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ACCESSION NBR: 8707280311 DOC. DATE: 87/07/24 NOTARIZED: NO DOCKET #
 FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331
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 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER S7-021-00: on 870624, reported that GE relays may not be seismically qualified to specs in Section 3.10.1.1 of updated FSAR. Caused by inconsistent test data for seismic qualification. Relays replaced. W/870724 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTR ENCL
	PD3-1 LA	1 1	PD3-1 PD	1 1
	CAPPUCCI, A	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADE	1 0
	NRR/DEST/ADS	1 0	NRR/DEST/CEB	1 1
	NRR/DEST/ELB	1 1	NRR/DEST/ICSB	1 1
	NRR/DEST/MEB	1 1	NRR/DEST/MTB	1 1
	NRR/DEST/PSB	1 1	NRR/DEST/RSB	1 1
	NRR/DEST/SGB	1 1	NRR/DLPQ/HFB	1 1
	NRR/DLPQ/GAB	1 1	NRR/DOEA/EAB	1 1
	NRR/DREP/RAB	1 1	NRR/DREP/RPB	2 2
	NRR/PMAS/ILRB	1 1	NRR/PMAS/PTSB	1 1
	REG FILE 02	1 1	RES DEPY GI	1 1
	RES TELFORD, J	1 1	RES/DE/EIB	1 1
	RGN3 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Duane Arnold Energy Center (DAEC)	DOCKET NUMBER (2) 05000331	PAGE (3) 1 OF 04
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TITLE (4)
Replacement of Selected Relays Due to Inadequate Seismic Qualification

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 NAMES	DOCKET NUMBER(S)	
06	24	87	87	021	00	07	24	87	None	050000	
									050000		

OPERATING MODE (9) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)									
POWER LEVEL (10) 000	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.38(c)(1)	<input checked="" type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 365A)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	10 CFR 21						
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)							

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME John Reinholdt, Technical Support Engineer		AREA CODE	3119851-71306

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
B	BORLIY	G082		NO	B	BJRLY	G082		NO
B	BMRLIY	G082		NO	B	BJRLY	G082		NO

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)			<input checked="" type="checkbox"/> NO			

ABSTRACT (Limit to 400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On June 24, 1987 the reactor was in cold shutdown for a refuel outage when it was reported that General Electric (GE) HGA11 and HGA111 relays may not be seismically qualified to the specifications in section 3.10.1.1 of the Updated Final Safety Analysis Report (UFSAR). This report was based on information in GE Service Advisory Letter (SAL) 721-PSM-174.1.

GE SAL 721-PSM-174.1 indicated the GE HGA11 and HGA111 relays are subject to contact chattering with accelerations above about 0.35g. The concern is for relays in the de-energized state utilizing the normally closed contacts for a safety related function. These contacts cannot be relied upon to maintain continuity during a seismic event involving horizontal accelerations of greater than 0.35g.

After reviewing the applications of HGA11 and HGA111 relays, it was determined that contact chatter in 14 relays could have potentially prevented or delayed the fulfillment of a safety function during a concurrent seismic event/design basis accident. Therefore, each of the 14 relays were replaced with GE Century type HFA relays before startup from the 1987 refuel outage.

This event is being reported pursuant to 10 CFR 50.73(a)(2)(v)(A) and 10 CFR 21.

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		87	021	00	02	OF	04

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

On June 24, 1987 the reactor was in cold shutdown for a refuel outage and efforts were in progress to order General Electric (GE) HGA relays for stock. It was discovered and reported during the procurement process that GE HGA11 and HGA111 relays may not be seismically qualified to the specifications in section 3.10.1.1 of the Updated Final Safety Analysis Report (UFSAR). This report was based on information in GE Service Advisory Letter (SAL) 721-PSM-174.1, "PVD and HGA Seismic Data".

HGA relays were originally supplied with the understanding their seismic qualification was consistent with UFSAR 3.10.1.1 which states: "All instrumentation required for nuclear safety is capable of performing all functions important to safety during normal reactor operation, design-basis accidents and postaccident operation while being subjected to accelerations that are in excess of those calculated for the DBE at the point of attachment of the instrument (or module) to the building structure. Qualification is achieved by test and/or analysis at acceleration values of 1.5g horizontal and 0.5g vertical over a frequency range of 0.25 to 33 Hz."

Subsequently GE issued SAL 721-PSM-174.1 which indicated the GE HGA11 and HGA111 relays are subject to contact chattering with accelerations above about 0.35g. The concern is for relays in the de-energized state utilizing the normally closed contacts for a safety related function. These contacts cannot be relied upon to maintain continuity during a seismic event involving horizontal accelerations of greater than 0.35g. According to GE, the relays will function properly following a seismic event.

The root cause of this deviation appears to be inconsistent test data obtained by GE for the seismic qualification of HGA11 and HGA111 relays.

A search of the DAEC equipment data base and plant drawings revealed 241 HGA11 and HGA111 relays were used in various logic systems. Therefore, each HGA11 and HGA111 relay was evaluated to determine if it was normally de-energized with normally closed contacts used for a safety related function. Those relays found to fit the above criterion were further analyzed to determine, 1) the affect of contact chatter during a concurrent seismic event/design basis accident and, 2) the affect of contact chatter (seismic event) during normal power operation. The review concluded that contact chatter in 14 relays could have potentially prevented or delayed the fulfillment of a safety function during a concurrent seismic event/design basis accident. These relays were installed in the control logic for the Low Pressure Coolant Injection (LPCI), High Pressure Coolant Injection (HPCI), Core Spray, and Reactor Core Isolation Cooling (RCIC) systems (EIIS Systems BO, BJ, BM, and BN respectively). The 14 relays and their system/function are tabulated in Attachment 1.

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

Each of the 14 relays were replaced with seismically qualified GE Century type HFA relays by June 26, 1987. Reactor startup from the 1987 refuel outage began on June 27, 1987.

Design basis seismic loadings did not occur during the service life of the 14 relays that were replaced. Therefore, the failure of the relays to operate under these conditions was not experienced.

This event is being reported pursuant to 10 CFR 50.73 (a)(2)(v)(A). On July 24, 1987, an evaluation concluded that this condition is also reportable pursuant to 10 CFR 21 as a noncompliance on the part of General Electric, 175 Curtner Avenue, San Jose, California, 95125. Verbal notification to the Region III Administrator was made on July 24, 1987.

Based on the potential significance of this defect and the similarity of nuclear plant designs, it is recommended that all nuclear facilities review GE SAL 721-PSM-174.1 for applicability.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Attachment 1

Relay	System	EIIS No.	Function
E11A-K027A/B	LPCI Loop Select Logic	BO	Normally closed contacts provide power to relays which trip both recirculation pumps when one recirc pump is detected not to be running.
E11A-K066A	LPCI	BO	Normally closed contacts provide close signal to 'A' side RHR (LPCI) inboard isolation valve (M02003).
E11A-K067B	LPCI	BO	Normally closed contacts provide close signal to 'B' side RHR (LPCI) inboard isolation valve (M01905).
E11A-K072A/B	LPCI	BO	Normally closed contacts provide power to relays which auto start the A/B RHR (LPCI) pumps.
E11A-K076A/B	LPCI	BO	Normally closed contacts provide power to relays which auto start the C/D RHR (LPCI) pumps.
E21A-K014A/B	Core Spray	BM	Normally closed contacts provide open signals to the inboard core spray valves.
E21A-K015A/B	Core Spray	BM	Normally closed contacts provide auto start signals to the core spray pumps.
E41A-K036	HPCI	BJ	Normally closed contacts provide open signals to HPCI turbine steam supply valve (M02238) and HPCI pump suction valve from suppression pool (M02321).
E51A-K046	RCIC	BN	Normally closed contacts provide open signals to RCIC pump discharge valve (M02512).

Iowa Electric Light and Power Company

July 24, 1987
DAEC-87-0818

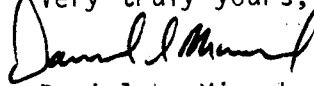
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Washington, D. C. 20555

Subject: Duane Arnold Energy Center
Docket No. 50-331
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Licensee Event Report No. 87-021

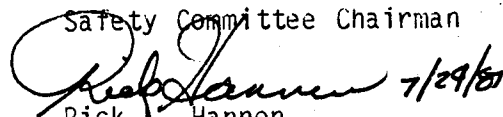
Gentlemen:

In accordance with 10 CFR 50.73 and 10 CFR 21 please find attached a copy of the subject Licensee Event Report.

Very truly yours,



Daniel L. Mineck
Safety Committee Chairman

 7/29/87

Rick L. Hannen
Plant Superintendent - Nuclear

RLH/JPR/go

Attachment - LER 87-021

cc: Mr. A. Bert Davis
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

NRC Resident Inspector - DAEC

File A-118a

Director, Office of Inspection and Enforcement (3 copies)
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