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Enrichment Corporation

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GDP 97-2004

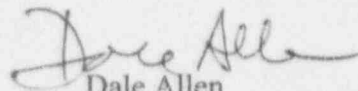
United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Portsmouth Gaseous Diffusion Plant (PORTS) - Docket No. 70-7002 - Event Report 97-04

Pursuant to Safety Analysis Report (SAR), Section 6.9, Table 6.9-1, J (2), Enclosure 1 provides the required 30 day written Event Report (ER) for an event involving a high condensate level shutoff actuation at the Portsmouth Gaseous Diffusion Plant. Enclosure 2 is a list of commitments made in the report.

Should you require additional information regarding this event, please contact Scott Scholl at (614) 897-2373.

Sincerely,



Dale Allen
General Manager
Portsmouth Gaseous Diffusion Plant

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DIA:Scholl:mc

Enclosures

cc: C. Cox/D. Hartland, NRC Resident Inspectors



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Description of Event

On April 8, 1997, at 1454 hours, X-344 Autoclave (AC) #3 was in Mode IV transferring a 48 inch Uranium Hexafluoride (UF_6) cylinder to a daughter cylinder when the audible alarm for steam shutdown was received. Operators responding to the alarm found that the light for the "A" condensate level probe had alarmed and cleared, indicating the high condensate level shutoff (HCLS) safety system had actuated. Steam supply block valve FSV-163 was verified to be in the closed position, stopping flow to the autoclave as designed. A HCLS actuation is reportable in accordance with the Safety Analysis Report (SAR), Table 6.9-1, J (2).

The Plant Shift Superintendent (PSS) and the X-344 building Front Line Manager initially believed that the actuation of condensate level probe "A" was a false actuation resulting from a defective probe. Based on past operating experience, a condition where only one of two probes actuate is normally associated with a defective probe. Immediately following the actuation, operations personnel opened the condensate drain line and autoclave to determine if a restriction in the condensate line had caused water to back up. A small amount of water was drained from the condensate line but it was believed to be an insufficient amount to cause the probe to actuate. Based on this information, the PSS declared condensate level probe "A" inoperable and Mode IV operation was continued in accordance with Technical Safety Requirement (TSR) 2.1.3.7.

After transfer operations were completed and the autoclave was shutdown, Maintenance checked the operation of both condensate level probes. Both probes were found to be working properly. The condensate drain in-line strainer was also inspected and found to be restricted with debris. Since a restricted strainer is a condition that the condensate level probes are designed to detect, the actuation was determined to be a reportable event and notification to the NRC was made.

The condensate level shutoff system is provided to prevent over pressurization or a nuclear criticality in an autoclave following a postulated UF_6 release. Excess water is undesirable in the event of a UF_6 release from the cylinder that could cause either high Hydrogen Fluoride pressure as the result of the reaction between UF_6 and water or the excessive moderation of an unsafe mass of uranium thereby causing a criticality within the autoclave. The system function is to detect either a drain line plug or restriction and to shutoff the steam flow to the autoclave.

Cause of Event

The direct cause of the HCLS safety system actuation was due to debris accumulation in the condensate strainer. Maintenance inspected the in-line strainer and discovered a large amount of debris.

The root cause of the event was the frequency of the in-line strainer clean out was not often

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enough to prevent debris from accumulating in the autoclave in-line strainer. Previous HCLS actuations caused by restricted in-line strainers resulted in the implementation of an interior shell cleaning program on autoclaves. Interior shell cleaning was considered as a way to reduce the likelihood that the condensate in-line strainers would become restricted due to accumulated debris.

The Autoclave #3 in-line strainer was last cleaned on March 11, 1997. The debris accumulated in the in-line strainer in approximately one month of operation. The autoclave interior shell was cleaned out twice during that period. Debris comes from flaked off rust and paint originating from steel UF₆ cylinders and the autoclave interior. The current practice has been to check and clean out the in-line strainers on the condensate lines every six months.

Following the discovery of the AC #3 restricted strainer, the X-344 AC #2 and AC #3 strainers were inspected for debris. A small amount of rust was found in the AC #2 strainer. The strainer had been cleaned 38 days earlier. No debris was found in the AC #4 strainer, which had been cleaned 21 days earlier. The AC #1 strainer was not inspected because the autoclave had not been in service since the last strainer cleaning on March 24, 1997.

All 13 autoclaves have in-line condensate strainers that are used to prevent the debris from accumulating in the downstream steam trap. The four autoclaves in the X-344 building have one inch diameter condensate drain lines. This differs from the two inch drain lines that are incorporated into the other autoclaves. The condensate strainers in the one inch drain lines have a smaller surface area than the two inch lines. As a result the smaller lines can become restricted more rapidly than the larger lines.

This event also identified the need to improve guidance to operations personnel regarding actions that should be taken following a HCLS actuation. The actions taken following this event did not detect that the strainer was restricted with debris. It appears from this event that water may have briefly contacted the condensate level probe "A" causing it to actuate. Although it is not known for certain that a high water level did exist, there may be small differences in the probe position or response time that could have caused only one probe to actuate in this event. A more thorough inspection of the condensate system following a HCLS actuation would provide greater assurance that the condensate line is not restricted.

Corrective Actions

1. On April 9, 1997, the AC #3 in-line strainer was cleaned to remove accumulated debris.

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2. An engineering evaluation of the condensate strainer design will be performed to determine if the strainer mesh size and/or surface area can be adjusted to reduce the rate of strainer plugging. A corrective action plan based on the results of this evaluation will be developed by June 6, 1997.
3. By May 30, 1997, monthly condensate in-line strainer cleaning for the X-344 building autoclaves will be included on the PM Master portion of the Computer Maintenance Management System (CMMS). The frequency may be adjusted depending on the amount of debris accumulation that is found during the monthly inspection. This action will be limited to the X-344 autoclaves because of their smaller strainer size.
4. By June 6, 1997, Engineering will provide additional guidance to operations personnel on what actions to take following a HCLS actuation.
5. By July 14, 1997, additional guidance regarding actions to take following HCLS actuation will be incorporated into operating procedures.
6. Additional cleaning of X-344 Autoclaves #1, #2, #3 and #4 condensate in-line strainers was completed on May 9, 1997.

Extent of Exposure of Individuals to Radiation or Radioactive Materials

There were no exposures to individuals from this incident to radiation or radioactive materials.

Lessons Learned

Past autoclave operational experience has contributed to a belief by operations personnel that a single condensate probe actuation is normally a false actuation. This belief could cause personnel to adopt non-conservative decision making. A single condensate probe actuation should be considered valid until factual evidence proves otherwise.

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Enclosure 2

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List of Commitments

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