

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0 3 0 5	PAGE (3) 1 OF 0 4
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TITLE (4)
Inadvertant Actuation of Train B Containment Spray

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)							
0	1	2	8	5		0	0	1				0	5	0	0	0		
0	1	2	8	5		0	0	2	2	1	8	5						

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 1 0	20.402(b)		20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)		73.71(b)				
	20.406(a)(1)(i)		50.38(e)(1)		50.73(a)(2)(v)		73.71(c)				
	20.406(a)(1)(ii)		50.38(e)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 365A)				
	20.406(a)(1)(iii)	<input checked="" type="checkbox"/>	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)						
	20.406(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)						
20.406(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)

NAME Richard P. Pulec, Plant Technical Supervisor	TELEPHONE NUMBER
	AREA CODE: 4 1 4 3 8 8 - 2 5 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	B	E I S	F 1 8 0	YES					

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15) N/A	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

At 1437 on January 22, 1985, during full power operation, there was an inadvertent actuation of the 1B Internal Containment Spray System. The 1B pump ran for 1 minute and 40 seconds discharging an estimated 2500 gallons of borated water into the containment building before being secured. The pump start occurred during the performance of SP55-155, "Engineered Safeguards Logic Test".

When the pump start occurred, the operator verified that it was inadvertent, secured the system and reset containment spray. The operators received various battery ground alarms as a result of instrument malfunctions in containment.

At 1525 it was discovered that the RWST level was below technical specification limits, refilling was started and preparations were made to begin a plant power reduction. The TWST level was above TS setpoint at 1555 hence no reduction in power was initiated.

Immediate actions were taken to assess the situation and identify the cause. Long term actions planned are to clean the containment interior, and perform an evaluation to identify potential hardware modifications which would prevent reoccurrence.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

TEXT (If more space is required, use additional NRC Form 365A's) (17)

At 1437 on January 22, 1985, during full power operation, there was an inadvertent actuation of the 1B Internal Containment Spray System [ICS] (BE). The 1B pump (P) ran for 1 minute and 40 seconds discharging an estimated 2500 gallons of borated water into the containment building before being secured. The pump start occurred during the performance of SP55-155 "Engineered Safeguards Logic Test". This test is performed monthly to satisfy plant Technical Specification requirements.

Each safeguards logic train is tested individually. A contact is opened to prevent the slave relay on the train in test from being energized by the master relay. By procedure the I & C personnel are to monitor the computer printout, the sequence of events recorder points, annunciators and/or trip status lights and the test lamps or permissive status lights actuated by the procedure.

When the pump start occurred the operator verified that it was inadvertent, secured the system and reset containment spray. The operators received battery ground alarms (ALM) as a result of instrument malfunctions in containment. Among the alarms received were 1A RCP fire protection, 1B RCP upper bearing temperature, and rod deviation alarms.

At 1525 it was discovered that the Refueling Water Storage Tank (BQ) level was below Technical Specification limits. Refilling was started and preparations were made to begin a plant power reduction. The RWST was above TS setpoint at 1555 hence no reduction in power was initiated.

AT 1610 a containment entry was made by Operations personnel and plant electricians. They found pools of water at all elevations of containment that were evaporating and leaving boric acid residue. Everything else appeared normal with no visible evidence of ground faults.

At 1742 the operators completed SP87-125 "Shift Turnover Channel Checks". All of the parameters were normal and within specification. The only abnormal conditions at that time were battery grounds of 60 volts negative on "B" battery, 120 volts positive on "A" battery, a 1A RCP fire alarm which was shown to be invalid during the visual inspection, a high containment humidity indication, a mid-position indication of the emergency airlock inner door switch, and an abnormal RCP upper Radial BRG temperature indication. The last two abnormal conditions were due to water intrusion.

At 2040, indication for control rod (AA) K-7 in Bank D began behaving erratically. All other core conditions showed normal behavior and the rod position indication for rod K-7 was declared out of service.

A review of the surveillance procedure performance was initiated to identify the cause of the actuation. From the Sequence of Events Recorder printout, it was discovered that during the performance of the containment Hi pressure logic testing, the Hi-Hi containment pressure alarm actuated twice. This Hi-Hi containment pressure bistable (IS) actuation during the test on the Hi containment pressure logic is attributed to an interaction between the two bistables, referred to as cross-talk. This is possible because the Hi and the Hi-Hi containment pressure actuation circuitry are contained in the same duplex bistable unit. The problem of cross-talk has been detected before and

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Kewaunee Nuclear Power Plant	DOCKET NUMBER (2) 0 5 0 0 0	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 365A's) (17)

has been the subject of letters between WPS and the bistable manufacturer, Foxboro. This cross-talk may have resulted in energizing the Containment Spray Master Relay (RLY). At the end of the procedure, when safety injection was reset, the slave relay was energized and the 1B ICS pump actuated.

A retest was performed two days after the event in an attempt to reproduce the occurrence. In two of seventeen attempts Hi-Hi containment pressure alarmed during testing of the Hi containment pressure channel. In addition, recorders were set up to monitor the coils on the bistable outputs. Fluttering of the de-energized bistable was observed. This evidence indicates that cross-talk may have occurred, but is not conclusive as to the cause of the pump start. Additional testing is planned during the in-progress 1985 refueling outage.

A related event occurred on February 10, with the plant in cold shutdown and RCS pressure at approximately 320 psig. The control room operator noticed that the 1B Reactor Coolant Pump (AB) had started without switch action. Upon discovery the operator secured the pump and started the associated oil lift pump. Residual water (believed to be from the ICS actuation) discovered in the pump pressure switch housing had grounded the RCP 4160V breaker SCR circuitry sending a close signal to the breaker and starting the pump. (Reference LER 85-04).

CORRECTIVE ACTIONS

The following actions were taken:

- 1) The NSSS vendor (Westinghouse) and the A/E (Fluor Engineers) were contacted immediately to aid in the evaluation of the incident. The effects of the spray on equipment operability and potential for Boric Acid and NaOH corrosion of metal components was considered. The decision was made to remain at full power.
- 2) Chemistry samples were taken to determine the amount of caustic discharged to containment. The results were a PH of 6.8 in the spray discharge line and a PH of 5.9 in the Refueling Water Storage Tank.
- 3) The Operations Superintendent routed a letter to the operating crews alerting them to potential problem areas based on conversations with Westinghouse. These areas are: the reactor coolant pumps, nuclear instrumentation, individual rod position indication and limit switch indication.
- 4) A valve timing test was performed on the air operated containment isolation valves within containment. All were within specification.
- 5) The following day the 1B ICS piping was flushed to remove caustic in the system and the lines were sampled to ensure the caustic was flushed.
- 6) A core flux map was performed which confirmed that control rod K-7 was at its normal bank position.

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

TEXT (If more space is required, use additional NRC Form 365A's) (17)

- 7) On January 24, the Safeguards Logic Test was repeated to aid in identifying the cause of the pump start. The results were not conclusive.
- 8) Our initial review of the RCP start (breakaway measurements, vibration measurements, and thrust bearing temperatures) indicated that no damage occurred. (Reference LER 85-04).

Long term actions planned are:

- 1) Cleanup the residual boric acid crystals.
- 2) Perform further testing on the safeguards actuation logic during refueling.
- 3) Monitor reactor coolant pump performance during startup.
- 4) Investigate replacing the duplex bistables used in the energize to actuate applications.
- 5) Perform a random check on insulated carbon steel lines inside containment to ensure no boric acid is on the piping.

SAFETY CONSEQUENCES

The immediate concerns following this event were proper operation of equipment. The containment tour verified that there was no major problems and abnormal instrument indications could be attributed to water intrusion.

The other concern was possible corrosion of carbon steel components covered by mineral based insulation material when exposed to boric acid solution. According to information received from Westinghouse, when the solution evaporates boric acid crystals are left; as long as the crystals remain unwetted there should be no short or medium term corrosion concern. However, because of the design of the insulation and the high operating temperature of the carbon steel components it is unlikely that the solution came in contact with the components.

Containment humidity returned to normal conditions, (the 15-20 percent range) by 1937 on January 22 indicating that the water inside containment looked dry, with boric acid crystals coating exposed surfaces.

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, WI 54305



February 21, 1985

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

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Reportable Occurrence 85-001-00

In accordance with the requirements of 10 CFR 50.73 "Licensee Event Report System", the attached Licensee Event Report for reportable occurrence 85-001-00 is being submitted.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Carl Hintz", with a flourish underneath.

D. C. Hintz
Manager - Nuclear Power

JGT/js

Attach.

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