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United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

GDP-97-2034

Portsmouth Gaseous Diffusion Plant (PORTS) - Docket No. 70-7002 - Event Report 97-21

Pursuant to 10 CFR 76.120 (d) (2), Enclosure 1 provides the required 30 day written Event Report (ER) for an event involving a failure of the UF₆ Cylinder High Pressure Autoclave Steam Shutoff safety system at the Portsmouth Gaseous Diffusion Plant. Investigation activities are continuing to determine the root cause and corrective actions for this event. This report will be revised following completion of these activities. The revised report is scheduled for February 14, 1998. There are no new commitments contained in the report.

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

Sincerely,

Jim Morgan
Acting General Manager
Portsmouth Gaseous Diffusion Plant

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cc:
NRC Region III
D. Hartland, NRC Resident Inspector, PORTS

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Event Report 97-21

Description of Event

On October 22, 1997, at 0635 hours, X-343 Autoclave (AC) #7 was in Mode II, heating a 14-ton Uranium Hexafluoride (UF₆) Tails cylinder when the audible alarm for steam shutdown was received. The cylinder had been heating for approximately one hour when the actuation occurred. The Operator responding to the alarm noticed the Low Cylinder Pressure Shutoff (LCPS) safety system had actuated, causing the steam supply valves to AC #7 to close. The operator also noted that PI-705A indicated an internal UF₆ cylinder pressure of -50 psia. The LCPS is designed to actuate if the internal cylinder pressure has not reached 20 psia after one hour of heating. Since a reading of -50 psia indicated the instrument had malfunctioned, the operator opened the local instrument cabinet to investigate the failure. When the door to the cabinet was opened, the door movement caused the instrument reading to change to 61.7 psia, which was the expected cylinder pressure. The steam supply valves to the autoclave then opened and cylinder heating resumed automatically as designed. The operator immediately initiated steam shutdown utilizing the local steam isolation controls to place the autoclave in a shutdown condition until the cause of the actuation could be determined.

The initial engineering review of the actuation concluded that the LCPS actuation was caused by an invalid low pressure signal and was not reportable. Further investigation into the cause of the failure of PI-705A revealed that the pressure transducer providing the signal to PI-705A had failed. Engineering determined that the failed pressure transducer also rendered the UF₆ Cylinder High Pressure Autoclave Steam Shutoff (CHPASS) safety system inoperable, since the pressure transducer also provides the signal for this safety system. Following the discovery of this information, it was determined that the failure of the AC #7 CHPASS safety system was reportable in accordance with 10 CFR 76.120 (c) (2). The event notification was made on October 24, 1997, at 1735 hours. The pressure transducer is a 24-VDC instrument, manufactured by Moore Industries, model number PIT/3-15PSIG/4-20MA/12-42DC.

The CHPASS system is a single channel system. The heating of a UF₆ cylinder containing an excessive amount of 'light' gases at normal heating temperatures could result in the internal cylinder pressure exceeding the hydrostatic test pressure and possibly create a UF₆ release in the autoclave. The safety system function of the CHPASS ensures the pressure in the cylinder does not exceed the maximum allowable working pressure of the lowest rated cylinder that could be heated in the autoclave. The UF₆ cylinder pressure instrument loop is required to alarm if the cylinder pressure at any time reaches 115 psia with a tolerance of + 5 psia.

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Cause of Event

The direct cause of the event was a failed pressure transducer. The pressure transducer converts a pneumatic signal of 3-15 psia to a current signal of 4-20 mA. Since the loop is wired in series, when the 4-20 mA current from the pressure transducer is lost, it renders the loop inoperable.

The root cause of the failed pressure transducer has not been determined. Engineering will perform a failure analysis and root cause determination of the failed pressure transducer. This event report will be revised when the root cause and corrective actions have been determined. A revised report is scheduled for February 14, 1998.

Corrective Actions

1. On October 28, 1997, the pressure transducer was replaced and the loop calibrated.

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

Lessons learned will be provided with the revised event report.