

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Pilgrim Nuclear Power Station - Unit No. 1 DOCKET NUMBER (2) 0 5 0 0 0 2 9 3 PAGE (3) 1 OF 0 3

TITLE (4) Reactor Scram due to Pressure Switch Sensitivity

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	1	6	8	6	8	6	0	0	2	0	5	0	0	0
0	1	1	6	8	6	8	6	0	0	2	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)	20.406(e)	X	80.73(a)(2)(iv)	73.71(b)						
	20.406(a)(1)(i)	80.38(e)(1)		80.73(a)(2)(v)	73.71(e)						
	20.406(a)(1)(ii)	80.38(e)(2)		80.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 369A)						
	20.406(a)(1)(iii)	80.73(a)(2)(i)		80.73(a)(2)(viii)(A)							
	20.406(a)(1)(iv)	80.73(a)(2)(ii)		80.73(a)(2)(viii)(B)							
	20.406(a)(1)(v)	80.73(a)(2)(iii)		80.73(a)(2)(ix)							

LICENSEE CONTACT FOR THIS LER (12)  
NAME Paul J. Hamilton - Sr. Plant Engineer TELEPHONE NUMBER 6 1 7 7 4 6 - 7 9 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	
X	J	C	6 3	B 0 6 9	Y					

SUPPLEMENTAL REPORT EXPECTED (14) YES (If yes, complete EXPECTED SUBMISSION DATE) X NO EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

On 1/16/86 an unplanned reactor scram occurred from 100% power at 2246 hours. The scram was caused by a false high reactor pressure signal. The event occurred with the unit in a half scram configuration required for maintenance changeout of a Barksdale reactor high pressure switch (A channel). While changing out the switch a second reactor high pressure switch in the B channel was lightly bumped. Cause of the scram is believed to be hypersensitivity of the switches to vibration. Root cause of the instrument sensitivity is possibly related to recently installed HFA, "Century Series" relays in the reactor protection system circuitry. Preliminary tests indicate that the dropout (actuation) voltage of the new relays is higher than the old relays and may be contributing to sensitivity.

Testing indicated that the switches were very sensitive to light taps (e.g. would trip when lightly tapped with a screwdriver). The testing also indicated that the closer reactor pressure was to the trip setpoint, the more likely the switch was to trip when lightly tapped.

In response to these conclusions, corrective action was taken to raise the high pressure setpoint from 1080 to 1087 psig (including a 12 psig water leg) and wrap the sensing lines to the affected switches with foam insulation.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   6	-   0   0   2	-   0   0	0   2	OF	0   3

TEXT (If more space is required, use additional NRC Form 305A's) (17)

On 1/16/86, an unplanned reactor scram from 100% power occurred at 2246 hours. The scram was caused by a false high reactor pressure signal. At the time of the event a planned half scram was in on the "A2" channel of the reactor protection system (RPS) to facilitate changeout of reactor high pressure switch 263-55C. The full scram occurred when reactor high pressure switch 263-55D, in the "B2" RPS channel, initiated a false high pressure signal. The switches are Barksdale Model #B2T-A125S.

Earlier that day, at approximately 1230 hours, an unplanned half scram occurred in the "A2" RPS channel during a routine surveillance test. The half scram occurred while technicians were opening a junction box. Investigation by maintenance technicians revealed that gentle taps on the case of pressure switch 263-55C resulted in a half scram signal. The switch was checked and found to be within calibration at 1080 psig.

Troubleshooting of the half scram continued and at approximately 1630 hours the possibility of a worn microswitch within PS263-55C was ruled out as a possible cause when utilization of the second spare microswitch did not resolve the sensitivity of the switch to gentle taps. The decision was then made to change out 263-55C. At 2246 hours, the channel B high pressure logic actuated when switch 263-55D mounted adjacent to 263-55C, initiated a false high reactor pressure signal. This completed the logic required for a full scram. The false signal was from vibration picked up when technicians were in contact with the rack while cautiously removing the cover bolts of switch 263-55C.

The two switches 263-55C (channel A2) and 263-55D (channel B2) are located on the same instrument rack (2206) within 12 inches of one another. When questioned, the responsible technician stated that while demounting 263-55C, switch 263-55D was lightly bumped. The cause of this event is believed to be hypersensitivity of the switches to vibration. Root cause of the sensitivity is possibly related to new HFA General Electric "Century Series" relays which were installed in the RPS circuitry during the 1984 refueling outage. Preliminary testing has shown that the new relays drop out (e.g. actuation) voltage is higher than the old relays and may be contributing to an overall increase in the sensitivity of the circuit.

Additional testing indicated that the 263-55C replacement switch and 263-55D were both very sensitive to the slightest amount of contact in and around the rack or sensing line, (e.g. would trip when lightly tapped with a screwdriver).

Laboratory bench tests on similar Barksdale switches were conducted in an attempt to determine cause. The tests concluded that the closer simulated reactor pressure was to the trip setpoint, the more likely the switch was to actuate when lightly tapped.

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

In response to these conclusions, corrective action (Ref. TM 86-02) was to raise the high pressure setpoint of the reactor high pressure switches from 1080 to 1087 psig (including a 12 psig water leg). Discounting the water leg the actual setpoint was raised from 1068 to 1075 psig. In addition, the sensing lines to the affected pressure switches were wrapped with foam insulation to make them less sensitive to vibration from inadvertant contact. These actions were also taken for the redundant switches on the instrument rack (2205) which were also found to be hypersensitive to light taps.

The safety consequences of this event are negligible since the scram sequence was normal and because the sensitivity of the switches was in a conservative direction. Subsequent to completion of corrective action the unit was synchronized to the grid on 1/18/86, at approximately 1252 hours. A search of LER records identified no previous events of a similar nature. The EIIS system and component codes are JC and 63 respectively.

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WILLIAM D. HARRINGTON  
SENIOR VICE PRESIDENT  
NUCLEAR

February 18, 1986  
BECO Ltr. #86-015

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Washington, D.C. 20555

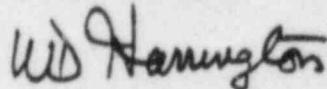
Docket Number  
License No. DPR-35

Dear Sir:

The attached Licensee Event Report 86-002-00, "Reactor Scram Due to Pressure Switch Sensitivity", is hereby submitted in accordance with the requirements of 10CFR50.73.

If there are any questions on this subject, please do not hesitate to contact me.

Respectfully submitted,



W. D. Harrington

PJH/keo

Enclosure: LER 86-002-00

cc: Dr. Thomas E. Murley  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
631 Park Avenue  
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