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February 23, 1998
GDP 98-0025

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

Paducah Gaseous Diffusion Plant (PGDP)
Docket No. 70-7001
Safety Analysis Report Update - Modifications to Control Logic for C-360 Autoclave High Pressure Isolation System

Dear Dr. Paperiello:

By letter dated October 31, 1997 (see the Reference), USEC submitted a certificate amendment request containing the Safety Analysis Report Update (SARUP) required by Issue 2 of DOE/ORO-2026, "Plan for Achieving Compliance with NRC Regulations at the Paducah Gaseous Diffusion Plant" (the Compliance Plan) for NRC review and approval. USEC's October 31, 1997 letter contained the following commitment:

The autoclave high pressure isolation system used in the toll transfer and sampling C-360 facility is equipped with a containment reset switch. The DOE SAR Upgrade identified that that existing control logic for this reset switch circuit could result in inadvertant opening of the containment valves as well as preventing closure of the containment valves if the switch is not in the correct position. The control logic for the C-360 autoclave high pressure isolation system reset switch will be modified such that upon reset of the containment signal, the valves will remain closed. Additionally, the control logic will allow the valves to be opened by subsequent operator action. A similar modification was performed for the feed facility autoclaves in accordance with Item 2 of the Plan of Action and Schedule for Compliance Plan Issue 3. The results of an engineering evaluation of the control logic, a schedule for implementing recommended modifications, and any necessary changes to the SARUP will be submitted to the NRC by February 23, 1998.

In accordance with this commitment, an engineering evaluation of the autoclave containment control logic for C-360 has been performed. The results of that evaluation are summarized in Enclosure 1. Based on the results of the engineering evaluation, modifications to resolve the SARUP-identified

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deficiencies in the C-230 autoclave containment reset logic will be implemented by March 31, 2000.

Any questions regarding this matter should be directed to Mr. Steve Routh at (301) 564-3251 or myself at (301) 564-3250. Commitments contained in this submittal are identified in Enclosure 2.

Sincerely,

S. D. Routh for

Steven A. Toelle
Nuclear Regulatory Assurance and Policy Manager

Reference: Letter from James H. Miller (USEC) to Dr. Carl J. Paperiello (NRC), "Certificate Amendment Request - Update the Application Safety Analysis Report," Paducah Gaseous Diffusion Plant, Letter No. GDP 97-0188, October 31, 1997.

Enclosures. 1. Evaluation of C-360 Autoclave Containment Control Logic
2. Commitments Contained in this Submittal

cc: Mr. Robert C. Pierson, NRC-HQ
NRC Region III Office
NRC Resident Inspector - PGDP
NRC Resident Inspector - PORTS

**Evaluation of
C-360 Autoclave Containment Control Logic**

SARUP Commitment

Item 12 of Table 1 of USEC Letter GDP 97-0188 dated October 31, 1998 states:

Control Logic for C-360 Autoclave High Pressure Isolation System

The autoclave high pressure isolation system used in the toll transfer and sampling C-360 facility is equipped with a containment reset switch. The DOE SAR Upgrade identified that the existing control logic for this reset switch circuit could result in inadvertent opening of the containment valves as well as preventing closure of the containment valves if the switch is not in the correct position. The control logic for the C-360 autoclave high pressure isolation system reset switch will be modified such that upon reset of the containment signal, the valves will remain closed. Additionally, the control logic will allow the valves to be opened by subsequent operator action. A similar modification was performed for the feed facility autoclaves in accordance with Item 2 of the Plan of Action and Schedule for Compliance Plan Issue 3. The results of an engineering evaluation of the control logic, a schedule for implementing recommended modifications, and any necessary changes to the SARUP will be submitted to the NRC by February 23, 1998.

Results of Engineering Evaluation

Engineering drawings E5E-14443-0027 and E5E-15781-02 were reviewed to examine the electrical schematics of the control logic of the containment reset switch. The review verified that if the reset keyswitch could be held or maintained in the reset position, then the initiating devices (i.e., high pressure or high-high conductivity) would be blocked from closing the containment valves. Additionally, after a containment isolation event, the reset keyswitch would override the initiating devices and allow the valves to be opened by separate operator action.

Field investigation determined that the keyswitch could be maintained in the reset position but that the key was held, i.e., could not be removed from the keyswitch. It was determined during the field investigation that the Autoclave Containment Reset Key is kept in the Supervisor's office and that it is accepted practice for the building supervisor alone to reset autoclave containment and immediately return the key to the keybox in the supervisor's office. However, subsequent review of procedures CP4-CO-CN2051a, CP4-CO-AR8360, and CP4-CO-ON3039 determined that key control of this key is not proceduralized and that operator/supervisor actions for reset of autoclave containment are not proceduralized either.

Additional review of the drawings determined that the control logic of the autoclave containment valves was already modified to maintain valves in the closed position after containment reset until

separate operator action is taken to open each valve. This work was performed in Phase 1 of Class I Logic Modifications (SRD parts A, E, and G), which was completed in February 1996. Further review of the control logic drawings determined that rewiring the reset keyswitch to not override any of the initiating devices would correct the logic and obviate any need to replace the keyswitch device.

Deficiencies identified include allowance of inadvertent opening of containment valves, prevention of valve closure if reset switch is not in the correct position, and automatic re-opening of valves upon containment reset.

The conclusions of the engineering evaluation are that the autoclave containment reset logic should be modified to correct the deficiency identified in the SARUP submittal which was not addressed in the previous design effort of ESO Z92880, *Class I Logic Modifications, Phase 1 (SRD parts A, E & G)*, completed February 1996. It is recommended that the existing reset logic of the autoclave containment systems in C-360 be modified to prevent autoclave containment reset until all initiating devices are restored to their non-alarm state. It is also recommended that appropriate procedures be modified to implement the correct level of key control for the autoclave containment reset key as an interim measure until the modification is complete. Modification of the wiring to correct the logic precludes any need to change the keyswitch device.

Schedule

The following actions will be taken based on the results of the engineering evaluation of the C-360 autoclave containment reset logic:

1. The appropriate procedures to implement the correct level of key control for the autoclave containment reset key will be revised by May 31, 1998.
2. The recommended modifications to the autoclave containment reset logic for C-360 will be completed by March 31, 2000. Upon completion of the modifications, Section 3.15.5.1.3 of the SARUP will be revised to read as follows:

Qualitative fault tree analysis. In addition to the safety function analysis, a fault tree analysis was performed in accordance with Section 4.3.1.1.3. The fault tree analysis concluded that the system can meet the functional requirements previously described. Additionally, two one areas of system configuration have has been identified for corrective action.

The autoclave containment reset switch operates similar to the switch for the feed facilities and could result in inadvertent opening of containment valves as well as preventing closure if the switch is not in the correct position.

Commitments Contained in this Submittal

1. The appropriate procedures to implement the correct level of key control for the autoclave containment reset key will be revised by May 31, 1998.
2. The recommended modifications to the autoclave containment reset logic for C-360 will be completed by March 31, 2000. Upon completion of the modifications, Section 3.15.5.1.3 of the SARUP will be revised to read as follows:

Qualitative fault tree analysis. In addition to the safety function analysis, a fault tree analysis was performed in accordance with Section 4.3.1.1.3. The fault tree analysis concluded that the system can meet the functional requirements previously described. Additionally, two one areas of system configuration have has been identified for corrective action.

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