Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324
Telephone 319 851 7611
Fax 319 851 7611

IES UTILITIES

November 25, 1996
NG-96-2553

Mr. A. Bill Beach
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60532

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Licensee Event Report #96-06
File: A-118a

Gentlemen:

Please find attached a copy of the subject Licensee Event Report in accordance with 10CFR50.73. There are no new commitments made in this letter.

Sincerely,

Gary Van Middlesworth

Gary Van Middlesworth
Plant Manager - Nuclear

cc: Director of Nuclear Reactor Regulation
Document Control Desk
U. S. Nuclear Regulatory Commission
Mail Station P1-37
Washington, D. C. 20555-0001

NRC Resident Inspector - DAEC
DOCU

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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98

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.

LICENSEE EVENT REPORT (LER)

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

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4)
Non-conservative APRM 15% Scram Setpoint Due to Inadequate Procedure

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	DOCKET NUMBER
10	26	96	96	-- 06 --	00	11	25	96		05000-331
									FACILITY NAME	DOCKET NUMBER 05000-331

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
POWER LEVEL (10)	0	20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)	X	50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Hai Tran, Licensing Engineer	(319) 851-7491

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION	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 October 26, 1996, the plant was in the refuel mode with core alterations in progress. At about 0625 hours, the Operations Shift Supervisor (OSS) and the Shift Technical Advisor (STA) determined that the plant did not meet the Technical Specifications. Core alterations had been performed for more than an hour while the Average Power Range Monitor (APRM) 15% High Flux Trip function was non-conservative with respect to Technical Specifications. The cause of the event was a failure to bypass the twenty-four Local Power Range Monitors (LPRMs), which had been replaced October 21, 1996. Although a sufficient number of operable LPRMs were in service for core monitoring, the configuration of the replaced LPRMs (cables disconnected and the LPRM mode selector switches in "Operate") caused the APRMs to indicate a neutron power level lower than actual. This in turn caused the APRM 15% High Flux Trip function to be non-conservative. The primary root cause of the event was the inadequate LPRM Replacement Procedure which did not instruct personnel to bypass the LPRMs prior to disconnecting the LPRM cables.

The OSS immediately halted core alterations and verified that all control rods were fully inserted. Other corrective actions (planned and completed) include revising the procedures for the LPRM replacement, maintenance, core alterations, and reviewing this event for training as determined necessary.

This report is being submitted pursuant to 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(A).

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

I. DESCRIPTION OF EVENT:

On October 26, 1996, the plant was in the refuel mode with core alterations in progress. The plant had been in the refuel outage since October 11, 1996. Core alterations had been in progress since October 25, 1996 at 0558 hours.

On October 21, 1996, six Local Power Range Monitor (LPRM) strings (twenty-four LPRM detectors) were replaced. After replacement, the signal cables for the LPRM strings in panel 1C37 remained disconnected for further testing of the LPRM detectors. The LPRM mode selector switches in the control room back panel area remained in "Operate".

In this configuration, with the cables disconnected and LPRM mode selector switches in "Operate", the LPRMs were inoperable. However, the LPRM input counter would still see and count the inoperable LPRMs as if they were "operable" because of the position of the switches, and the Average Power Range Monitor (APRM) averaging circuit would sum and average the inoperable LPRMs along with the operable LPRMs. Although the APRMs were not indicating any power level because the reactor was in the shutdown mode, the final effect was that the APRMs would indicate a neutron power level lower than actual (non-conservative). This in turn caused the APRM 15% High Flux Trip function to be non-conservative with respect to the requirement specified in the Technical Specifications, Section 2.1.A.2.

On October 26, 1996, at about 0625 hours, the Operations Shift Supervisor (OSS) and the Shift Technical Advisor (STA) in the control room were making preparations to transfer the power supply for the 'B' Reactor Protection System (RPS) from the Alternate Power Supply Source to its normal Motor-Generator (MG) Set Power Supply. The OSS reviewed the procedural requirements to perform this evolution and requested that the STA perform an independent review. While performing the independent review, the STA walked down the panels in the control room to check for other potential impacts on this evolution. At the Neutron Monitoring Panel 1C37, the STA checked the status of the replaced LPRMs and questioned if the replaced LPRMs should be bypassed. The OSS and the STA determined that the LPRMs should have been placed in "Bypass" instead of "Operate".

Technical Specification 2.1.A.2 requires that the APRM 15% High Flux Trip function be operable whenever the reactor is in REFUEL, STARTUP, HOT SHUTDOWN, or COLD SHUTDOWN Mode. In addition, action 3 in Table 3.1-1, 2.a. and c. requires action be taken to suspend all operations involving CORE ALTERATIONS and insert all insertable control rods within one hour when the APRM 15% Neutron High Flux Trip is inoperable. Because core alteration was in progress since October 25, 1996 at 0558 hours, while the APRM 15% High Flux Trip function was non-conservative, Technical Specification requirements were not met. In addition, action 41 in Table 3.2-c requires that a "Rod Block" signal be inserted within one hour when two or more APRM channels per trip function are inoperable. This action requirement was not noted until after the disconnected LPRMs had already been bypassed and all six APRMs had been restored to operable status. The action was no longer required. The disconnected LPRMs were bypassed on October 26, 1996 at 1333 hours by the operators in order to restore APRM operability for core alterations.

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

II. CAUSE OF EVENT:

The cause of the non-conservative APRM 15% High Flux Trip function was the failure to bypass the LPRMs being replaced. The primary root cause of this event was an inadequate LPRM Replacement Procedure which did not instruct personnel to bypass the LPRMs prior to disconnecting the LPRM cables. The procedure was used for the LPRM replacement planning and the actual replacement, but it did not instruct personnel to bypass the LPRMs prior to disconnecting the LPRM cables. Consequently, the need to bypass the LPRMs was overlooked and the replaced LPRMs were not bypassed. Vendor documents for equipment maintenance do not address system status requirements when performing replacement. A contributing factor to this event was that the personnel involved in the task did not consider the effect of the inoperable LPRMs if not bypassed. The personnel focused on ensuring the required number of LPRMs were operable, not on the position of the LPRM mode selector switches for the LPRMs being replaced.

III. ANALYSIS OF EVENT:

The 15% APRM High Flux Scram is not the only barrier to prevent exceeding the safety limit. Other barriers such as the Source Range Monitor (SRM) system would provide an indication of the potential for reactor criticality and generate a control rod block signal on high neutron flux levels; the Intermediate Range Monitor (IRM) system would provide an indication of local power, and generate control rod blocks and scram signals on high neutron flux levels; and the refueling interlock logic would prevent the removal of more than one control rod and prevent the insertion of fuel bundles into the core unless all control rods were fully inserted. All these systems were operable throughout the event; consequently, plant safety was not impacted.

Per the Nuclear Operational Safety Analysis (APED-A61-039, State A) for the DAEC, the APRM system provides no safety action when the reactor is in the refuel mode. Consequently, under NUREG 1433, "Improved Standard Technical Specifications for BWR-4", the APRM 15% High Flux Trip function will not be required when the reactor is in the refuel or shutdown mode.

IV. CORRECTIVE ACTIONS:

Upon discovery, the OSS immediately halted core alterations and verified that all control rods were fully inserted. A meeting was held to discuss the event in detail and initiate corrective actions. At 1333 hours, on October 26, 1996, the disconnected LPRMs were placed in "Bypass" with "CAUTION" tags on them and core alterations were authorized to commence at 1338 hours. The Prerequisite Checklist of the Core Alterations procedure was re-performed to ensure all other requirements were met. Other LPRMs were determined to be operable since no maintenance was performed on them.

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

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

1. As a long term corrective action to prevent recurrence of this event, the LPRM Replacement Procedure (RFP 504) has been revised to verify the LPRMs are in "Bypass" if being replaced.

2. The data base of the maintenance work documents for the LPRM replacement has been revised to ensure the LPRMs are bypassed prior to disconnecting the LPRM cables.

3. The Core Alterations Procedure (RFP 403) has been revised to verify the LPRMs are in "Bypass" if being replaced.

4. The maintenance procedure, ELECON-R220-001, "REUTER-STOKES (LEMO), LPRM Under Vessel Connector Replacement", has been revised to bypass the LPRMs prior to disconnecting the LPRM cables.

5. The lessons learned from this event have been shared with the industry via the INPO Nuclear Network.

6. The Operating Instruction (OI 878.3, "LPRM System") will be reviewed for appropriate revision. Appropriate revision will be completed by January 7, 1997.

7. A "Training Management Action Request" has been initiated to review this event for training as determined necessary. The review will be completed by December 6, 1996.

IV. ADDITIONAL INFORMATION:

A) Previous Similar Events:

A review of the DAEC Licensee Event Reports since 1984 did not identify any similar event.

B) EIIS System and Component Codes:

Average Power Range Monitor -- IG
Local Power Range Monitor -- IG
Detector -- DET

This report is being submitted pursuant to 10CFR50(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(A).