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Duane Arnold Energy Center
Operated by Nuclear Management Company, LLC

January 6, 2004

NG-03-0900
10 CFR 50.73

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Duane Arnold Energy Center
Docket 50-331
License No. DPR-49

Licensee Event Report #2003-005-00

Please find attached the subject Licensee Event Report (LER) submitted in accordance with 10 CFR 50.73. There are no new commitments contained within this report. Should you have any questions regarding this report, please contact this office.

Mark Peifer
Site Vice President, Duane Arnold Energy Center
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NRC FORM 366 (1-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

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.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Duane Arnold Energy Center	05000331	1 of 4

TITLE (4)
Unplanned Manual Reactor Scram due to High Reactor Coolant Conductivity

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	07	2003	2003	– 005 –	00	01	06	2004	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	1
POWER LEVEL (10)	45

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)

	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)	X	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 Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		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)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Robert Murrell, Regulatory Affairs	319-851-7900

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 7, 2003, during a plant startup, a manual reactor scram was inserted due to increasing reactor water conductivity (>5.0 µmho/cm). Plant Abnormal Operating Procedures require a scram to be inserted when conductivity exceeds 5.0 µmho/cm. Conductivity increase begun on November 6, 2003. All plant systems responded as expected to this event including Primary Containment Isolation System groups 2, 3, and 4, which isolated due to reactor water level dropping below 170". The reactor water level drop is normal following a scram from 45% power due to void collapse in the reactor vessel. Reactor water level was restored to normal and the group isolations were reset.

Extensive evaluations were conducted and determined the cause of the increasing conductivity to be attributed to a resin intrusion. Trouble shooting activities determined that a single condensate demineralizer, 1T013E, had several septa installed that were not manufactured to the appropriate length. These septa allowed resin to be transported out of the system and subsequently into the reactor vessel. The affected demineralizer was repaired and successfully returned to service.

There were no actual safety consequences associated with this event. There was no effect on public health and safety as a result of this event. This event is reportable under 10CFR50.73(a)(2)(iv)(A).

I. Description of Event:

On November 7, 2003, during a plant startup, a manual reactor scram was inserted due to increasing reactor water conductivity (>5.0 µmho/cm). Plant Abnormal Operating Procedures require a scram to be inserted when conductivity exceeds 5.0 µmho/cm. The conductivity increase begun on November 6, 2003. All plant systems responded as expected to this event.

As part of a troubleshooting plan, all condensate demineralizers (A-B-C-D-E) were tested to determine if any resin leakage could be observed and results concluded there was no indication of septa (i.e. filter element) failure. Apparent Cause Evaluation (ACE 01310), at the time, determined that observed reactor water quality problems were due to a resin intrusion from an undetermined source.

On November 17, 2003, reactor water conductivity increased to a value of 1.29 µmho/cm and sulfate to 200 ppb. Per Plant Chemistry Procedure (PCP) 1.9, Water Chemistry Guidelines, this was determined to be a Chemistry Action Level 3 condition, which directs a plant shutdown unless the condition is restored. Steps to reduce reactor power were initiated and another bench top sample was taken. Reactor power was reduced to approximately 32% and the 1T013E condensate demineralizer was taken out of service. In this time period, reactor water conductivity and sulfate started to decrease. This chemistry trend indicated the 1T013E could be the source of the water chemistry excursions.

During subsequent trouble shooting activities, a direct correlation was made between 1T013E and reactor water quality problems. Specifically, condensate demineralizer 1T013E had recently been reassembled, under a pre-planned task (PPT1125550), with new filter elements (i.e. septa) on November 6, 2003. Following this maintenance, the chemistry excursions discussed above (2 total) occurred when the 1T013E condensate demineralizer was exposed to increased flows during reactor power increases.

Due to reactor water chemistry trending, and the direct correlation to the demineralizer beds in service at the time of the events, it was determined that the chemistry excursion was a result of a resin intrusion (a resin intrusion to the reactor vessel from the condensate demineralizer system would cause the same reactor water chemistry conditions described above). Therefore, a corrective work order (CWO A64120) was initiated to disassemble the 1T013E condensate demineralizer and inspect it for anomalies that could have caused the reactor water chemistry excursions.

II. Cause of Event:

A detailed root cause evaluation of the event will be completed separately, however, initial reviews of the event were utilized in support of this report performed under Condition Evaluation (CE) 001384.

II. Cause of Event: (continued):

The disassembly of 1T013E discovered several issues with the configuration of the septa. Specifically, leak paths were created by septum found disengaged from quick disconnect fittings, septum found with loose quick disconnect fittings, and gaps between the fittings and the lower septum seal. Further investigations discovered that approximately 72 septa were manufactured in length less than the required length and created the conditions discovered. Therefore, it has been determined that 1T013E condensate demineralizer configuration was not acceptable due to the resin leak path created by the incorrect septum length.

The detailed root cause evaluation for the inadequate configuration of 1T013E will be completed under Root Cause Evaluation (RCE) 001016.

III. Assessment of Safety Consequences:

No immediate effects resulted from the resin intrusion into the reactor vessel. Per PCP 1.9, Water Chemistry Guidelines, the Action Levels for chemical excursions in the reactor vessel have been established to mitigate consequences associated with any adverse effects on reactor vessel internals. Additionally, other systems associated with controlling and mitigating effects of chemical excursions (i.e. Reactor Water Cleanup (RWCU), Noble Metal Chemical Application, Hydrogen Water Chemistry, etc...) were in place at the time of the event to assist in protecting the reactor vessel and internals.

Any long-term degradation effects on the reactor vessel internals would be detected and corrected as necessary under the existing In-service Inspection Program (ISI). Additionally, the resin escape path described for the 1T013E condensate demineralizer existed due to out-of-specification septa, which had just been placed in service November 6, 2003. Consequently, the resin intrusion did not occur continuously and was cleaned out of the primary system through condensate system flushing and subsequent cleanup by the other (4) available demineralizers. Additionally, the RWCU system assisted in cleaning the resin out of the reactor water.

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.

Therefore, there were no actual safety consequences associated with this event. There was no effect on public health and safety as a result of this event.

IV. Corrective Actions:

Modification package ECP-1680 removed the incorrectly manufactured septa with septa of correct length. The replaced septa are now identical to the septa in the other condensate demineralizers.

Further corrective actions, as needed, will be conducted after completion of RCE001016.

V. Additional Information:

Previous Similar Occurrences:

A review of LERs at the DAEC over the last 3 years identified no LERs with similar causes.

EIIS System and Component Codes:

Condensate and Feedwater Chemistry Control System: KD

Reporting Requirements:

A 10CFR50.72(b)(3)(iv) notification was made on November 7, 2003, and is listed as event number EN 440301. This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A).