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USEC

June 16, 1997

U.S. Nuclear Regulatory Commission
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GDP-97-1013

Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001
Response to Inspection Report (IR) 70-7001/97-201 Notices of Violation (NOVs)

Nuclear Regulatory Commission (NRC) letter dated May 16, 1997, transmitted the subject IR that contained two NOVs involving: 1) the failure to provide a specific Nuclear Criticality Safety Evaluation for an ongoing plant operation; and 2) the failure to incorporate Nuclear Criticality Safety Approval (NCSA) requirements into the Pre-Fire Plan. The United States Enrichment Corporation's (USEC) response to these violations is provided in Enclosures 1 and 2, respectively. Enclosure 3 lists the commitments made in this report. Unless specifically noted, the corrective actions specified in each enclosure apply solely to PGDP.

In the cover letter transmitting the subject IR, NRC requested that USEC provide our "evaluation of the General Manager's Independent Assessment findings, their root causes, the planned corrective actions, and implementation schedule." As indicated in the IR[1], this assessment was conducted by USEC following an event that occurred on February 18, 1997, where USEC identified a failure to meet the double contingency principle for the C-400 Chemical Cleaning Facility "Cylinder Wash Operation." A related issue was also discovered with the C-400 Spray Booth Operation. As a result of these deficiencies, USEC voluntarily shut down both of these operations.

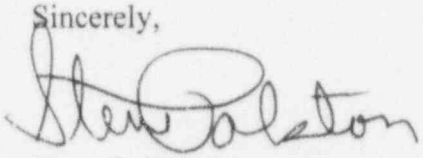
On February 28, 1997, NRC issued a Confirmatory Action Letter (CAL) to USEC, documenting the NRC's understanding of the actions USEC was taking concerning the C-400 cylinder wash and spray booth operations. One of the actions that was documented in this CAL was that USEC had committed to "perform an outside review of the NCS program focused on assessment of the independence and effectiveness of controls and their implementation prior to March 17, 1997." This assessment is the same assessment referred to in the cover letter for IR 97-201. As was noted in the CAL, USEC has completed this assessment. Subsequently, at a meeting at NRC Region III on May 2, 1997, USEC presented the results of the General Manager Independent

[1]See section 1.B, "General Manager's Independent Assessment," on page 5 of the IR.

Assessment to NRC Region III and NRC HQ representatives. Additionally, as required by the CAL, prior to restart of the C-400 cylinder wash and spray booth operations, USEC must notify NRC in writing of the completion of the corrective actions specified in the CAL. This would include a discussion of the results of the independent assessment along with the corrective actions taken or being taken to prevent recurrence of the events that led to the shutdown of the C-400 cylinder wash and spray booth operations. NRC is also tracking this issue as an Inspector Follow Item (i.e., 97-201-01). Therefore, USEC believes that based on the information already presented to NRC and the information required to be submitted in response to the CAL, that there is no further need to provide any further information to NRC in response to IR 97-201 concerning the General Manager's Independent Assessment findings.

If you have any questions regarding this submittal, please contact Bill Sykes at (502) 441-6796.

Sincerely,



Steve Polston
General Manager
Paducah Gaseous Diffusion Plant

SP:WES:LEA:mlg

Enclosures (3)

cc: NRC Region III
NRC Senior Resident Inspector,PGDP

UNITED STATES ENRICHMENT CORPORATION (USEC)
REPLY TO NOTICE OF VIOLATION (NOV) 70-7001/97-201-02

SAR Subsection 5.2.2.2, Nuclear Criticality Safety Responsibilities, requires, in part, that [NCS Engineers] are responsible for "verifying sufficient information is documented to allow independent analysis, verifying credible process upsets related to criticality safety are promptly identified and evaluated, verifying compliance with the double contingency principle, checking for accuracy, and verifying applicability of the calculational methods."

SAR Subsection 5.2.2.3, Process Evaluation and Approval, requires, in part, that "each operation involving uranium enriched to 1 wt% or higher of ^{235}U and 15 grams or more of U are identified and evaluated for NCS prior to initiation of the operation... The NCS evaluation process involved:...(4) identification of assumptions and equipment (i.e., physical controls) needed to ensure criticality safety."

Violation Cited

Contrary to the above, as of April 4, 1997, used NAM and Fixed HEPA filters containing uranium enriched to 1 wt% or higher of ^{235}U, and 15 grams or more of ^{235}U, stored in a 3 x 4 array in the C-335 building, were not covered by a documented NCS evaluation that identified the assumptions and physical controls needed to ensure criticality safety. Sufficient information was not documented to allow independent analysis.

I. Background Information

The storage of used NAM filters was analyzed in Nuclear Criticality Safety Evaluation (NCSE) KY/S-249 and controls were provided in Nuclear Criticality Safety Approval (NCSA) GEN-09. Control number four in NCSA GEN-09 defines a batch of NAM/Fixed HEPA filters with the statement "A batch of NAM/Fixed HEPA filters shall be defined as 4 used, potentially fissile, NAM/Fixed HEPA filters (of which no more than 2 can be roughing filters) which are not in a storage container." The NCSA also defines the spacing requirements for a batch of filters with the statement "Maintain a minimum 2-ft edge-to-edge spacing between batches of filters and between batches of filters and all other fissile/potentially fissile material with the following exception:

- No spacing is required between filters within a batch.
- During filter replacement spent filters may be temporarily stored next to the enclosure."

A posting for the NAM filter accumulation area in Building C-335 is also required in the NCSA. The revision page of KY/S-249 revision 5 (NCSE for GEN-09) includes the following: "...Added posting for filter accumulation area in C-335." Appropriate NCSA controls are also included in the NCSE.

The storage of NAM/HEPA filters at PGDP was considered to be bounded by the analysis of fissile waste drums stored in an array as described in NCSE KY/S-253. The waste drum analysis is bounding because the mass of uranium allowed in the batch of filters is approximately a third of the mass of uranium analyzed in the waste drums. Also, due to the geometry of the filters, the neutron leakage will be much higher than in the waste drums. The same spacing controls (2 ft edge-to-edge) are applied to the storage of both the batches of filters and the waste drums. Both mass and interaction parameters are controlled for the storage of the NAM/Fixed HEPA filters. Therefore, double contingency is being met for the storage of these filters.

II. Reasons for violation

The reason for the violation is the failure to provide sufficient detail in KY/S-249 to support the assertion that the NAM/Fixed HEPA filter storage array was bounded by the analysis in KY/S-253. The use of KY/S-253 (includes analysis of fissile waste drums stored in an array with 2-foot spacing) to bound similar storage operations at PGDP is an accepted plant practice. Administrative controls were not in place to ensure that documentation of NCS evaluations contain a sufficient level of detail for review by individuals unfamiliar with plant processes. Contrary to the NRC inspection report which indicates that NCS evaluated the array after NRC identification, no further analysis was performed since the NCS engineer that performed the original evaluation was able to verify that the used filter storage array analyzed was still representative of conditions in the plant.

III. Corrective Actions Taken and Results Achieved

The NCS manager held a meeting with NCS engineers to discuss the findings of the NRC inspection team following the exit meeting on April 4, 1997. The engineers were reminded to provide sufficiently detailed documentation of all operations associated with an NCSE in the future. This issue was documented in problem report PR-EN-97-1732 which was included in the Significant Condition Adverse to Quality (SCAQ) problem report PR-AD-97-1615. Problem report PR-AD-97-1615 reviewed a number of NCS issues and initiated corrective actions

designed to correct generic as well as specific problems. Those corrective actions directly associated with this violation are included in section IV (Corrective Actions to be Taken).

IV. Corrective Actions to be Taken

By August 20, 1997, NCS will update NCSE KY/S-249 to more clearly document the technical basis used to ensure the safe storage of spent NAM/Fixed HEPA filters. This update will include a sufficient level of detail to clearly justify the spacing requirements and other NCS controls used to ensure double contingency in the filter storage area.

By August 13, 1997, Procedure CP4-EG-NS1101 will be updated to require the NCS engineer performing an evaluation specify requirements for more explicit discussion of controls credited for ensuring double contingency and for the generation of a control matrix which identifies controls and safety systems required for the prevention of each accident scenario. This modification will ensure that a similar lack of detail will be prevented in future evaluations.

IV. Date of Full Compliance

NCSE KY/S-249 is currently being modified to include additional detail concerning the storage of used NAM filters to address the subject violation. This is an administrative change and has no impact on Nuclear Safety. The update is being included with system modifications and other operational changes currently being analyzed and will be complete on or before August 20, 1997. As stated above, the NCS manager has communicated the rigor required in NCS evaluations to prevent similar weaknesses in documentation. The corrective actions being taken to upgrade the NCS administrative procedure CP4-EG-NS1101 will be complete by August 13, 1997.

UNITED STATES ENRICHMENT CORPORATION (USEC)
REPLY TO NOTICE OF VIOLATION (NOV) 70-7001/97-201-03

SAR Subsection 5.2.2.2, Nuclear Criticality Safety Responsibilities, requires, in part, that [NCS Engineers] "verify NCSA commitments have been effectively flowed down into operating procedures."

SAR Subsection 5.2.2.3, Process Evaluation and Approval, requires, in part, that "first-line management is responsible for implementing the conditions delineated in the NCSAs through the use of such tools as training, operating procedures, posting, and labels...[and] for assuring the employees understand both the procedures and NCSA requirements before the work begins."

Violation Cited

Contrary to the above, as of April 14, 1997, The Pre-Fire plan did not contain the NCSA special fire fighting instructions for the NAM (Negative Air Monitor) filters stored In the C-335 Fissile Control Area (FCA) and emergency response training did not incorporate the special actions required at the FCAs.

I. Background Information

A review of the circumstances associated with this violation indicated that Fire Services personnel were unaware of the special fire fighting guidance provided by NCSA GEN-09. No documentation was found regarding flowdown of this guidance into plant procedures other than the sign found attached to the FCA boundary as noted in the inspection report details.

II. Reasons for violation

The reason for the violation is the failure of the NCS personnel to verify the flowdown of the NCSA GEN-09 requirements/guidance, required by Steps 4.6 and 6.5.1 of CP4-EG-NS1101, "Evaluation of Requests for Criticality Safety Approval," into specific fire fighting instructions in the Pre-Fire Plan and into the emergency response training.

III. Corrective Actions Taken and Results Achieved

The Pre-Fire Plan was revised to include the NCSA control specifying that fire-water may only be sprayed on the outside of the Negative Air [Machine] (NAM) filter storage box (B-25) on March 27, 1997. Immediate shift briefings were conducted to inform the Fire Services Personnel of the changes to the Pre-Fire Plan. Although not required to correct this problem, a copy of KY/1AB-99918C-PO2/10, "Use Of Water In Fire Fighting," was provided the Fire Services Manager for general information and use in the appropriate Pre-Fire Plans. This document provides guidance on evaluating the relative risks that must be considered prior to making the decision to use or not to use water delivered by fire hoses in fighting fires in areas storing Uranium material at up to 5% enrichment.

IV. Corrective Actions to be Taken

By August 13, 1997, Procedure CP4-EG-NS1101 will be revised as follows:

1. The procedure will be revised to provide more specific requirements for identifying affected organizations which need to review and approve Nuclear Criticality Safety Approvals.

2. The field verification checklist, Form CP-20933, "Verification Checklist For NCSA Implementation," used during the implementation of NCS approvals, will be revised to include a review of organizations affected by the limits to ensure responsibilities are clearly designated. Once all organizations have been identified, the NCS Engineer will ensure adequate flowdown of all NCS requirements during the field verification process.

3. The procedure will be revised to require the NCS Engineer to ensure that any fire fighting requirements present in the NCSA are incorporated into the Pre-Fire Plans, as appropriate.

V. Date of Full Compliance

Full compliance was achieved on March 27, 1997 when the corrective actions for the specific deficiency identified in NOV 97-201-03 were completed. The corrective actions being taken to prevent recurrence will be completed by August 13, 1997.

UNITED STATES ENRICHMENT CORPORATION (USEC)
LIST OF COMMITMENTS 70-7001/97-201

NOV 97-201-02

1) By August 20, 1997, NCS will update NCSE KY/S-249 to more clearly document the technical basis used to ensure the safe storage of spent NAM/Fixed HEPA filters. This update will include a sufficient level of detail to clearly justify the spacing requirements and other NCS controls used to ensure double contingency in the filter storage area.

2) By August 13, 1997, Procedure CP4-EG-NS1101 will be updated to require the NCS engineer performing an evaluation specify requirements for more explicit discussion of controls credited for ensuring double contingency and for the generation of a control matrix which identifies controls and safety systems required for the prevention of each accident scenario. This modification will ensure that a similar lack of detail will be prevented in future evaluations.

NOV 97-201-03

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The procedure will be revised to provide more specific requirements for identifying affected organizations which need to review and approve Nuclear Criticality Safety Approvals.

The field verification checklist, Form CP-20933, "Verification Checklist For NCSA Implementation," used during the implementation of NCS approvals, will be revised to include a review of organizations affected by the limits to ensure responsibilities are clearly designated. Once all organizations have been identified, the NCS Engineer will ensure adequate flowdown of all NCS requirements during the field verification process.

The procedure will be revised to require the NCS Engineer to ensure that any fire fighting requirements present in the NCSA are incorporated into the Pre-Fire Plans, as appropriate.