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September 11, 1998



Energy to Serve Your World™

Docket No.: 50-348

10 CFR 50.73

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Joseph M. Farley Nuclear Plant - Unit 1
Licensee Event Report No. 98-003-00
Waste Gas Decay Tank Hydrogen and Oxygen Exceeded Concentration Limits

Ladies and Gentlemen:

Joseph M. Farley Nuclear Plant - Unit 1 Licensee Event Report No. 98-003-00 is being submitted in accordance with 10 CFR 50.73(a)(2)(i). There are no NRC commitments in the Licensee Event Report.

If you have any questions, please advise.

Respectfully submitted,

Dave Morey

EWC/maf wgasd.doc

Enclosure

cc: Mr. L. A. Reyes, Region II Administrator
Mr. J. I. Zimmerman, NRR Project Manager
Mr. T. P. Johnson, Plant Sr. Resident Inspector

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Joseph M. Farley Nuclear Plant - Unit 1		DOCKET NUMBER (2) 0 5 0 0 0 3 4 8	PAGE (3) 1 OF 4
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TITLE (4)
Waste Gas Decay Tank Hydrogen and Oxygen Exceeded Concentration Limits

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME		
0	8	1989	8	003	00	0	9	1989			

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)																					
POWER LEVEL (10) 1 0 0	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input checked="" type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)	<input type="checkbox"/> 73.71	<input type="checkbox"/> OTHER Specify in Abstract below or in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME L. M. Stinson, General Manager - Nuclear Plant	TELEPHONE NUMBER AREA CODE: 3 3 4 8 9 9 - 5 1 5 6
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX										
D	W	E		R	E	W		1	2	0	N								

SUPPLEMENTAL REPORT EXPECTED (14)

YES (if yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

ABSTRACT

On August 16, 1998 at 0930, with Unit 1 in Mode 1 at 100% power, it was determined that Unit 1 had been operated in a condition prohibited by Technical Specifications (TS). TS 3.11.2.5 action statement b., requires that oxygen (O₂) concentration be reduced to less than or equal to 4% within one hour and less than or equal to 2% within 48 hours when Waste Gas System (WGS) hydrogen (H₂) concentration is greater than 4%. In preparation for Unit 1 shutdown, the WGS had been started up on August 16, 1998 at 0150. Prior to WGS startup the #3 Waste Gas Decay Tank (WGDT) H₂ concentration was 43.45% with O₂ concentration within limit. Due to an undetected leak on the Waste Gas Compressor (WGC) suction radiation monitor (R-13), air was being drawn into the system by the operation of the WGC, increasing the O₂ concentration. On August 16, 1998 at 0830, sampling and analysis showed the WGDT #3 to contain 29.5% H₂ and 7.86% O₂. The WGS was promptly shutdown. The tank H₂ and O₂ were diluted by nitrogen (N₂) addition to the maximum extent allowed by the tank pressure limit of 75 psig, but at 0930 the O₂ remained above the 4% limit of TS 3.11.2.5 action b. The tank contents were released, the tank was diluted again by N₂ addition, and TS 3.11.2.5 was met on August 17, 1998 at 0901. The leak was identified and isolated, and the WGS system was returned to service on August 18, 1998. This event was caused by an inadequate procedure in that no provisions existed for ensuring leak tightness of the monitor. Cognitive personnel error contributed to the event in that the operator did not respond properly to an increasing tank pressure trend. Procedures have been revised to provide leak checks upon reassembly. Operations procedures will be revised to provide for leak checks during system startup and periodic surveillance. Maintenance, Operations, and Chemistry personnel responsible for WGS will be trained on this event. The system operator involved will be coached.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (7-B F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET.

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TEXT (If more space is required, use additional NRC Form 366) (17)

Plant and System Identification

Westinghouse -- Pressurized Water Reactor
Energy Industry Identification System codes are identified in the text as [XX].

Description of Event

In preparation for a Unit 1 shutdown, the Waste Gas System (WGS) [WE] was started up in recirculation on August 16, 1998, at 0150. The waste gas catalytic hydrogen recombiners and analyzers were bypassed and no addition of waste gas to the WGS was in progress, although additions were planned. Therefore, at this time no additional sampling and analysis of the on-service Waste Gas Decay Tank (WGDT) was required. Prior to WGS startup WGDT #3 pressure was approximately 12.7 psig, and the tank contained 43.45% H₂ and 0.73% O₂. Unknown to the operator, a leak existed on R-13 [IL] allowing air to enter the system. This leak was previously undetected since the system had not been in service.

Later at 0423 the system operator logged the tank pressure as 20 psig and noted an increase of 7.3 psig, but took no action either to determine the reason for, or respond to, the change. At 0430 a very small gas addition was made to the WGS as a result of testing the sampling system. Based on this waste gas addition, control room personnel requested a sample and analysis of WGDT #3. The first sample, drawn at 0538 at a tank pressure of 23.5 psig, indicated 35.45% H₂ and 6.24% O₂. Historically, abnormal high O₂ sample results are indicative of air leaks into the sample system. Since no known additions were being made, these results were questioned by Chemistry personnel and were not reported to the control room. A confirmatory sample was taken using a different sample unit. The confirmatory sample was drawn at 0715 at 29 psig tank pressure. Results of the confirmatory sample analysis indicated 29.5% H₂ and 7.86 % O₂ in WGDT #3. Following receipt of these results, the control room entered a LCO action at 0830 due to not meeting the requirements of TS 3.11.2.5. Technical Specification 3.11.2.5 action statement b. requires that oxygen (O₂) concentration be reduced to less than or equal to 4% within one hour and less than or equal to 2% within 48 hours when Waste Gas System (WGS) hydrogen (H₂) concentration is greater than 4%. The WGS was promptly shutdown. Nitrogen (N₂) was added to WGDT #3 to dilute its contents to the maximum tank pressure of 75 psig. At this pressure, H₂ and O₂ concentrations of 14.02% H₂ and 5.72 % O₂ remained above the TS limits. Release of WGDT #3 was initiated on August 16, 1998 at 1045 and completed on August 17, 1998 at 0340. The tank was then repressurized with N₂ for additional dilution of H₂ and O₂. The tank was resampled and the LCO was exited on August 17, 1998 at 0901 based on H₂ and O₂ concentrations less than 2%.

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TEXT (If more space is required, use additional NRC Form 366) (17)

Troubleshooting on August 17 and 18, found a leak on Waste Gas Compressor suction radiation monitor R-13. The radiation monitor was isolated and the WGS was restarted with no further abnormal pressure increase.

Cause of Event

The cause of this event was an inadequate procedure resulting in a leak on the WGC suction radiation monitor (R-13). Leak testing was neither performed nor required following reassembly of the detector.

A contributing cause to the severity of this event is cognitive personnel error in that the system operator noted an increasing trend in tank pressure on August 16, 1998 at 0423 but took no action to determine the reason for and respond to the change. Had the WGC been secured at that time, instead of approximately 4 hours later, the total air ingress would have been much less.

Safety Assessment

The gas mixture in WGDT #3 was above the flammability limit, but the recombiner remained isolated throughout this event. Therefore the primary potential ignition source in the WGS was not present, and the danger of fire was minimal. No chemical analysis of the gas mixture at any time during the event reported the existence of an explosive mixture; therefore, the likelihood of a WGDT rupture due to this event was small. Based on data from the release calculations for this tank on August 16-17, 1998, the site boundary dose was much less than 1% of the Offsite Dose Calculation Manual (ODCM) quarterly limit for releases from the plant vent stack. The total radioactivity released from this tank on this release was 8.18E-2 curies, which is also much less than 1% of the accident analysis assumptions for a WGDT rupture. Therefore, had a WGDT rupture occurred, no significant radiological consequences would have resulted.

The health and safety of the public were unaffected by this event.

Corrective Action

Maintenance procedures for R-13 have been revised to perform a leak test on the detector prior to returning it to service after opening the system.

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TEXT (If more space is required, use additional NRC Form 366) (17)

Operations procedures will be revised to provide for leak checks during system startup and periodic surveillance by September 30, 1998.

The system operator involved will be coached by September 30, 1998.

Maintenance, Operations, and Chemistry personnel responsible for WGS will be trained on this event by October 14, 1998.

Additional Information

The following LERs have been submitted in the last two years on the subject of failure to operate in accordance with TS due to inadequate procedures:

LER 98-006-00 (Unit 2) Containment Penetration Overcurrent Protective Device Energized Due to Inadequate Procedure;

LER 96-004-01 (Shared) Surveillance Requirements Not Met for Manual Safety Injection Input Into the Reactor Trip System;

LER 96-002-00 (Unit 1) TS Surveillance Requirement Not Met and Common Cause Failure Identified;

LER 96-002-00 (Unit 2) Misapplication of Technical Specification 4.4.6 Requirements Regarding F*;

LER 97-014-00 (Unit 1) RCS Leak Detection System Inoperable Due to Defective Procedure Results in Operating in Condition Prohibited by TS;

LER 97-005-01 (Shared) Failure to Perform Nuclear Instrumentation Surveillance Requirements Prior to Mode 2 and 3 Entry;

LER 97-003-00 (Unit 2) Failure to Perform Diesel Generator Surveillance Requirements Due to Procedural Inadequacy; and

LER 98-001-00 (Unit 1) Inadequately Performed Surveillance Due to Improper Calculation of E-Bar.