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May 6, 1997

Dr. Carl J. Paperiello
Director, Office of Nuclear Material
Safety and Safeguards
Attention: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SERIAL: GDP 97-0041

Portsmouth Gaseous Diffusion Plant (PORTS)

Docket No. 70-7002

Certificate Amendment Request-Deletion of Seal Exhaust Pump Overflows in Buildings X-330 and X-333

Dear Dr. Paperiello:

In accordance with 10 CFR 76.45, the United States Enrichment Corporation (USEC or Corporation) hereby submits a request for amendment to the proposed certificate of compliance for the Portsmouth Gaseous Diffusion Plant. This certificate amendment request deletes Section 2.2.4.1, Seal Exhaust Pump Overflows, as a required design feature for Buildings X-330 and X-333. Updated analyses have shown that the overflows are not needed to prevent accidental criticalities associated with the accumulation of potentially uranium-laden oil in the seal exhaust pumps. These updated analyses were performed based on test data relating UF_4 and oil concentrations to provide maximum H/U ratios representing actual process conditions. Previous nuclear criticality safety (NCS) requirements were based on standard minimum critical volumes (with a safety factor incorporated) for different enrichments. These updated analyses resulted in calculated subcritical volumes that were greater than the minimum volumes previously used. In addition, capacity tests of the seal exhaust pump oil reservoirs have been performed to ensure that the maximum oil volume of the reservoir is less than the quantity required to support a criticality.

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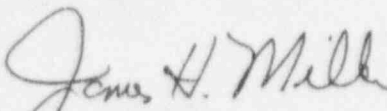
Dr. Carl J. Paperiello
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Enclosure 1 to this letter provides a detailed description and justification for the proposed changes. Enclosure 2 is a copy of the revised TSR and SAR pages. The TSR page is provided for your review and approval. The revised 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. These revised SAR pages reflect revisions associated with this certificate amendment request and may not reflect other changes to these SAR pages. Enclosure 3 contains the basis for USEC's determination that the proposed changes associated with this certificate amendment request are not significant.

This proposed certificate amendment request is required to allow installation of replacement seal exhaust pumps in the X-330 and X-333 facilities to support continued operation. As such, USEC requests this certificate amendment request receive the highest priority and that NRC review and approval of this certificate amendment request occur as soon as possible. The amendment should become effective no later than 15 days from issuance.

Any questions related to this subject should be directed to Mark Smith at (301) 564-3244.

Sincerely,

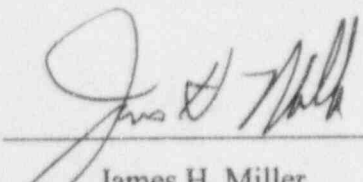

James H. Miller
Vice President, Production

Enclosures: As Stated

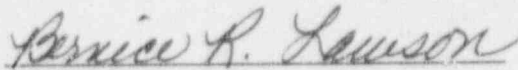
cc: NRC Region III Office
NRC Resident Inspector - PGDP
NRC Resident Inspector - PORTS
DOE Regulatory Oversight Manager

OATH AND AFFIRMATION

I, James H. Miller, swear and affirm that I am Vice President, Production, of the United States Enrichment Corporation (USEC), that I am authorized by USEC to sign and file with the Nuclear Regulatory Commission this Certificate Amendment Request for the Portsmouth Gaseous Diffusion Plant, 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.


James H. Miller

Subscribed to before me on this 6 day of May, 1997.



Notary Public
BERNICE R. LAWSON
NOTARY PUBLIC STATE OF MARYLAND
Certificate filed in Montgomery County
Commission Expires August 1, 1997

**United States Enrichment Corporation (USEC)
Proposed Certificate Amendment Request
Deletion of the Seal Exhaust Pump Overflows
in Buildings X-330 and X-333
Detailed Description of Change**

Specific TSR Section Affected

The proposed change would delete TSR Section 2.2.4.1, "Seal Exhaust Pump Overflows", as a required design feature in Buildings X-330 and X-333.

Reason for Change

Oil limiting overflows are no longer required by Nuclear Criticality Safety documentation. The proposed TSR change would permit the plant to replace currently installed seal exhaust pumps without the burden of installing oil limiting overflows which are no longer required.

Justification of the Change

The change will reflect the fact that oil level overflows are no longer required for Seal Exhaust Pumps in Cascade Seal Exhaust Stations located in the X-333 Building Area 1 and the X-330 Building Areas 2 and 3.

When the TSR was originally established, oil limiting overflows were determined to be necessary to prevent the potential buildup of an unsafe uranium mass in the seal exhaust pump oil by limiting the volume of oil available to contain uranium. Recently completed Nuclear Criticality Safety Evaluations/Approvals (NCSE/As) now show much larger volumes of oil are needed to support a criticality. These updated analyses were performed based on test data relating UF_4 and oil concentrations to provide maximum H/U ratios representing actual process conditions. Previous nuclear criticality safety (NCS) requirements were based on standard minimum critical volumes (with a safety factor incorporated) for different enrichments. These updated analyses resulted in calculated subcritical volumes that were greater than the minimum volumes previously used. In addition, capacity tests of the seal exhaust pump oil reservoirs have been performed to ensure that the maximum oil volume of the reservoir is less than the quantity required to support a criticality. In addition, Engineering tests discussed below, which involved verifying the actual oil capacity of the seal exhaust pumps by physically filling the oil reservoir, have shown the maximum volume of oil contained in the seal exhaust pumps is limited by the physical capacity of the pumps to quantities less than that needed for an accidental criticality to occur. Therefore, the physical capacity of the pumps is sufficiently small to ensure nuclear criticality safety is maintained, without dependence on oil limiting overflows.

The NCSE/A for the Area 1 Seal Exhaust and Wet Air Evacuation System, and the NCSE/A for Area 2 Seal Exhaust and Wet Air Evacuation System limit the volume of oil to 27 gallons. Pump capacity tests involving the KT-300c Kinney oil pump and the KD-300 Kinney oil pump indicate that the seal exhaust pumps in Areas 1 and 2 have volumes less than 27 gallons.

The NCSE/A for Area 3 Seal Exhaust and Wet Air Evacuation System limits the pump oil capacity to 9.2 gallons. Pump capacity tests involving Area 3 Stokes vacuum pump and Area 3 Kinney vacuum pump indicate that the installed pumps have volumes less than 9.2 gallons. In addition, this NCSE/A also evaluates use of the Kinney 50-cfm seal exhaust pump in Area 3. SAR Table 3.1.1.6-1 has been revised to reflect use of this pump in Area 3.

Based upon the new NCSE/As and the engineering capacity tests, the nuclear criticality safety control which required volume limiting oil overflows has been determined to be unnecessary. Therefore, Technical Safety Requirement 2.2.4.1 is no longer needed.

Proposed Certificate Amendment Request Portsmouth Gaseous Diffusion Plant Letter GDP⁰7-0041 Removal/Insertion Instructions	
Remove Pages	Insert Pages
VOLUME 1	
Section 3.1.1.6.1.1 Page 3.1-61/3.1-62 Table 3.1.1.6-1 Page 3.1-171/3.1-172	Section 3.1.1.6.1.1 Page 3.1-61/3.1-62 Table 3.1.1.6-1 Page 3.1-171/3.1-172
VOLUME 4	
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TSR 2.2.4.1 Page 2.2-33	TSR 2.2.4.1 Page 2.2-33

Seal exhaust systems in each area are not designed to be geometrically safe for moderation conditions at all possible enrichments. In order to maintain an always-safe condition, the amount of oil prescribed for these pumps is not to be exceeded. An oil overflow line is required for the seal exhaust pumps in Cascade Areas 4, 5, and 6. The seal exhaust pumps in X-333 Building and Cascade Area 2 shall have a maximum oil capacity less than or equal to 27 gallons. In Cascade Area 3 the seal exhaust pumps shall have a maximum oil capacity less than or equal to 9.2 gallons.

In case of area seal exhaust system failure, the following actions may be taken to maintain the affected system:

- Start up wet air pumps.

- Open boundary block valve and use adjacent area's seal exhaust station. (This does not apply to Area 1.) Also, Area 2 seal exhaust should not be used for Area 3.

- Return the seal exhaust gas to the cascade. (This would be a last resort because of the possibility of wet air being present in the seal exhaust gases and would result in barrier plugging).

The seal exhaust gases in the X-326, X-330, and X-333 are sampled prior to the alumina traps for PG negative as required by procedures, or as requested.

The atmospheric vents are also sampled. All seal exhaust and wet air discharge vents, except for LAW and ACR-3 wet air station, have a continuous monitoring sampler. These units are isokinetic, proportional flow samplers that collect the uranium isotopes, technetium, and fluoride content of the gas stream using alumina traps. The trap contents are analyzed periodically, thus providing emission data for environmental reporting and uranium accountability purposes.

3.1.1.6.1.2 Change-Out of Contaminated Alumina

The changeout of contaminated alumina is performed by Chemical Operations personnel when requested by Cascade Operations. Special precautions are required when handling alumina saturated with enriched uranium. The activated alumina, used in all seal exhaust and wet-air stations in the process buildings, is exposed to enriched UF_6 . Therefore, when this alumina becomes saturated and needs to be exchanged for fresh alumina, special precautions are required. The alumina is vacuumed from the geometrically safe trap into a geometrically safe can. These cans, when filled with alumina, are handled one at a time. While one can is in motion in an area, no other containers of uranium material should enter or be moved in the immediate area.

3.1.1.6.1.3 Handling of Oil from Seal Exhaust Pumps

Flushing and cleaning of the seal exhaust pumps is performed by Maintenance in accordance with plant procedures or as requested by Cascade Operations. Handling of the oils from Area 2 and above requires strict nuclear criticality control.

Oil, being a good moderating material, must be handled in a nuclearly safe manner when uranium may be present in it. It is possible that the oil in the seal exhaust pumps may contain high concentrations of uranium. Therefore, when oil is drained from the seal exhaust pumps, it is placed in 5-inch polybottles. The filled polybottles are stored upright in approved holders. Handling of oil from seal exhaust pumps is discussed in detail in Section 3.1.2, Purge Cascade.

3.1.1.6.2 Datum Systems

Because of the sensitivity of barrier and compressor performance to the cascade pressure level, it is desirable to maintain the operating pressures within ± 0.01 psi of a specified value. Pressures must therefore be sensed by instruments which have as their reference pressure either a full vacuum or a carefully controlled pressure. For low process pressures, the vacuum reference is adequate, since the range of the instrument will not have to be so large as to make it insensitive to pressure variations of the order of 0.01 psi. For most cascade pressure, however, it is necessary to supply a well-controlled datum pressure, which is fairly close to the pressure level being measured, to the instruments. Narrow-range differential pressure instruments, which have the needed sensitivity, are used.

The datum system consists of a volume of dry air, which can be fed and exhausted through pressure control instruments as required, to maintain a given pressure level controlled to ± 0.005 psi. A given datum system usually services a plant unit or half unit in the isotopic cascade; except in the purge cascades where the pressures within a cell taper too rapidly. Since all of the unit pressure transmitters and controllers are referenced to the same datum system, a shift in datum pressure will produce a movement of the cascade inventory within the unit. This technique can be used when inventory shifts or new operating conditions are desired.

3.1.1.6.2.1 High Datum

The high datum system is the primary pressure reference for stage control in cascade operations. Each unit has one or more high datum systems (see Figure 3.1.1.6-4). In the X-333 Process Building, the freezer/sublimers have their own high datum system, which can be used in place of the building system, for half a unit's cells.

A pressure blind transmitter (PBM 228) with an evacuated case, senses the high-datum system pressure and converts it to a 3 to 18 psi signal pressure, which is transmitted to a PIC. The PIC, in turn, controls a device called an Inverting Booster Relay. The IBR receives filtered dry instrument air which it balances with datum exhaust (datum vacuum system), to regulate the high-datum system pressure. To compensate for short-term fluctuations in pressure, a two-cubic-foot-capacity surge drum is installed in the system side of the IBR. From the surge drum the system is connected to the unit (X-330 and X-333) or half unit (X-326) high-datum headers through a pneumatic block valve.

The pneumatic block valve (CV 232) in the high datum system is part of an emergency system to protect the high datum systems in case of component failures. CV 232 is spring-loaded to close and requires air pressure to open. The valve is controlled by a three-way solenoid valve, which operates to vent the air from the pneumatic valve, allowing it to close.

TABLE 3.1.1.5-1 FLOWS AND PRESSURES IN INTERBUILDING PIPING AT 2260-MW POWER LEVEL

<u>LINE DESIGNATION</u>	<u>UF₆ FLOW RATE (lb-mole/hr.)</u>	<u>FEED AND WITHDRAWAL RATES (Kg U/Day)</u>	<u>UF₆ PRESSURES (psia)</u>	<u>TEMP (°F)</u>
A. 33-8 to 31-3	1547		2.3 to 18.0	210
B. 31-3 to 33-8	1547		(Range for A&B Lines)	210
A. 31-2 to 33-1	1480		2.1 to 19.0	210
B. 33-1 to 31-2	1480		(Range for A&B Lines)	210
A. 29-6 to 27-1	194		0.6 to 3.7	200
B. 27-1 to 29-6	194		(Range for A&B Lines)	200
Tails Withdrawal		25,201		
ERP/LAW		6,197		
Feed (Normal)		22,278		
(Paducah)		9,120		

TABLE 3.1.1.6-1 SEAL EXHAUST PUMP SIZES

	<u>NOMINAL</u>	MAXIMUM AMOUNT OF OIL	SIZE OF ALUMINA TRAP	AMOUNT OF ACTIVATED ALUMINA	SAFE ASSAY
AREA	SIZE OF PUMP	(gal)	(in)	(lb)	(%)
1	Kinney 300-cfm	27	24	165	3.0
	Wet Air Traps	-	24	165	3.0
LAW	Kinney 100-cfm	2.5	5	28	10
2	Kinney 300-cfm	27	10	75	5
3	Stokes 100-cfm	9.2	5	28	15
3	Kinney 50-cfm	9.2	5	28	15
4	Kinney 100-cfm	1.125	5	28	100
5	Kinney 100-cfm	1.125	5	28	100
6	Kinney 100-cfm	1.125	5	28	100

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TSR-PORTS
RAC 96X0090

PROPOSED

May 6, 1997

SECTION 2.2 SPECIFIC TSRs FOR X-330 AND X-333 FACILITIES

2.2.4 GENERAL DESIGN FEATURES

NONE

1

**United States Enrichment Corporation (USEC)
Proposed Certificate Amendment Request
Deletion of the Seal Exhaust Pump Overflows
in Buildings X-330 and X-333
Significance Determination**

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

1. No Significant Decrease in the Effectiveness of the Plant's Safety, Safeguards or Security Programs

The operational aspect of the seal exhaust pumps is not affected by this change. The amount of oil contained in the pumps for normal operation remains the same. The existence of a seal exhaust pump oil overflow is not addressed in plant safety, safeguards or security programs contained in Volume 3 of the Application for United States Nuclear Regulatory Commission Certification for the Portsmouth Gaseous Diffusion Plant. Therefore, the effectiveness of these programs is unaffected by this change.

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

There are no conditions to the Certificate of Compliance for Operation of Gaseous Diffusion Plants (GDP-2) related to the seal exhaust pumps. Thus, the proposed changes have no impact on any of the conditions to the Certificate of Compliance.

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

The seal exhaust pumps are not specifically addressed in any condition of the Compliance Plan. While there are a number of compliance plan issues related to nuclear criticality safety, none are affected by the NCSA's which support this change. There are no changes to any condition of the Compliance Plan associated with this change.

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

The operation of the seal exhaust pumps is not affected by the change of not requiring seal exhaust pump oil overflows. The maximum oil capacity of these pumps, as verified by engineering tests, is less than the limit required by the NCSE/As. Therefore, there is no increase in the probability of occurrence or consequences of any previously evaluated accidents.

**United States Enrichment Corporation (USEC)
Proposed Certificate Amendment Request
Deletion of the Seal Exhaust Pump Overflows
in Buildings X-330 and X-333
Significance Determination (continued)**

5. No New or Different Type of Accident

Operation of the seal exhaust pumps will not be affected by this change. The amount of oil contained in the pumps for operation has not changed. This change deletes the need for oil overflow lines which are not required as documented in NCSE/As. Therefore, there will be no new or different type of accident created by this change.

6. No Significant Reduction in Margins of Safety

The operation of the pumps will remain the same. Because the seal exhaust pump oil volume capacities prohibit the accumulation of a sufficient amount of oil to support a criticality, the safety margin is increased from that previously identified in the SAR and TSR.

7. No Significant Decrease in the Effectiveness of any Programs or Plans Contained in the Certificate Application

The seal exhaust pumps do not impact any programs or plans contained in the Certificate Application. This change will not impact the effectiveness of any program or plan contained in the application.

8. The Proposed Changes Do Not Result in Undue Risk to 1) Public Health and Safety, 2) Common Defense and Security, and 3) the Environment.

This change does not impact the operation of the seal exhaust pumps. The quantity of oil required to operate the seal exhaust pumps has not changed. Thus, any environmental impact associated with the seal exhaust pump oil has not been affected by the proposed change. This change has no impact on plant effluents or on the programs and plans in place to implement physical security. Consequently, this change does not result in undue risk to public health and safety, common defense and security, or the environment.

9. No Change in the Types or Significant Increase in the Amounts of Any Effluents that May be Released Offsite

This change does not impact the operation of the Seal Exhaust Pumps. The volume of oil required to operate the pumps remains unchanged. Thus, any environmental impact associated with the seal exhaust pump oil has not been affected by the proposed change.

**United States Enrichment Corporation (USEC)
Proposed Certificate Amendment Request
Deletion of the Seal Exhaust Pump Overflows
in Buildings X-330 and X-333
Significance Determination (continued)**

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

The operation of the seal exhaust pumps is not affected by this change. The maximum oil capacity of these pumps is less than the limit required by the NCSE/As. Consequently, there is no increase in the individual or cumulative occupational radiation exposure due to this change.

11. No Significant Construction Impact

This change does require any plant modifications and therefore does not have any construction impact.

12. No Significant Increase in the Potential for, or Radiological or Chemical Consequences from Previously Analyzed Accidents

The operation of the seal exhaust pumps is not affected by deletion of the requirement for seal exhaust pump oil overflows. The maximum oil capacity of these pumps is less than the limit required by the NCSE/As. Therefore, there is no increase in the potential for, or radiological or chemical consequences of, any previously analyzed accidents.