

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8708260214 DOC DATE: 87/08/24 NOTARIZED: NO DOCKET #
 FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331
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SUBJECT: LER 87-024-00: on 870725-0804, RWCU sys isolated six times from steam leak detection logic initiation signals. Caused by ambient RWCU room temp switch isolation setpoint drift. Installation of louvers to be investigated. W/870824 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 6
 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/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
	<u>REG FILE</u> 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)

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TITLE (4)
Reactor Water Cleanup Isolations Due to Steam Leak Detection Logic Initiations

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		
									None		
0 7	2 5	8 7	8 7	0 2 4	0 0	0 8	2 4	8 7	DOCKET NUMBER(S) 0 5 0 0 0		

OPERATING MODE (8) N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)																								
POWER LEVEL (10) 0 9 3	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(c)	60.36(c)(1)	60.36(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(ix)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)		

LICENSEE CONTACT FOR THIS LER (12)

NAME Bradford N. Thomas, Technical Support Engineer	TELEPHONE NUMBER AREA CODE: 3 1 9 8 5 1 - 7 3 0 9
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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)

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

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

From July 25, 1987 through August 4, 1987 with the plant in power operation, the Reactor Water Cleanup (RWC) System isolated six times from steam leak detection logic initiation signals. The isolations were caused by ambient RWC room temperature switch isolation setpoint drift, spurious electrical signals, signals generated by a hand held radio, and a differential temperature switch reaching its isolation setpoint following the removal of plastic which was covering the inlet ventilation louvers on the RWC room door.

The corrective actions include the following:

1. As high internal panel temperatures are suspected to cause switch setpoint drift the feasibility of installing louvers in the RWC steam leak detection panel to lower the panel internal ambient temperatures will be investigated.
2. The recommendations of General Electric Service Information Letter (SIL) No. 443, "Riley Temperature Switch Improvements" will be reviewed to determine if the changes recommended will improve the Riley Temperature Switches' performance.
3. Replace the RWC heat exchanger high outlet temperature switch as this switch is close to its end of life.
4. Permanently attached signs on the doors leading to the control room back panel area which read "NO RADIO OPERATION IN THIS AREA".
5. Performing an engineering evaluation to determine if the temperature elements located right inside the RWC heat exchanger room can be relocated and the plastic which is presently installed over the RWC heat exchanger room door be removed.

These events are being reported in accordance with 10CFR50.73(a)(2)(iv).

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Duane Arnold Energy Center (DAEC)	05000331	87	024	00	02	OF	05

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

From July 25, 1987 through August 4, 1987 the Reactor Water Cleanup (RWCU) System (EIIS System Code Identifier CE) Steam Leak Detection Logic isolated the RWCU System six times.

The RWCU system steam leak detection logic consists of six temperature differential switches. These switches receive inputs from twelve temperature sensing elements which monitor temperatures in close proximity to inlet and outlet ventilation flow paths in areas containing RWCU equipment. Any of these differential switches reaching their setpoint results in automatic isolation of the RWCU system from the reactor. In addition to the differential switches, the RWCU leak detection system also uses six RWCU room ambient air temperature sensing elements, high differential flow indicators in the RWCU Piping, and non-regenerative heat exchanger high outlet temperature indication. The six differential temperature switches and six ambient temperature sensing elements are evenly divided between the inboard (MO2700) and outboard (MO2701 and MO2740) isolation logics. The non-regenerative heat exchanger high outlet temperature inputs to the outboard isolation logic, while the high differential flow isolation will isolate both inboard and outboard logics.

Following is a description of each event:

1. On July 25, 1987 at 1907 hours with the plant operating at 93% power, the "Steam Leak Detection Sys Ambient Hi Temperature" annunciator was received. Concurrent with this annunciator the RWCU Inboard Isolation Valve (MO2700) isolated as designed. Personnel sent to investigate the RWCU heat exchanger and pump rooms found no system leakage. Operators checking the steam leak detection panel found an ambient RWCU room temperature switch (CE-TS2742C, Riley Panalarm Model No. 86PTGF) reading 108 Degrees Farenheit. The switch is set to trip at 130 Degrees Farenheit. The intermediate cause of the RWCU isolation was determined to be the trip setpoint of TS2742C drifting conservatively low. The setpoint drifting problems can be associated with overheating of these Riley Panalarms temperature switches as Riley Panalarm personnel who were contacted indicated that overheating could cause setpoint drift. Maintenance personnel have stated that these Riley temperature switches are too hot to handle when removing them from their plastic cases. As immediate corrective action, the temperature switch was recalibrated and the setpoint returned to its designed setting. The RWCU system was then returned to service at 0612 hours on July 26. As a long term corrective action, the feasibility of installing louvers in the RWCU steam leak detection panel to lower the panel internal ambient temperatures will be investigated. The recommendations of General Electric Service Information Letter (SIL) No. 443, "Riley Temperature Switch Improvements" will be reviewed to determine if the changes recommended will improve the Riley temperature switches' performance and improve the RWCU system reliability.

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2. On July 26, 1987 at 0628 hours with the plant operating at 87% power, the "Cleanup System Filter Demin Trouble" annunciator was received. Along with this annunciator, M02701 (RWCU Outboard Isolation Valve), and M02740 (RWCU Return Isolation Valve) isolated as designed. The isolation occurred when operators were returning the RWCU system to service following the isolation on July 25, 1987. The temperature isolation bypass switch (TIS2722) for the non-regenerative heat exchanger high outlet temperature was being returned to the normal position when the isolation occurred. Local indication revealed the system isolated with TIS2722 (Fenwal Inc. Model No. 56100-1) indicating 120 Degrees Fahrenheit. This switch is set to trip at 140 Degrees Fahrenheit. As corrective action, the switch was bypassed as this switch is not required by Technical Specifications. The RWCU system was returned to service at 0840 hours. The intermediate cause of the system isolation was a spurious electrical signal generated while returning TIS2722 to service. The root cause is unknown. Maintenance personnel had requested a new switch be ordered as this switch is difficult to calibrate and set. A new switch has been ordered and will be installed during a future scheduled RWCU system maintenance evolution.

3. On July 27, 1987 at 1344 hours with the plant operating at 98% power, the "Steam Leak Detection Sys Hi Differential Temperature", and "Steam Leak Detection Sys Ambient Hi Temperature" annunciators were received momentarily. Concurrent with these annunciators M02700 (RWCU Inboard Isolation Valve) isolated as designed. Operators checking the steam leak detection panel found that no temperature switch isolation signals were present. The RWCU heat exchanger and pump rooms were inspected with no signs of leakage detected. The intermediate cause of the RWCU isolation was a steam leak detection logic initiation due to a spurious electrical signal. The root cause is unknown. As stated in response to isolation No. 1, the feasibility of installing louvers in the RWCU steam leak detection panel to lower the internal panel ambient temperatures will be investigated. In addition, the recommendations of General Electric SIL No. 443 "Riley Temperature Switch Improvements" will be reviewed to determine if the changes recommended will improve the switches' performance and improve the RWCU system reliability.

4. On July 28, 1987 at 1903 hours with the plant operating at 87% power, the "B" steam leak detection logic for the RWCU system received an isolation signal when the non-regenerative heat exchanger outlet high temperature switch was returned to its normal position following maintenance activities. M02701 (RWCU Outboard Isolation Valve), and M02740 (RWCU Return Isolation Valve) isolated as designed. Maintenance on this switch was being performed in response to the RWCU system isolation on July 26. The Corrective Maintenance Action Request (CMAR) had identified that a RWCU isolation was a potential consequence of restoring TIS2722 to service, and operations personnel were clearly aware of the

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potential for isolation. After discussions with DAEC Plant Management it was determined that this event should be reported. The intermediate cause of the event was determined to be a spurious electrical signal generated when TIS2722 was returned to service. The RWCU system was returned to service at 1958 hours. As stated in response to isolation No. 2, due to recurring problems with this switch, it will be changed out with a new model during a future scheduled RWCU system maintenance evolution.

5. On July 31, 1987 at 0950 hours with the plant operating at 94% power, the "Steam Detection System Hi Differential Temperature" annunciator was received and cleared several times in a short time period. Concurrent with this annunciator MO2700 (RWCU Inboard Isolation Valve) isolated as designed. Operators checking the steam leak detection panel found an engineer in the general area performing feedwater heater tests using a hand held radio. The RWCU heat exchanger and pump rooms were checked and no leakage was found. The intermediate cause of the isolation was a spurious electrical signal induced in the steam leak detection logic while the engineer was keying the hand radio. The root cause of the event was lack of administrative controls in assuring that radio operation does not take place by sensitive electrical equipment. Signs which read "NO RADIO OPERATION IN THIS AREA" had been previously attached to doors which lead to the back panels. At the time this event occurred the signs were not attached to the doors and the engineer was not alerted to the restriction of hand held radio operation in the Control Room back panel areas. Following the isolation these signs were permanently attached to the doors. The RWCU system was returned to service at 2114 hours.

6. On August 4, 1987 at 0430 hours with the plant operating at 99% power, the "Steam Leak Detection Sys Hi Differential Temperature" annunciator was received. At the same time MO2700 (RWCU Inboard Isolation Valve) isolated as designed. Operators checking the RWCU heat exchanger room found no sign of actual system leakage but did note the ambient temperature right inside the door was relatively cool. Operators checking the steam leak detection panel found a RWCU heat exchanger room differential temperature switch (TDS2743E, Riley Panalarm Model No. 86VTFF) reading right at its setpoint of 30 Degrees Fahrenheit. This switch receives one-half of its input from a temperature element located right inside the doors entry area. The cause of the event appears to be the removal of a plastic covering which was on the RWCU heat exchanger room door ventilation louvers. This plastic was installed because operating experience has shown that the area near the door is cooler when the ventilation louver is open and RWCU isolations can occur due to these normal ambient temperature differences. A special test was performed in March, 1987 to determine if the plastic could be removed. After reviewing the results of the test it was determined that the plastic could be removed. The plastic was removed on July 27, 1987. It is

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believed that no isolations occurred between July 27 through August 3 due to the unusually high ambient outside temperatures. These high day time temperatures did not significantly reduce during the evening so the reactor building temperatures remained elevated. In the early morning hours on August 4, 1987 ambient outside temperatures dropped significantly. This caused reactor building temperatures to drop significantly, RWCU heat exchanger door entry way temperatures to drop, and hence a RWCU isolation to occur. As immediate corrective action the plastic was reinstalled on the door and the RWCU system returned to service at 1035 hours. As a long term corrective action an engineering evaluation is being performed to determine if the temperature elements located inside the RWCU heat exchanger room door entry way can be relocated and the plastic permanently removed.

Throughout all these isolations all safety related equipment responded as designed. The RWCU system is used to remove impurities from the reactor water, reduce secondary sources of beta and gamma radiation by the removal of corrosive impurities, and to drain excess reactor water during certain operational modes. The only safety related function associated with the RWCU system is the primary containment isolation function. The RWCU system is not needed to safely shut the plant down, nor is it needed to keep the plant safely shutdown. Therefore these events had no affect on the health and safety of the public or the safe operation of the plant.

A review of past LERs (1984 to present) reveals that RWCU isolations have not occurred due to temperature switch setpoints drifting low, or returning TIS2722 to service. In July, 1985 a one second time delay was installed into the steam leak detection logic to alleviate the history of spurious RWCU isolations. The RWCU isolations reported in this LER are the first spurious isolations since the placement of the one second time delay.

These events are being reported in accordance with 10CFR50.73(a)(2)(iv).

Iowa Electric Light and Power Company

August 24, 1987
DAEC-87-0871

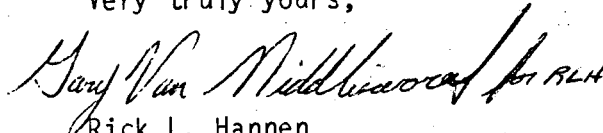
U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Subject: Duane Arnold Energy Center
Docket No. 50-331
Op. License DPR-49
Licensee Event Report No. 87-024

Gentlemen:

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

Very truly yours,



Rick L. Hannen
Plant Superintendent - Nuclear

RLH/BNT/go

Attachment - LER 87-024

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

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