

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 88060701 DOC. DATE: 88/06/01 NUCLEARIZED: NO DOCKET #
 FACIL: 50-305 Kewaunee Nuclear Power Plant, Wisconsin Public Service 05000205
 AUTH. NAME AUTHOR AFFILIATION
 LOHMAN, D. C. Wisconsin Public Service Corp.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-006-00: on 880502: plant experienced reactor/turbine
 trip, while operating. Caused by equipment failure. Wires
 identified replaced & setpoint calculator reinstalled. W/
 880601 ltr.

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

NOTES:

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NRR/DEST/ADS 7E	1 0	NRR/DEST/CEB 8H	1 1
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NRR/DEST/MEB 9H	1 1	NRR/DEST/MTB 9H	1 1
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NRR/DRIS/SIB 9A	1 1	NUDOCS-ABSTRACT	1 1
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Kewaunee Nuclear Power Plant										DOCKET NUMBER (2) 0 5 0 0 0 3 1 0 1 5										PAGE 15 1 OF 0 4									
TITLE (4) Spurious Over Temperature Delta Temperature Trip Signal in Conjunction With Monthly Surveillance of Nuclear Instrumentation Causes Reactor Trip																													
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 (S)					
																		N/A						0 5 0 0 0					
0 5		0 2		8 8		8 8		0 0 6		0 0 6		0 1		8 8								0 5 0 0 0							
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)		1 0 0		20.402(b)						20.402(a)						X 80.73(a)(2)(iv)						73.71(b)							
				20.402(a)(1)(i)						80.20(a)(1)						80.73(a)(2)(v)						73.71(c)							
				20.402(a)(1)(ii)						80.20(a)(2)						20.73(a)(2)(vi)						OTHER (Specify in Abstract below and in Text, NRC Form 305A)							
				20.402(a)(1)(iii)						80.73(a)(2)(i)						80.73(a)(2)(vii)(A)													
				20.402(a)(1)(iv)						80.73(a)(2)(ii)						80.73(a)(2)(vii)(B)													
				20.402(a)(1)(v)						20.73(a)(2)(iii)						80.73(a)(2)(iii)													
LICENSEE CONTACT FOR THIS LER (12)																													
NAME David C. Lohman - Plant Reactor Supervisor																TELEPHONE NUMBER AREA CODE 4 1 4 3 8 8 1 - 2 5 1 6 0													
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																													
CAUSE		SYSTEM		COMPONENT		MANUFACTURER		REPORTABLE TO NRC				CAUSE		SYSTEM		COMPONENT		MANUFACTURER		REPORTABLE TO NRC									
X		JIC		C10IM		PF1		8 1 0		Y																			
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 fifteen single space typewritten lines) (18)

At 1124 on May 2, 1988, with the plant operating at 100% power the plant experienced a reactor/turbine trip. A spurious trip signal on the Channel IV Overtemperature Delta Temperature (OTAT) trip circuitry in conjunction with the OTAT function for channel I being tripped for performance of a monthly instrument check caused the reactor/turbine trip.

The monthly surveillance procedure SP 48-003E, Nuclear Power Range N41 Instrument Channel Test at >10% Power, requires that the reactor protection related to N41 be placed in a tripped condition. This included the channel I OTAT reactor trip. Faulty wires in the Channel IV OTAT setpoint calculator made an intermittent connection causing the setpoint to spike. When the setpoint dropped below the Channel IV ΔT value, which had remained constant, the 2 of 4 logic for OTAT trip was made. This resulted in a reactor/turbine trip.

The root cause of the event was an equipment failure. The Foxboro box for the Channel IV OTAT setpoint calculator had an intermittent connection between its connector plug and an internal circuit board due to faulty wires. Had other reactor protection system testing not been in progress this failure would not have resulted in a reactor trip.

The wires identified as faulty were replaced and the setpoint calculator was reinstalled. A strip chart recorder was mounted locally and was checked periodically for several days following the plant's restart to verify the box was functioning correctly.

This event is being reported as required by 10 CFR 50.73(a)(2)(iv).

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LICENSE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 05000305	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		88	006	00	02	OF	04

TEXT (If more space is required, use additional NRC Form 388A's) (17)

Description of the Event

On May 2, 1988, at 1124, with the plant operating at 100% power the plant experienced a reactor [RCT]/turbine [TRB] trip. A spurious trip signal on the channel [CHA] IV Overtemperature Delta Temperature (OTAT) trip circuitry in conjunction with the channel I OTAT being tripped for the performance of a monthly instrument check caused the reactor/turbine trip.

At 1035 on May 2, 1988, a monthly surveillance procedure on the N41 Power Range channel was initiated. Surveillance procedure SP 48-DD3E, Nuclear Power Range N41 Instrument Channel Test at >10% Power, requires the channel I reactor protection related to N41 be placed in a tripped condition. This included the Channel I OTAT reactor trip circuitry.

OTAT provides protection for the reactor coolant system [AB] from departure from nucleate boiling. There are 4 channels of OTAT protection, one for each ΔT channel. A reactor trip is initiated when 2 of the 4 ΔT channels exceed their associated OTAT setpoints.

The OTAT setpoint has inputs from several plant indicators. They are reactor coolant system average temperature, pressurizer [PZR] pressure, and the upper and lower power range (PR) detector [DET]. The OTAT trip circuitry is tripped during the performance of surveillance on the PR because of the upper and lower detector inputs.

At 1124 the OTAT setpoint on Channel IV dropped below the ΔT value for that channel. The ΔT for Channel IV remained constant. This, in conjunction with Channel I being tripped for the monthly surveillance, made up the 2 of 4 logic causing a reactor/turbine trip. All plant systems responded to the trip as designed.

However, intermediate range N35 did remain upscale due to under compensation. This required the operator to manually unblock the source range detectors.

The operators followed the appropriate procedures for plant stabilization. The NRC was notified as required by 10 CFR 50.72(b)(2)(ii) at 1450.

The plant was held at hot shutdown while a post trip review was performed. Investigation by the Plant Instrument and Control group found faulty connections in the wires from the plug on the channel IV penalty calculator box to its circuit board. The spiking setpoint was recreated by physical movement of these wires. Repairs were initiated on the affected box.

At 1252, N41 and its associated trips were returned to service. The reactor was made critical at 1548. The channel IV OTAT setpoint calculator was repaired and returned to service at 1715. The plant was reconnected to the grid at 1836.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		8 8	— 0 1 0 6	— 0 0	0 3	OF 0 4

TEXT (If more space is required, use additional NRC Form 388A's) (17)

Cause of Event

The root cause of the event was equipment failure. Faulty wires in the channel IV Foxboro setpoint calculator box TM404B made an intermittent connection causing spiking. During the post trip review additional indication of Channel IV OTAT setpoint erratic behavior was found. The setpoint had spiked high at 1120, approximately 4 minutes before the reactor trip. This was discovered in the review of the plant process computer logs. The review indicated that prior to 1120 there were no instances of channel IV OTAT setpoint fluctuations; therefore, the operators had no forewarning of a potential problem.

A strip chart recorder was connected locally and erratic behavior was observed when moving the wires in question. After replacement of the wires this behavior could not be recreated.

It is felt that the faulty wires may have been due to age or were damaged during the shipment of this box from Foxboro following refurbishment during the recently completed 1988 refueling outage.

Had other testing not been in progress, this failure would not have resulted in a reactor trip. The erratic behavior of the setpoint would have been detected by the operators through the alarm associated with this function when it failed low or during periodic monitoring of control board indications.

Analysis of Event

This event is being reported per 10 CFR 50.73 (a)(2)(iv) as an actuation of the reactor protection system and engineered safety features.

Plant operators followed the appropriate procedures and stabilized the plant. All plant systems responded as designed except for Intermediate Range nuclear flux detector N35 which remained upscale following the trip due to undercompensation. This required the operator to manually unblock the source ranges. Both reactor trip breakers opened, the turbine stop valves closed and the reactor was shutdown. Main feedwater regulating valves closed and the auxiliary feedwater pumps started.

Both steam generators were available throughout the event. Both emergency diesel generators started as required, although off-site power was available throughout the event. There was no impact on the health and safety of the public.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 0 5 8 8 - 0 1 0 6 - 0 1 0 0 1 4 OF 0 1 4	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

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

Corrective Actions

The wires that were identified as faulty during the post trip investigation were replaced. The setpoint calculator was reinstalled in the system with a strip chart monitoring its output. The strip chart was reviewed periodically for several days following the plant restart to verify the box was functioning properly.

This was determined to be an isolated event; therefore, further corrective actions are not necessary.

Similar Events

None.

Equipment Failure

The OTAT setpoint calculator was supplied by Foxboro. The calculator is a model 66RC-OL, Electronic Consotrol Dynamic Compensator.

WPSC (414) 433-1598
TELECOPIER (414) 433-1297

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600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

June 1, 1988

10 CFR 50.73

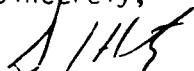
U. S. Nuclear Regulatory Commission
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Washington, D.C. 20555

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 88-006-00

The attached Licensee Event Report for reportable occurrence 88-006-00 is being submitted in accordance with the requirements of 10 CFR 50.73, "Licensee Event Report System."

Sincerely,



D. C. Hintz
Vice President - Nuclear Power

TJW/jms

Attach.

cc - INPO Records Center
Mr. Robert Nelson
US NRC, Region III

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