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October 30, 1996
NG-96-2318

Mr. 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 #96-04
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
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
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LICENSEE EVENT REPORT (LER)

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

Duane Arnold Energy Center

DOCKET NUMBER (2)

05000-331

PAGE (3)

1 OF 3

TITLE (4)

High Pressure Coolant Injection (HPCI) System Isolation Due to Misplaced Relay Block During Testing

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	08	96	96	04	00	11	06	96	FACILITY NAME	DOCKET NUMBER
										05000-331
									FACILITY NAME	DOCKET NUMBER
										05000-331

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)			
POWER LEVEL (10)	93	20.2201(b)	20.2203(a)(2)(v)	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)(iii)	50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)	X 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

Leonard L. Sueper, Principal Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(319) 851-7365

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On October 8, 1996, with the plant operating at 93% power in coast down prior to a refueling outage, two technicians inadvertently caused a Primary Containment Isolation System (PCIS) closure of the High Pressure Coolant Injection (HPCI) outboard steam supply isolation valve, MO2239, during the performance of surveillance test procedure, STP 42A026-Q, "HPCI Steam Line High DP Instrument Functional Test/Calibration". The valve closure resulted from a misplaced relay contact block which would have prevented the isolation during the calibration of HPCI Steam Flow Indicating Switch PDIS2245.

The cause of the isolation was personnel error. Contacts 1-2 on relay E41-K33 were to have been blocked open to inhibit the isolation signal caused by the actuation of PDIS2245 during calibration. Instead, contacts 11-12 were blocked which had the effect of preventing an annunciator from indicating that PDIS2245 had actuated.

In response to this event, the front of all identified General Electric HGA and HFA relays were labeled to indicate contact locations. Management conducted meetings with all plant maintenance personnel reinforcing the expectations for self-checking, independent verification and dual verification. The plant I&C technicians received additional briefings on self-checking, independent verification, and dual verification that included practical exercises at the plant simulator.

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TEXT CONTINUATION

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

I. DESCRIPTION OF EVENT

On October 8, 1996, the plant was operating at 93% power in coast down prior to a refueling outage when two technicians, an IES (utility) employee and a contractor, began testing the "B" logic of surveillance test procedure, STP 42A026-Q, "HPCI [High Pressure Coolant Injection System] Steam Line High DP Instrument Functional Test/Calibration". One of the initial steps in the procedure is to block open contacts 1-2 on relay E41A-K33 to prevent a HPCI steam line high differential pressure automatic isolation during the calibration of differential pressure indicating switch PDIS2245. Instead, contacts 11-12 were mistakenly blocked open. The technicians then proceeded to instrument rack 1C126B and began to pressurize the high pressure side of PDIS2245 while monitoring the voltage across the switch contacts with a digital volt/ohm meter (VOM) to detect its actuation. During the calibration, but prior to reaching the trip setpoint, an isolation signal occurred which caused the HPCI outboard steam supply isolation valve, MO2239, to close.

At approximately 2254, the control room received annunciators 1C03C, A-5, "HPCI TURBINE TRIP SOLENOID ENERGIZED", and A9, "HPCI 'B' LOGIC AUTO ISOLATION INITIATED". In addition, the amber "B" HPCI logic isolation light actuated, indicating MO2239 had isolated. Upon receiving the isolation signal, several members of the control room staff investigated. To the best of their recollection, E41A-K33 (located in the control room back panel area) was not energized. The control room operators then paged the IES technician (by now 1-2 minutes had elapsed since the isolation occurred). The technician stated he heard a page for him, but continued to pressurize PDIS2245 until it actuated. The technician then called the control room to inform them that PDIS2245 had closed. The control room operator notified the technician that an isolation had occurred. At this time the operators confirmed that E41A-K33 was energized. However, the annunciator actuated directly from E41A-K33, 1C03C, B-8, "HPCI STEAM LINE HI FLOW", did not alarm.

At that time the test was halted, the relay block was placed on the proper contacts and the test was reperformed satisfactorily using a different VOM.

II. CAUSE OF EVENT

The cause of this event was personnel error. E41A-K33 is a General Electric model HFA relay which has six sets of contacts. When viewed from the back, where the electrical connections to the relay are made, the contacts are physically numbered with contacts 1-2 on the left side of the relay and contacts 11-12 on the right. When viewed from the front of the relay, where the contacts are blocked, the order is reversed (i.e., contacts 1-2 are on the right and contacts 11-12 are on the left). The IES technician that installed the contact block was knowledgeable on HFA relays and had successfully performed STP42A026-Q in the past, including the previous quarter. The technician installed the block based on his memory of the relay contact numbering scheme (he had it reversed). The contract technician assigned to assist and provide independent verification did not have prior experience with HFA relays. The contract technician, who had received site-specific training on performing independent verifications prior to being assigned to this work, stated that during the testing on the "A" logic the previous night, he had confirmed the location of relay contacts by inspecting the back of the equivalent relay. However, that relay is a GE HGA relay which has fewer contacts than a HFA relay. On the night of the event, the contractor stated that he had accepted the IES technician's explanation of the numbering scheme for HFA relays and then acknowledged that the contacts the IES technician pointed to (the two on the left as viewed from the front of the relay) were 1-2 prior to the contacts being blocked open.

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

III. ANALYSIS OF EVENT

This event had no adverse effect on the safe operation of the plant. The PCIS isolation occurred as designed and was reset without incident. The isolation is intended to prevent steam from escaping from primary containment in the event of a steam supply line break downstream of MO2239. HPCI was not in operation or needed at the time and could have been made available within a short period of time. The Reactor Core Isolation Cooling system and the remaining Emergency Core Cooling Systems were operable throughout this event.

IV. CORRECTIVE ACTIONS

In response to this event, the front of all identified HGA and HFA relays were labeled to indicate contact locations. Management conducted meetings with all plant maintenance personnel reinforcing the expectations for self-checking, independent verification and dual verification. In addition, the plant I&C technicians received additional briefings on self-checking, independent verification, and dual verification that included practical exercises at the plant simulator.

IV. ADDITIONAL INFORMATION

The cause of the isolation occurring prior to the actuation of PDIS2245 is unknown. PDIS2245 is a Barton Model 288 pressure differential indicating switch. This model of switch is not prone to inadvertent actuation due to bumping and is unlikely to have provided a spurious actuation as a result of the valve manipulations and test connections that were made in support of the calibration. Other nearby instruments were also reviewed. However, none were found that would have resulted in a similar isolation when bumped. The VOM used to detect the actuation of PDIS2245 was inspected and found to be functioning properly.

A) PREVIOUS SIMILAR EVENTS

LERs 91-07, 92-14, and 95-07 reported events caused by problems related to relay blocks. None of these events occurred due to misplaced contact blocks.

B) EEIS SYSTEM AND COMPONENT CODES

HPCI-----BN
PCIS-----JM
Relay-----RLY
Pressure Switch-----PDIS
Isolation Valve-----ISV

C) Equipment Information:

E41A-K33 is a General Electric model 12HFA151A2F relay.
PDIS2245 is a Barton model 288 pressure differential indicating switch.

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