April 6, 2009

MEMORANDUM TO: Thomas G. Hiltz, Chief
Advanced Fuel Cycle, Enrichment,
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Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

FROM: Tilda Y. Liu, Senior Project Manager **/RA/**
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Office of Nuclear Material Safety
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SUBJECT: MARCH 12, 2009 TELEPHONE CONFERENCE SUMMARY ON TECHNICAL SAFETY REQUIREMENT CHANGE TO REVISE NORMETEX PUMP URANIUM HEXAFLUORIDE RELEASE DETECTION SYSTEM CONTROLS, PADUCAH GASEOUS DIFFUSION PLANT (TAC NO. L32477)

The U.S. Nuclear Regulatory Commission (NRC) staff and representatives of United States Enrichment Corporation (USEC), Paducah Gaseous Diffusion Plant (PGDP or certificate holder), held a telephone conference on March 12, 2009, to discuss the staff's draft requests for additional information (D-RAIs) concerning USEC-PGDP's proposed revision to its Technical Safety Requirement (TSR) Section 2.3.4.3 to extend the allowed completion time for restoring automatic uranium hexafluoride (UF_6) release detection and isolation system operability. The proposed change would provide new TSR controls to ensure that manual UF_6 release detection and isolation capability is available to support the extended allowed completion time.

The conference call was useful in clarifying the intent of the staff's D-RAIs. On the basis of the discussion, USEC-PGDP representatives were able to better understand the staff's questions. No staff decisions were made during the telephone conference, and USEC-PGDP agreed to provide information for clarification.

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Enclosure 1 provides a list of those who participated in the telephone conference. Enclosure 2 contains a listing of the D-RAIs that the staff provided to USEC-PGDP, via e-mail, on March 2, 2009, to facilitate the telephone discussion, as well as a status of the discussion resulted from the conclusion of the telephone conference.

USEC-PDGP has had an opportunity to review and comment on this summary.

Docket No.: 70-7001
Certificate No.: GDP-1

Enclosures: As stated

cc w/enclosures: Vernon Shanks, USEC-Paducah

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DATE	3/20/09		3/20/09		4/06/09	

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LIST OF PARTICIPANTS FOR TELEPHONE CONFERENCE TO DISCUSS

PADUCAH GASEOUS DIFFUSION PLANT

CERTIFICATE AMENDMENT REQUEST 08-0017

TECHNICAL SAFETY REQUIREMENT CHANGE TO REVISE NORMETEX PUMP URANIUM HEXAFLUORIDE RELEASE DETECTION SYSTEM CONTROLS

DRAFT REQUEST FOR ADDITIONAL INFORMATION

March 12, 2009

NAME	AFFILIATION
David Rahn	U.S. Nuclear Regulatory Commission (NRC)
Tilda Liu	NRC
Darren English	Paducah Gaseous Diffusion Plant (PGDP)
Mike Boren	PGDP
Matt Wilson	PGDP
Bill Kassebaum	PGDP
Tracy Henson	PGDP
Steve Poirier	PGDP
Calvin Pittman	PGDP

PADUCAH GASEOUS DIFFUSION PLANT

CERTIFICATE AMENDMENT REQUEST 08-0017

TECHNICAL SAFETY REQUIREMENT CHANGE TO REVISE NORMETEX PUMP URANIUM HEXAFLUORIDE RELEASE DETECTION SYSTEM CONTROLS

DRAFT REQUEST FOR ADDITIONAL INFORMATION

The bases for review of the proposed Technical Safety Requirement (TSR) are contained in *Title 10 of the Code of Federal Regulations* (10 CFR) 76.87 and 10 CFR 76.35. It is necessary for the NRC staff to evaluate whether the proposed TSR change for the Normetex Pump UF_6 Release Detection System Controls will provide adequate protection of the public health and safety, and that appropriate management controls and oversight will be provided to ensure that activities relevant to nuclear safety are conducted in an appropriately controlled manner that ensures protection of employee and public health and safety.

In order to complete this evaluation, the NRC staff will be requesting the following additional information. They are currently labeled as draft requests for information (D-RAIs). The staff will forward these questions, as appropriate, to Paducah Gaseous Diffusion Plant (PGDP) formally to obtain a response after conducting a conference call with PGDP to clarify these questions.

D-RAI 1

Provide a set of drawings, diagrams, or sketches depicting the location of the existing UF_6 detectors with respect to the Normetex pumps and piping system they are required to monitor, including approximate distances/dimensions from the likely sources of leakage to each of the detector ionization chambers designated for detecting those sources of leakage, and the orientation of the detectors, if sensitive to physical orientation. Such drawings, diagrams, or sketches should depict the identification numbers of each of the pumps and detectors.

D-RAI 2

Provide a description of the capability of the UF_6 detectors to detect the onset of UF_6 leakage from the areas of concern, including a discussion of the minimum detectable concentration of UF6 that can consistently be achieved, and how this minimum detectable concentration compares with or translates to concentrations of UF_6 predicted for the leakage rate analyzed in the accident analysis for the facility. Provide a description of the frequency at which the detectors are required to be tested to assure that the safety action will consistently take place before a safety limit is exceeded, and a discussion regarding how the concentration of test smoke used to perform this test was selected. Demonstrate how this test concentration is adequate to simulate the required response of these detectors when used to detect the minimum concentration levels of UF6 that are expected to occur to prevent the safety limit analyzed in the accident analysis from being exceeded.

D-RAI 3

Provide a description of how adjacent detectors which monitor the same pump are required to function together to provide a trip and isolation action to occur for that pump. Include a discussion regarding the responsiveness of this detection system to the onset of a leak, as well as the reliability to be gained by combining the output of multiple sensors.

D-RAI 4

Provide a set of drawings of the electrical interconnections between the detectors that are designated for detecting leakage from each pump or piping system being monitored, and the alarm and trip unit system that initiates the pump trip and isolation system, including sufficient information to make it clear which detector is assigned to monitor which pumps/piping system, and how they interact with the trip and isolation system. Provide a schematic drawing of the pump trip and isolation system, showing the automatic input to the isolation system from the UF_6 detection system and the manually- initiated input to the pump trip and isolation system, including any indications/alarms provided to the plant operators to respond to and take appropriate safety action to manually trip and isolate the system in the event of a detected leak, and to confirm that such action has been appropriately completed.

D-RAI 5

Provide a discussion as to which components and portions of this circuitry are shared or common among detection systems. Also, provide a description as to what are the challenges involved in troubleshooting and repairing this common component failure mechanism, and what is the basis for increasing the time allowed for completing such repairs/restoration to the automatic trip and isolation circuitry from one hour to 14 days (336 hours).

D-RAI 6

Notwithstanding the analysis in the Safety Analysis Report (SAR), the UF_6 detection system forms a part of the facility operational measures needed to assure that any radiological release is kept as low as reasonably achievable. In response to the plugged/blocked process line scenario described in the accident analysis, the UF_6 detection system is required to automatically detect an uncontrolled release of 4.83 pounds/second continuing for a maximum of 373 seconds during which time it is required to trigger a response of the trip and isolation system and complete the isolation of the leak prior to resulting in an offsite dose to persons at the boundary of the facility of 100 mRem. To accomplish this required safety action, portions of this 373 second time period are needed to accomplish the detection process which occurs from the onset of a leak to the time a valid signal is received and then confirmed by the detection system, the initiation or triggering process, the Normetex pump trip and coast-down process, and the valve isolation process. Provide an estimate of the approximate time periods needed by the automatic detection and actuation system, and by the mechanical equipment (pump and valve) performance needed to accomplish each of these functions so that the leakage may be terminated.

D-RAI 7

In the event that one or more detection heads and/or the automatic trip/isolation circuits become inoperable, what is the proposed test or surveillance that will be taken to ensure that the Area Control Room (ACR) manual emergency stop button is operable under Condition A and how will

such assurance be maintained continuously throughout the proposed completion time of 14 days?

D-RAI 8

Describe the process that is required to occur in the event that one or more detection heads and/or the automatic trip/isolation circuits become inoperable, a smoke watch is established to replace the function served by the inoperable detectors or automatic trip/isolation circuitry, and during this time an actual leak occurs. For example, from the onset of a leak, what process is used by the smoke watch personnel to discern whether a leak really exists, how he identifies exactly where it is occurring, and then how does he communicate this information to the personnel in the ACR to shutdown and isolate the pumps manually? What communications equipment is utilized by the smoke watch personnel to notify the ACR personnel of a leak that needs to be isolated? Specifically, approximately what is the maximum amount of time needed to identify that a leak is occurring, confirm which Normetex pump/bellows are affected, and communicate this fact to the attention of the ACR personnel? What is the maximum time needed by ACR personnel to confirm with smoke watch personnel the location of the leak, and then initiate manual trip of the pump and initiate closure of the isolation valve?

D-RAI 9

Describe the conditions that exist within the area where a smoke watch is required to be posted to accomplish the alternate detection capability for the proposed 14 day posting period. What are the ranges of ambient temperature and relative humidity in the area where the smoke watch is posted? How many personnel are required to be posted simultaneously to monitor each cell during a smoke watch of the affected areas? What is the continuous ambient noise level in the area where the smoke watch is posted, and from where the smoke watch personnel are required to contact personnel in the ACR that a leak is occurring? What process is utilized for assuring that the area being monitored by smoke watch personnel will be continually monitored as described in the proposed TSR change?

DISCUSSION/STATUS

During the conference call, PGDP indicated that the D-RAI questions were clear. However, upon further review of these D-RAIs and the information currently available on a number of certification documents, the staff took the initiative in revising these D-RAIs to better characterize the concerns. On March 18, 2009, the staff notified the affected PGDP representative that a revised RAI question will be sent to PGDP as formal RAI. The RAI is as follows:

RAI-1

Provide additional technical justification as to how the proposed administrative control (i.e., "smoke watch") for a period of up to 14 days provides adequate protection of employee and public health and safety. The certificate holder is requested to consider in its response the following:

a. a comparison of the effectiveness of each control (automatic and smoke watch), including the minimum detectable concentration of UF_6 which can be sensed by each method, along with its associated minimum detectable release rate, the maximum response time required to mitigate the hazard, from the onset of the release to the

ultimate termination of the release; and a discussion of how the minimum leak rate and concentration detectable by human means is considered adequate for meeting the facility certificate requirements;

b. additional information regarding the effectiveness of a smoke watch , as an adequate compensatory measure, when considering human factors (e.g., fatigue, attentiveness) and environmental conditions (e.g., heat, noise); and

c. a discussion of whether there is additional risk to plant workers or the public associated with “smoke watches,” and, if so, provide justification as to why the use of a smoke watch during the proposed time frame is still considered adequate for assuring the health and safety of plant workers and the public.