 2, Autoclave Open or Out of Service, is a combination of two separate operational modes. Autoclave Open is applicable when the autoclave is open and one or more operations may be occurring (cylinder roll/tilt, parent cylinder pigtail connection or disconnection, inspections, testing, cylinder valve operation or autoclave repair). Out of Service is applicable when the autoclave is open with a cylinder in the autoclave and no operation is in progress. It is

proposed that Mode 2 be split into Mode 2A, Autoclave Open, and Mode 2B, Out of Service. This will allow more flexibility in defining minimum staffing requirements for the C-360 modes of operation. Modes 1a, 2, 6, and 7 currently require a minimum staffing level of two. The proposed minimum staffing will be reduced to one for modes 6, 7, and the new mode 2A. The proposed minimum staffing requirements for the new Mode 2B is zero since no operations are performed during this mode. 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.

3) Justification of the 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.

As discussed in the Reasons for the Change above, the TSR minimum staffing requirements listed in Table 3.2.2-1 delineates the staffing requirements by Mode. All modes except Mode 2 are defined as a single condition and may include specific tasks that may be performed during that mode. The C-360 Mode 2 currently is defined as two separate operational sub-modes, Autoclave Open and Out of Service. Autoclave Open is applicable when the autoclave is open and one or more operations may be occurring (cylinder roll/tilt, parent cylinder pigtail connection or disconnection, inspections, testing, cylinder valve operation or autoclave repair). Out of Service is applicable when the autoclave is open with a cylinder in the autoclave and no operation is in progress. The proposed change will split mode 2 into separate modes, Mode 2A - Autoclave Open, and Mode 2B - Out of Service. This will allow each to have separate minimum staffing levels. TSRs 2.1.4.13, Cylinder Handling - Cylinder Rolling and Tilting, and 2.1.4.14, Cylinder Handling - Cylinder Disconnection, will be changed to be applicable to Mode 2A, but not Mode 2B. When an autoclave is in Mode 2B, Out of Service, these operations will not take place, thus the 2B mode is not applicable.

The changes in minimum staffing requirements for Modes 2A, 6, 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 personnel required for necessary and sufficient operator actions required by expectations and/or assumptions made in the accident analysis. The same type of evaluation supports the minimum staffing requirement of zero for the new Mode 2B. The proposed minimum staffing levels are consistent with the minimum number of operations staff required to safely operate the facility during normal and upset/accident conditions.

The evaluations of the applicable TSRs will include evaluation of the specific SAR accident analysis scenarios that credits the control delineated in the specific TSRs. The accident analysis and the credited control(s) have been evaluated for potential impact as the result of the proposed changes in minimum staffing levels. It should be noted that a number of the TSRs do not have a direct link to any of the existing accident analysis scenarios thus are not credited in the SAR accident analysis. These "legacy" TSRs are the result of the existing TSRs that were part of the original certification application TSRs before the NRC approved the Safety Analysis Report Upgrade (SARUP). During implementation of SARUP it was determined that melding the new SARUP TSRs into the existing application TSR was the

most efficient and cost effective process. As a result there are existing TSRs without a direct tie to the SAR Chapter 4 Accident Analysis. These TSRs are identified in the discussions that follow. Additional background historical information is available at the end of this enclosure in section 4) Safety Analysis Report Upgrade (SARUP) Historical Summary.

TSRs Without Specific Mode Applicability

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.

2.1.2.1 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, 165 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.

2.1.2.2 UF₆ CYLINDER TEMPERATURE (Safety Limit)

APPLICABILITY: Modes: All

A 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 2.1.3.1, Autoclave High Pressure Isolation System, and 2.1.3.3, Autoclave Steam Pressure Control System, neither of which are applicable to the operational modes for which minimum staffing changes are being requested.

The associated individual TSRs have specific Applicability modes and are discussed in more detail below.

2.1.4.18 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. Compliance with this administrative TSR is expected of all operators regardless of how many operators are present in C-360. Therefore, this TSR will be considered as not having any impact on minimum staffing requirements during any specific mode.

2.1.4.5 CRITICALITY ACCIDENT ALARM SYSTEM

2.1.4.5a: Detection Coverage

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

2.1.4.5b: 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.

TSRs With Specific Mode Applicability

The C-360 operating Modes 2A, 2B, 6, and 7 have proposed changes for their respective minimum staffing requirements. The remainder of the C-360 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 C-360 facility modes (including proposed modes) with proposed staffing changes provide the details of the evaluation for minimum staffing requirements:

Mode 2A - Autoclave Open - This mode is applicable when the autoclave is open and one or more of the following operations may be occurring: cylinder roll/tilt, parent cylinder pigtail connection or disconnection, inspections, testing, cylinder valve operation or autoclave repair.

NOTE: This new mode was originally part of Mode 2 (Autoclave Open or Out of Service), which included both the new Mode 2A - Autoclave Open and the new Mode 2B - Out of Service.

The following TSRs are specifically applicable to the new proposed Mode 2A:

2.1.4.13 CYLINDER HANDLING - CYLINDER ROLLING AND TILTING

APPLICABILITY: Modes: 2A

Rolling or tilting UF_6 cylinders while they are connected to a manifold could potentially result in pigtail damage. The pigtail could be damaged to the point that its integrity is not immediately breached, but its ability to provide UF_6 containment in the future could be significantly degraded.

This TSR is an administrative control and does not have any response requirements during upset/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. 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.

2.1.4.14 CYLINDER HANDLING - CYLINDER DISCONNECTION

APPLICABILITY: Modes: 2A, 6A

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

This TSR is an administrative control and does not have any response requirements during upset/accident conditions. Compliance with this TSR is expected of all operators regardless of how

many operators are present in C-360. 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.

As discussed above, all of the TSRs associated with mode 2A are administrative in nature and do not require operator response during potential upset/accident conditions. The accidents of concern that may result in a UF₆ release during this 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 4.3.2.2.10.1), and cylinder failure outside autoclave (4.3.2.2.15). Cylinder failure inside autoclave (4.3.2.2.13) is indirectly applicable since during mode 2A the administrative TSR 2.1.4.13 prevents cylinder rolling and tilting with the pigtail connected to the UF₆ manifold. The accident analysis does not credit any operator actions during these accident scenarios 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.

Mode 2B - 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.

NOTE: This new mode was originally part of Mode 2 (Autoclave Open or Out of Service), which included both the new Mode 2A - Autoclave Open and the new Mode 2B - Out of Service.

Since no operation is in progress by definition of the mode, there are no TSRs that are specifically applicable to this C-360 mode. Therefore, this TSR does not affect the proposed staffing requirement of zero for Mode 2B.

Mode 6 - Transfer Stations Operations - The following two modes describe operation of the transfer station:

Mode 6A - Preparation - This mode involves connection and disconnection of the receiving cylinder pigtail. The pigtail and transfer manifold shall be evacuated such that no liquid UF₆ is present in the piping.

Mode 6B - Transfer - This mode is applicable when liquid UF₆ is being transferred from a parent cylinder to another approved (the receiving) cylinder, and when liquid UF₆ exists in the transfer manifold and pigtail prior to evacuation. Sampling of the transferred liquid may occur simultaneously with the transfer operation.

The following TSRs are specifically applicable during Modes 6, 6A, or 6B:

2.1.4.1 UF₆ RELEASE DETECTION SYSTEM - LABORATORY (ZONE 1)
APPLICABILITY: Modes: 5, 6, 7

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" in the laboratory area and isolates the parent cylinder from the release point.

To ensure that automatic isolation is initiated the detectors are smoke tested with a known maximum concentration of smoke. The relationship of the test smoke to UF₆ out-leakage is also known with regard to particle size and mass concentration.

This TSR detects and initiates automatic isolation of the UF₆ release. 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 6, 6A, or 6B.

2.1.4.2a UF₆ RELEASE DETECTION SYSTEM - BASEMENT TRANSFER ROOM (A PORTION OF ZONE 4)

APPLICABILITY: Modes: 6B

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" in the basement transfer room and isolates the parent and receiving cylinders from the release point.

This TSR detects and initiates automatic isolation of the UF₆ release. 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 6, 6A, or 6B.

2.1.4.2b UF₆ RELEASE DETECTION SYSTEM - AUTOCLAVE HEATED HOUSINGS (ZONES 5-8)

APPLICABILITY: Modes: 5, 6, 7

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 sounds an alarm to alert operating personnel to initiate corrective/mitigative action.

This TSR detects and initiates an alarm to alert the operator of a potential UF₆ release. The operator is required to follow the instructions provided by the corresponding alarm response procedure. If a release is discovered then 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 in SAR Section 3.15.7.3. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 6, 6A, or 6B.

2.1.4.4 CYLINDER SCALE CART MOVEMENT PREVENTION SYSTEM

APPLICABILITY: Modes: 6B

This system provides protection against receiving cylinder pigtail failure and subsequent UF₆ release by prohibiting scale cart movement if the transfer manifold pressure indicates the potential presence of liquid UF₆ (pressure significantly above atmosphere) or inadequate pigtail purging and evacuation (pressure significantly below atmosphere).

This TSR prevents the movement of the cylinder scale cart by administratively controlling the key to the switch that allows application of air to the scale cart movement motor. The system does not require operator action during upset/accident conditions. Compliance with the TSR is expected regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 6B.

2.1.4.8 CYLINDER HEATING AND FILLING: CYLINDER PRE-HEAT AND PRE-FILL INSPECTION

APPLICABILITY: Modes: 5 and 6B

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/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 6B.

2.1.4.10 CYLINDER FILLING - PRE-FILL WEIGHT APPLICABILITY: Modes: 6A and 6B

Controls for nuclear criticality safety of cylinders containing material enriched to ≥ 1.0 wt % ^{235}U is in the form of moderation control by limiting the amount of potentially moderating material allowed to be present in the cylinder. Cylinders having an excess of 40 pounds of known moderating or unknown material are suspected of having a source of moderation. At 5.5 wt % ^{235}U over 50 pounds of water are required to initiate and sustain a nuclear criticality. In addition, the same materials that would cause a moderation/criticality concern would also cause a concern due to the vigorous reaction between UF_6 and the hydrogenous contaminant. Verification (by weighing) of the cylinder's contents prior to filling assures that moderating materials have not been inadvertently introduced.

This TSR is an administrative control and does not have any response requirements during upset/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Modes 6A and 6B.

2.1.4.11 CYLINDER FILLING - LIMITING NUMBER OF AUTOCLAVES VALVED TO THE TRANSFER STATION IN MODE 6B APPLICABILITY: Modes: 6B

When one autoclave is valved to the transfer station in mode 6B, the other autoclaves are not precluded from being open. However, the C-360 autoclaves share a common transfer header. This control gives assurance that when one autoclave is valved to the transfer station in mode 6B, the other autoclave tie-ins to the transfer header are blocked, preventing UF_6 release into those autoclaves.

This TSR is an administrative control and does not have any response requirements during upset/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 6B.

2.1.4.12 CYLINDER FILLING - CYLINDER FILL LIMIT APPLICABILITY: Modes: 6B

In the event a cylinder is overfilled during a transfer operation, the excess material can be removed from the cylinder safely by evacuating the cylinder to a low pressure. The hot liquid in the cylinder provides the thermal energy to vaporize UF_6 out of the cylinder to the evacuation low pressure source.

This TSR is an administrative control and does not have any response requirements during upset/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 6B.

2.1.4.14 CYLINDER HANDLING - CYLINDER DISCONNECTION APPLICABILITY: Modes: 2A, 6A

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/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 6A.

2.1.4.23 CYLINDER FILLING - TECHNETIUM TRAPS APPLICABILITY: Modes: 6B

The accident analysis for the C-360 transfer operations with the technetium traps in service assumes a maximum of one bank of traps is in service at any time. This limits the amount of liquid UF₆ at risk in the event of a transfer line break.

The accident analysis credits this in the Cylinder Failure Outside Autoclave scenario contained in SAR Section 4.3.2.2.10.1. This TSR is an administrative control and does not have any response requirements during upset/accident conditions. Compliance with this TSR is expected of all operators regardless of how many operators are present in C-360. Minimum staffing requirements are not impacted by this TSR. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 6B.

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 6, Transfer Station Operations, 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 and 4.3.2.2.10.1) 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 these accident scenarios 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 without adversely affecting the safety of C-360 operations during normal and upset/accident conditions.

Mode 7 – Sample - This mode is applicable when liquid UF₆ is being transferred from an autoclave-heated parent cylinder into another approved cylinder (the sample cylinder at the laboratory sample station). The mode starts when PL-*36 or PL-*37 is opened to bring liquid UF₆ into the sample cabinet.

The following TSRs are specifically applicable to Mode 7:

2.1.4.1 UF₆ RELEASE DETECTION SYSTEM – LABORATORY (ZONE 1) APPLICABILITY: Modes 5, 6, 7

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” in the laboratory area and isolates the parent cylinder from the release point.

This TSR detects and initiates automatic isolation of the UF₆ release. 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 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 7.

2.1.4.2b UF₆ RELEASE DETECTION SYSTEM – AUTOCLAVE HEATED HOUSINGS (ZONES 5-8)

APPLICABILITY: Modes: 5, 6, 7

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 sounds an alarm to alert operating personnel to initiate corrective/mitigative action.

This TSR detects and initiates an alarm to alert the operator of a potential UF₆ release. The operator is required to follow the instructions provided by the corresponding alarm response procedure. If a release is discovered then 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 in SAR Section 3.15.7.3. Therefore, this TSR does not affect the proposed minimum staffing requirement of one for Mode 7.

Mode 8 – Not In Use – Equipment (autoclaves, sampling cabinets, transfer station, scale cart, etc.) is not in use. No UF₆ is present.

There are no TSRs specifically applicable to Mode 8. There are no proposed changes to the minimum staffing (zero) for this mode.

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 7, Sample, 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 and 4.3.2.2.10.1) 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 these accident scenarios 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.

4) Safety Analysis Report Upgrade (SARUP) Historical Summary

During the planning for transition from Department of Energy (DOE) to NRC, a set of requirements were developed and codified in the Code of Federal Regulations (CFR) as 10 CFR 76, Certification of Gaseous Diffusion Plants. As delineated in 10 CFR 76.1, the purpose of 10 CFR 76 is as follows:

“This part establishes requirements that will govern the operation of those portions of the Portsmouth and Paducah Gaseous Diffusion Plants located in Piketon, Ohio, and Paducah, Kentucky, respectively, that are leased by the United States Enrichment Corporation. These requirements are promulgated to protect the public health and safety from radiological hazards and provide for the common defense and security. This part also establishes the certification process that will be used to ensure compliance with the established requirements.”

Section 76.35(b) of 10 CFR requires that the initial application for NRC certification include a Compliance Plan that met the following:

A plan prepared and approved by DOE for achieving compliance with respect to any areas of noncompliance with NRC's regulations that are identified by the Corporation as of the date of application that includes:

- (1) A description of the areas of noncompliance;
- (2) A plan of actions and schedules for achieving compliance; and
- (3) A justification for continued operation with adequate safety and safeguards.

The Compliance Plan was prepared and approved by DOE and submitted to the NRC by USEC. The plan contained issues addressing aspects of the operations at PGDP that were identified as not being in full compliance with either the applicable NRC requirements (10CFR76, etc.) or the commitments set forth in the USEC initial application for certification. Compliance Plan Issue 2, Update the Application Safety Analysis Report, identified deficiencies with 10 CFR 76.35(a)(4), (6), & (8) and 10 CFR 76.85. A description of the non-compliance follows.

The Safety Analysis Report (SAR) that was submitted to the NRC with the application for the initial certification of compliance was based, in part, on the DOE 1985 Final Safety Analysis Report (FSAR) and the approved safety evaluations performed by the plant since the issuance of the 1985 FSAR. The application SAR did not fully incorporate the information that was generated by the then ongoing DOE site-wide safety analysis report upgrade (SARUP) efforts. The 1985 FSAR had a number of areas, which needed to be updated with respect to the description of hazards, description of plant Structures, Systems, and Components (SSCs), human activities, and supporting safety analyses, including the following:

- (1) Assumptions used for the initiating events needed to be reevaluated;
- (2) The "as-exists" plant configuration did not match plant descriptions in the 1985 FSAR;
- (3) The expected response of SSCs to events may be different than previously assumed (e.g., response to seismic events); and
- (4) There are assumptions and differences in the accident scenarios and atmospheric dispersion models that could affect the releases and consequences calculated in the 1985 FSAR.

The initial Application SAR was based on the 1985 FSAR and needed to be revised. The upgraded DOE SAR contained new information including the development of supporting documentation for scenario identification, source term analysis, and consequence analysis. The DOE site-wide SARUP effort contained site characteristic information including geology, seismology, and meteorology (including tornado and high winds). Additionally, the facility and process descriptions required updating based on the final accident analyses resulting from the DOE site-wide SARUP effort, as well as other program upgrades such as the Configuration Management Program. The SAR update provided more accurate estimates of release rates and on site and off site consequences needed to meet 10 CFR 76.85 for establishing limiting conditions for operations.

The Compliance Plan Issue 2 also contained detailed action plans and schedules for achieving compliance with the identified deficiencies. In addition, a justification for continued operation was developed that provided assurance the plant had necessary and sufficient safety and safeguards. This included the actions to update the submitted Certification Application SAR, and subsequent actions to revise the TSRs as a result of the updated SAR.

On October 31, 1997, USEC submitted to the NRC an amendment to the Certification Application that included proposed modifications to update the Application SAR and TSRs to incorporate SARUP that satisfied the requirements of Compliance Plan Issue 2. The NRC accepted the amendment for review and Compliance Plan Issue 2 was closed.

On February 26, 1999, USEC submitted a plan to the NRC for modifying the Paducah and Portsmouth certificate amendment requests for updating the SARUP and completing responses to outstanding NRC questions on the SARUP submittals. The letter was the result of a February 12, 1999, meeting between the NRC and USEC where USEC presented the issues and proposed plan. The plan included changes to the SARUP amendment requests to: 1) Delete the TSRs that were included in the original SARUP submittals; 2) Revise SARUP support documents to adopt the (then) current TSRs that were included in Volume 4 of USECs Certification Application (USEC-01 and USEC-02); and 3) Change the existing Application TSRs for consistency with the safety basis established by the SARUP analysis. The changes to the Application TSRs included the addition of any new TSRs required by SARUP and revisions to current TSR sections and Basis statements that are necessary to reflect the SARUP results and conclusions. This process left many TSRs that were part of the original Application in Volume 4 that were not credited by the SARUP analysis that is now the SAR Chapter 4 Accident Analysis. The TSR Basis statements for these "legacy" TSRs do not contain a reference to the SAR Chapter 4 Accident Analysis but do contain a reference to SAR Section 3.15, Safety System Classification.

During the second half of 1999, USEC submitted the revised TSRs and SAR in accordance with the plan described in the February 26, 1999 letter. The revised SARUP SAR and TSRs were approved by the NRC letter dated February 11, 2002, and became effective February 28, 2002. The NRC approval letter included the Compliance Evaluation Report and the revised Certificate of Compliance. The "legacy" TSRs have remained in Volume 4 of the Application since they were approved.

**Enclosure 3
GDP 10-0042**

USEC-01

Certificate Amendment Request

Revise C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and Table 3.2.2-1, Minimum Staffing Requirements

Removal/Insertion Instructions

Certificate Amendment Request Paducah Gaseous Diffusion Plant Letter GDP 10-0042 Removal/Insertion Instructions	
Remove Pages	Insert Pages
APPLICATION FOR UNITED STATES NUCLEAR REGULATORY COMMISSION CERTIFICATION VOLUME 2	
SAR Section 4.3.2.2.10 4.3-95 SAR Section 4.3.2.2.13 4.3-110 SAR Section 6.5 6.5-3	SAR Section 4.3.2.2.10 4.3-95 SAR Section 4.3.2.13 4.3-110 SAR Section 6.5 6.5-3
APPLICATION FOR UNITED STATES NUCLEAR REGULATORY COMMISSION CERTIFICATION VOLUME 4	
TSR Section 2.1 2.1-2, 2.1-36, 2.1-37 TSR Section 3.0 3.0-4	TSR Section 2.1 2.1-2, 2.1-36, 2.1-37 TSR Section 3.0 3.0-4

The primary concern associated with this event is the loss of primary system integrity and the release of UF₆. The applicable EGs (see Table 4.2-2) associated with this event are EGs 1 and 2, as well as EG 6 in the EBE frequency range. No primary containment system exists for this type of event because the break is outside the autoclave. Therefore, EG 3 does not apply. The essential safety actions associated with meeting these EGs include (1) detection of the release, (2) isolation of the primary system to stop the release (where possible), and (3) emergency response to evacuate the immediate vicinity so that the exposure of on-site personnel is minimized.

Scenarios (i.e., causes, source-terms, mitigation) associated with this event vary slightly between the feed and toll transfer autoclaves. Each variation is addressed, and the most limiting event is presented for the purpose of analysis.

All autoclaves in the autoclave open or out of service mode— During the autoclave open mode, various pigtail connections, disconnections, and cylinder rolling operations could be performed. During out of service mode, the autoclave is open with a cylinder present but no operation in progress. During these operating modes, multiple operator errors or equipment malfunctions could occur that could result in a pigtail failure and release of UF₆. This event would result in significant consequences beyond the immediate vicinity only if the UF₆ is in the liquid/gaseous state. During these operating modes, there are no systems available that would isolate the cylinder should a failure of the pigtail occur at the cylinder connection. Therefore, the source-term for this event would be an unmitigated release of the contents of a cylinder. If the cylinder is in a position where the level of UF₆ is below the valve, the release would be in the vapor state. If the liquid level is above the valve, liquid UF₆ would exit the opening and flash to solid and vapor. The release of vapor only for this condition is bounded by the release at a transfer station in the toll transfer and sampling facility (see below) where the receiving cylinder is not isolated. Therefore, no additional analysis of this condition is provided. The liquid release is bounded by a cylinder failure event outside the autoclave as described in Section 4.3.2.2.15. Therefore, no additional analysis of this condition is provided. Consequently, no specific source-term and consequence analysis is provided for the autoclave open modes of operation.

Feed facilities — The C-333-A and C-337-A feed facilities UF₆ primary system lines outside the autoclave exit the autoclave shells and are routed in heated housings or are individually heated and insulated to the tie-line that enters the process buildings. Administrative controls in the feed facilities preclude moving a heavy load (up to the cranes' rating) over the C-337-A jet station barrier frame, or the heated housings, and common UF₆ primary systems piping between the autoclaves. This administrative control in conjunction with operator training minimizes the potential that operators will use the UF₆ cylinder handling cranes to move a heavy load over process piping in the feed facilities that is pressurized with UF₆. If an operator error or control failure results in a heavy load being inadvertently moved over this equipment, then an independent crane failure would be required before a heavy load drop event could result in a significant UF₆ release to the atmosphere. The design features of the cranes, UF₆ cylinder slings and lifting fixtures are controlled to minimize the potential for equipment failure. Due to these preventative design and administrative controls, it is not considered credible for heavy load drop event in the feed facilities to cause a primary system breach that results in a large UF₆ release.

A second potential line failure scenario in the feed facilities involves a heavy load impacting (i.e., running into) the C-337-A jet station piping. An administrative control precludes moving a heavy load (up to the cranes' rating) over the C-337-A jet station barrier frame. However, the most credible scenario for the

Based on the above essential controls, the resulting important to safety SSCs and TSRs are as follows:

- No SCCs were identified as important to safety as a result of this analysis.
- A TSR is provided that requires essential administrative controls be flowed into procedures.

4.3.2.2.13 Pigtail/line Failure Inside Autoclave (Primary System Integrity)

a. Scenario Description

During autoclave operations, several manipulations of the cylinder and pigtail connections are made to accomplish the required tasks associated with the heating, sampling, feed, and transfer of UF₆. These operations include such activities as rolling the cylinder, connecting and disconnecting pigtails, and purging and evacuating pigtails. All pigtail operations take place in the autoclave open mode of operation, which greatly reduces the potential frequency of this event. In addition, administrative controls are required to leak-test pigtails after each connection ensuring proper connections as well as only using inspected and approved pigtails. However, with multiple operator errors, it is postulated that a primary system failure could occur after the autoclave is closed. This event is an EBE because of the low probability that a primary system failure will be caused by a deficiency in the primary system or multiple operator errors during autoclave operations.

This event was evaluated and it was determined that the consequences could result in significant off-site and on-site impact if no mitigation is provided. These consequences are based on a liquid UF₆ release. Vapor releases would result in lower release rates and consequences.

The primary concern associated with this event is the loss of primary system integrity inside the autoclave and the release of liquid UF₆. The applicable EGs (see Table 4.2-2) associated with this event are all of the EGs

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 40 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 2.1 SPECIFIC TSRS FOR TOLL TRANSFER AND SAMPLING FACILITY (C-360)

2.1.1 OPERATIONAL MODES:

Mode Number	Mode Name	Definition
1a	Handling of Liquid Cylinders	This mode includes the movement of cylinders containing liquid UF ₆ and cylinder insertion into and removal from the autoclaves.
1b	Handling of Empty Cylinders and Cylinders Containing Solid UF ₆	This mode includes the movement of empty cylinders including removal from the autoclave and cylinders containing solid UF ₆
2	2A Autoclave Open	This mode is applicable when the autoclave is open and one or more of the following operations may be occurring: cylinder roll/tilt, parent cylinder pigtail connection or disconnection, inspections, testing, cylinder valve operation or autoclave repair.
	2B 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.
3	Containment	The autoclave is closed and at least one isolation valve on each autoclave penetration line is closed.
4	Autoclave Closed	This mode is applicable when the autoclave is closed and the steam supply is isolated. Both valves XV-*53 and FV-*05 are closed. Valve XV-*34 or FV-*00 is closed. Various valve operations may occur for alarm investigation, repair, etc.
5	Autoclave Heating	This mode is applicable when a UF ₆ cylinder is being heated inside a closed autoclave in preparation for removal of the UF ₆ . Various valve operations may occur in this mode for alarm investigation, jetting, cylinder burping, etc.

SECTION 2.1 SPECIFIC TSRS FOR TOLL TRANSFER AND SAMPLING FACILITY (C-360)

2.1.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.1.4.13 CYLINDER HANDLING - CYLINDER ROLLING AND TILTING

LCO 2.1.4.13: UF₆ cylinders shall be disconnected from the UF₆ manifold during rolling and/or tilting.

APPLICABILITY: Modes: 2A

ACTIONS:

Condition	Required Action	Completion Time
A. Cylinder rolled or tilted with the pigtail connected to the UF ₆ manifold.	A.1.1 Disconnect and discard the affected pigtail. <u>AND</u> A.1.2 Connect new pigtail.	Immediately.

SURVEILLANCE REQUIREMENTS: None.

BASIS:

Rolling or tilting UF₆ cylinders while they are connected to a manifold could potentially result in pigtail damage. The pigtail could be damaged to the point that its integrity is not immediately breached, but its ability to provide UF₆ containment in the future could be significantly degraded. [SAR Section 4.3.2.2.13]

SECTION 2.1 SPECIFIC TSRS FOR TOLL TRANSFER AND SAMPLING FACILITY (C-360)

2.1.4 GENERAL LIMITING CONDITIONS FOR OPERATION

2.1.4.14 CYLINDER HANDLING - CYLINDER DISCONNECTION

LCO 2.1.4.14: The cylinder valve shall be closed prior to disconnecting the cylinder from the pigtail.

APPLICABILITY: Modes: 2A, 6A

ACTIONS:

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

SURVEILLANCE REQUIREMENTS: None

BASIS:

Closing the cylinder valve prior to disconnecting the cylinder from the manifold prevents 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 outleakage.

The cylinder pressure indication channel used to establish cylinder pressure per Action A.1 is calibrated annually in SR 2.1.4.9-2.

SECTION 3.0 ADMINISTRATIVE CONTROLS
Table 3.2.2.1 Minimum Staffing Requirements^a

Facility Function	Mode/Operation	Staffing Requirements	Work Area Definition
C-300	All	3	PSS on the plant site with designee in C-300. Cascade Coordinator on plant site. Power Operator in C-300.
C-360 ^b	1a	2	In the facility or immediately surrounding grounds to include the guard station and the local cylinder yard.
	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.
C-333-A ^b	1, 2, 5, 7	2	Two persons in the operating facility or immediately surrounding grounds including the local cylinder yard.
C-337-A ^b	3, 4, 8	1	One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-310	Product withdrawal 1, 2, 3, 4 Cascade 1, 3	2 ^c	At least one person in the ACR. One person in the facility or immediately surrounding grounds including the local cylinder yard.
C-315	1, 2, 3, 4	2 ^c	Two persons in the facility or immediately surrounding grounds including the local cylinder yard.
C-331	Cascade 1, 2, 3	2	At least one person in the ACR.
C-335	F/S 1, 2, 3, 4, 5		
C-333	Cascade 1, 2, 3	3	At least one person in the ACR.
C-337	F/S 1, 2, 3, 4, 5		
Health Physics	At all times	1	Onsite.
Power Operations	At all times	4	Onsite.
Utilities Operations	At all times	4	Onsite.
Fire Services	At all times	4 ^d	Onsite ^d .
Security Services	At all times	4	Onsite.

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

b. Manning requirement is zero if 1) all C-333-A and 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 UFG 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.

**Enclosure 4
GDP 10-0042**

**USEC-01
Certificate Amendment Request
Revise C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder
Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection,
and Table 3.2.2-1, Minimum Staffing Requirements
Significance Determination**

Enclosure 4
GDP 10-0042

USEC-01
United States Enrichment Corporation (USEC)
Certificate Amendment Request

Revise SAR Section 6.5.1, Shift Operations, and C-360 Technical Safety Requirements (TSR) 2.1.1, Operations Modes, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, 2.1.4.14, Cylinder Handling – Cylinder Disconnection, and Table 3.2.1-1, 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 Change to Any Condition of the Approved Compliance Plan
All Compliance Plan Issues have been closed. As a result, the conditions specified in the compliance plan are no longer in effect. Thus, this proposed revision does not represent a significant change to any condition of the Approved Compliance Plan.
3. No Significant Increase in the Probability of Occurrence or Consequences of Previously Evaluated Accidents

The accidents of concern for the proposed change in the minimum staffing levels for C-360 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. None of the applicable accident scenarios require specific operator actions, except prerequisite administrative controls (inspections, precautions, etc.), for prevention of the event. These administrative controls 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 C-360.

The proposed change to split the current Mode 2, Autoclave Open or Out of Service into two separate modes, Mode 2A, Autoclave Open and Mode 2B, Out of Service will have no impact on the probability of an occurrence of an accident. 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.

Therefore, the proposed change will not significantly increase the probability of occurrence or consequences of previously evaluated accidents.

4. No New or Different Type of Accident

The proposed change does not affect the essential controls for any scenario in the accident analysis. The proposed change does not create any new failure modes or create initiating events that are different than previously evaluated in the SAR.

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

5. No Significant Reduction in Margins of Safety

The proposed changes to TSRs 2.1.1, 2.1.4.13, 2.1.4.14, and Table 3.2.2-1 will split the existing Mode 2, Autoclave Open or Out of Service, into two modes, Mode 2A, Autoclave Open and Mode 2B, Out of Service and will reduce the minimum staffing requirements for modes 6 and 7 which currently require two operators. The proposed minimum staffing will be reduced to one for modes 6, 7, and the new mode 2A. The proposed minimum staffing requirements for the new Mode 2B is zero since no operations are performed during this mode. 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 accident conditions.

Two TSRs, 2.1.4.13, Cylinder Handling – Cylinder Rolling and Tilting, and 2.1.4.14, Cylinder Handling – Cylinder Disconnection are being revised to change the applicability to reflect only Mode 2A, Autoclave Open. Previously these TSRs listed Mode 2, Autoclave Open or Out of Service. With the proposed change to split Mode 2 into Mode 2A, Autoclave Open and Mode 2B, Out of Service, there is no need to have the TSRs applicable during Mode 2B, Out of Service.

Neither of these 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.

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

The proposed changes to TSRs 2.1.1, 2.1.4.13, 2.1.4.14, and Table 3.2.2.1 do not impact or change any programs or plans in the certificate application.

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

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

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 3 and 4 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.

8. 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.

9. 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.

10. No Significant Construction Impact

These proposed changes will not require any construction. The proposed changes to TSRs 2.1.1, 2.1.4.13, 2.1.4.14, and 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.