

November 1, 2001  
NG-01-1270

Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
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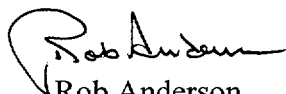
Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Op. License No: DPR-49  
Licensee Event Report #2001-004-00  
File: A-120

Dear Sirs:

Please find attached the subject Licensee Event Report (LER) submitted in accordance with 10CFR50.73. There are no new commitments contained within this report.

Should you have any questions regarding this report, please contact this office.

Sincerely,



Rob Anderson,  
Plant Manager - Nuclear

cc: Mr. James Dyer  
Regional Administrator, Region III  
U. S. Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, IL 60532

NRC Resident Inspector - DAEC

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<b>NRC FORM 366</b> (1-2001)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB NO. 3150-0104</b>		<b>EXPIRES 6-30-2001</b>						
<b>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)				Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.								
<b>FACILITY NAME (1)</b> Duane Arnold Energy Center				<b>DOCKET NUMBER (2)</b> 05000331		<b>PAGE (3)</b> 1 of 3						
<b>TITLE (4)</b> Unplanned High Pressure Coolant Injection Inoperability Due to Steam Leak in Drain Trap												
<b>EVENT DATE (5)</b>			<b>LER NUMBER (6)</b>			<b>REPORT DATE (7)</b>			<b>OTHER FACILITIES INVOLVED (8)</b>			
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER		
09	02	2001	2001	- 004	- 00	11	01	2001	FACILITY NAME	DOCKET NUMBER		
<b>OPERATING MODE (9)</b>		1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)</b>									
<b>POWER LEVEL (10)</b>		100	20.2201(b)			20.2203(a)(3)(ii)			50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)	
			20.2201(d)			20.2203(a)(4)			50.73(a)(2)(iii)		50.73(a)(2)(x)	
			20.2203(a)(1)			50.36(c)(1)(i)(A)			50.73(a)(2)(iv)(A)		73.71(a)(4)	
			20.2203(a)(2)(i)			50.36(c)(1)(ii)(A)			50.73(a)(2)(v)(A)		73.71(a)(5)	
			20.2203(a)(2)(ii)			50.36(c)(2)			50.73(a)(2)(v)(B)		OTHER	
			20.2203(a)(2)(iii)			50.46(a)(3)(ii)			50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A	
			20.2203(a)(2)(iv)			50.73(a)(2)(i)(A)		X	50.73(a)(2)(v)(D)			
			20.2203(a)(2)(v)			50.73(a)(2)(i)(B)			50.73(a)(2)(vii)			
			20.2203(a)(2)(vi)			50.73(a)(2)(i)(C)			50.73(a)(2)(viii)(A)			
			20.2203(a)(3)(i)			50.73(a)(2)(ii)(A)			50.73(a)(2)(viii)(B)			
<b>LICENSEE CONTACT FOR THIS LER (12)</b>												
<b>NAME</b> Clara J. Rushworth, Nuclear Licensing								<b>TELEPHONE NUMBER (Include Area Code)</b> 319-851-7157				
<b>COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)</b>												
CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX			
X	BJ	TRP	V080	N								
<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>								<b>EXPECTED SUBMISSION DATE (15)</b>		MONTH	DAY	YEAR
<b>YES (If yes, complete EXPECTED SUBMISSION DATE).</b>					X	<b>NO</b>						
<b>ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)</b>												
<p>On September 2, 2001, while operating at 100% power, the High Pressure Coolant Injection (HPCI) steam supply line drain trap developed a steam leak that required the drain trap to be manually isolated. The steam leak was due to the outlet plug failing on the drain trap. After the trap was isolated, the HPCI steam supply drain pot high level alarm was received and the HPCI system was declared inoperable. The cause of the plug failure was the eroded state of the plug and plug threads due to flow accelerated corrosion (FAC). The FAC resulted from steam leaking by the valve seat. The root cause is ineffective preventive maintenance (PM). A contributor is less-than-adequate past corrective action. Corrective actions will include repair/replacement of the drain trap and evaluation of the rebuild frequency.</p> <p>There were no actual safety consequences associated with this event. There was no impact on public health and safety. There were no systems, structures, or components that were inoperable at the start of the event that contributed to the event. This event is reportable under 50.73(a)(2)(v)(D).</p>												

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Duane Arnold Energy Center	05000331	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 of 3
		2001	- 004	- 00	

**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

**I. Description of Event:**

On September 2, 2001, while operating at 100% power, the High Pressure Coolant Injection (HPCI) steam supply line drain trap developed a steam leak that required the drain trap to be manually isolated. The steam leak was due to the drain trap outlet plug on DT2209 failing.

At 1308, shortly after the drain trap was isolated, the HPCI steam supply drain pot high level alarm was received; the HPCI system was declared inoperable and the 14-day completion time associated with Condition F of Technical Specification 3.5.1 was entered.

The outlet plug on the drain trap was subsequently replaced and HPCI operability restored. At 2208 on September 2, 2001, TS Limiting Condition for Operability (LCO) 3.5.1, Condition F was exited.

Unplanned HPCI system inoperability is reportable under 50.73(a)(2)(v)(D) as a single train failure that could have prevented the fulfillment of a safety function of structures or systems to mitigate the consequences of an accident.

**II. Cause of Event:**

The causal factor is the eroded state of the plug and plug threads due to flow accelerated corrosion which resulted from steam leaking by the valve seat in the drain trap. The root cause is ineffective preventive maintenance. A contributor is less-than-adequate past corrective action.

**Preventive Maintenance:**

The vendor recommended that the trap be rebuilt every five years. DT2209 had been scheduled for this rebuild in 1998, but the frequency was changed to "on-demand" and the trap was not disassembled and rebuilt. This decision was based on the use of predictive monitoring (thermography) on this component. While the use of thermography was stated as the basis for changing the rebuild frequency for DT2209 to on-demand, the Preventive Maintenance Action Request Input Request (PIR) did not provide demonstrative evidence that thermography was a suitable substitute for the five year rebuild. Input from the Thermography Program Owner was not apparent.

**Past Corrective Action:**

In 2000, Reactor Core Isolation Cooling (RCIC) drain line piping downstream of a drain trap experienced a steam leak due to wall thinning. The wall thinning appeared to be due to flow accelerated corrosion. The RCIC drain trap had degraded and allowed excess flow through the drain line for a month or more prior to the steam leak.

This RCIC drain trap is very similar to HPCI DT2209 in both service condition and design. While Action Requests were initiated to replace the piping, the generic implications of this failure were not assessed. Such review may have identified the potential for similar degradation occurring in DT2209.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

**III. Assessment of Safety Consequences :**

There were no systems, structures, or components that were inoperable at the start of the event that contributed to the event. Variations in plant operating mode would not have increased the safety significance of this event. This event did not affect the availability of other systems needed to maintain safe shutdown conditions, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident. There was no effect on public health and safety as a result of this event.

**IV. Corrective Actions:**Completed Actions:

1. The outlet plug on DT2209 was replaced on September 2, 2001.
2. Thermography was performed which indicated that DT2209 was leaking by. Radiography performed on the three elbows in the drain line directly downstream of DT2209 indicated wall thinning had occurred. An evaluation was performed to demonstrate that adequate piping thickness remained for continued operation pending the pipe replacement. (Repair/replacement of DT2209 and affected piping is planned to occur prior to the end of 2001.)

Follow-up Actions:

1. Drain trap DT2209 will be repaired/replaced, as appropriate, prior to the end of 2001.
2. The affected drain piping downstream of DT2209 will be replaced prior to the end of 2001.
3. The rebuild frequency for DT2209 will be evaluated and revised, as appropriate.
4. The effectiveness of predictive monitoring methods (thermography) used on drain traps will be evaluated.
5. The need for enhancements to the Preventive Maintenance Procedure will be evaluated, specifically the need for additional guidance regarding the validation of techniques used as substitutions for Preventive Maintenance.
6. Apparent Cause guidelines, which include a requirement to assess extent of condition for issues below the Root Cause level, are currently being added to the Root Cause procedure.

**V. Additional Information:**Previous Similar Occurrences:

A review of LERs at DAEC over the last 3 years did not find any previous similar events.

ELIS System and Component Codes:

High Pressure Coolant Injection System: BJ

Drain Trap: TRP

A 10CFR50.72(b)(3)(v)(D) notification was made on September 2, 2001 (Event Number 38261). This report is being submitted pursuant to 10CFR50.73(a)(2)(v)(D).