NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Perry Nuclear Power Plant, Unit 1	0 5 0 0 0 4 4 0	1 OF 0 3

TITLE (4)

Failure of Motor Driven Feedwater Pump Controller Results in Reactor Scram

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 5	2 7	8 7	8 7	— 0 3 7	— 0 0	0 6	2 6	8 7		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)							
POWER LEVEL (10)	0 5 8		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)
			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
Gregory A. Dunn, Compliance Engineer, Extension 6484	2 1 6 2 5 9 - 3 7 3 7

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
X	S J	L C	B 0 4 5	N					

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) (16)

On May 27, 1987, at 0547, a reactor scram occurred due to a reactor vessel water level of less than Level 3 (+177.7 inches above top of active fuel (TAF)). In response to the reactor scram, plant operators entered Off-Normal Instruction (ONI-C71), "Reactor Scram (Unit 1)," placed the mode switch in Shutdown, and tripped the main turbine. Reactor water level was restored using the B Turbine Driven Feedwater Pump (TDFP) in manual. The minimum reactor vessel water level reached during this event was +157 inches above TAF.

Troubleshooting subsequent to the scram located a failed resistor internal to the control circuit of the Motor Driven Feedwater Pump (MFP) which resulted in its flow control valves going closed, at 0546:58. With these valves shut, the MFP stopped supplying water to the reactor vessel. With only the B TDFP supplying water to the reactor vessel, a steam flow/feedwater flow mismatch developed that resulted in water level decreasing and causing the reactor scram.

The card containing this resistor was replaced, the control circuit was calibrated with the new card in place and the MFP controller was returned to service. Once this repair was performed, the transient analysis was completed and approval to restart was granted by the Plant Manager. The plant was restarted at 1454.

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

On May 27, 1987, at 0547, a reactor scram occurred due to a reactor vessel [RPV] water level of less than Level 3 (+177.7 inches above top of active fuel (TAF)). Prior to the event, the plant was in Operational Condition 1 (Power Operation) with reactor thermal power at approximately 58 percent of rated. Reactor coolant temperature was approximately 525 degrees and reactor vessel pressure was approximately 945 psig.

On May 27, the Motor Driven Feedwater Pump (MFP) [P] was supplying water to the reactor vessel in conjunction with the B Turbine Driven Feedwater Pump (TDFP). Both the TDFP and the MFP were in automatic and being controlled via the Master Level Controller [LC]. The MFP flow control valves [FCV] went closed, at 0546:58. With these valves shut, the MFP stopped supplying water to the reactor vessel. With only the TDFP supplying water to the reactor vessel, a steam flow/feedwater flow mismatch developed that resulted in reactor vessel water level decreasing. Level 4 (+197.1 inches above TAF) was reached within 10 seconds and resulted in a Reactor Recirculation [AD] flow control valve runback. When the runback occurred operations personnel responded by transferring the TDFP to manual and increased turbine speed to increase feedwater to the reactor vessel. Manual and automatic actions taken to decrease steam flow or increase feedwater flow were not sufficient to prevent the continuing reactor water level decrease. Approximately 20 seconds later, reactor water level reached Level 3 causing a reactor scram and a trip of the Reactor Recirculation system pumps to slow speed. These automatic actions were in accordance with plant design.

In response to the reactor scram, plant operators entered Off-Normal Instruction (ONI-C71), "Reactor Scram (Unit 1)," placed the mode switch in shutdown, and tripped the main turbine. The Reactor Core Isolation Cooling (RCIC) system was manually initiated in the Condensate Storage Tank (CST) [TK] to CST mode of operation in the event that another water supply would be needed. Reactor water level was restored using the B TDFP in manual. The minimum reactor vessel water level reached during this event was +157 inches above TAF.

Troubleshooting subsequent to the scram located a failed resistor internal to the Manual Unit card (Manufacturer: Bailey, Model Number: 722001AAAA1) of the control circuit of the MFP. The failure caused the output of the controller to command the MFP flow control valves to the full shut position. With the MFP still in automatic the logic circuitry for the Master Level Controller continued to proportion the output signal to the operating B TDFP and the MFP. This division of demand signal to one operating and one non-operating feedwater pump caused the continued mismatch between steam flow and feedwater flow resulting in decreasing reactor vessel level and the reactor scram.

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

The MFP and its associated flow control valves provide an alternative motive force (as opposed to the TDFPs) for injecting feedwater into the reactor vessel. When not in use it is placed in an automatic standby mode. The MFP and its flow control valves are non-safety class and perform no safety functions. FSAR Section 15.2.7 analyzed the loss of feedwater flow which results in a reactor scram at Level 3, and the trip of recirculation system and initiation of the RCIC and HPCS at Level 2. This event was within the boundaries of this analysis therefore, this event is not considered safety significant. No previous similar events have been identified.

The card with the failed resistor was replaced, the control circuit was calibrated with the new card in place and the MFP controller was returned to service. Once this repair was performed, the transient analysis was completed and approval to restart was granted by the Plant Manager. The plant was restarted, at 1454.

Energy Industry Identification System Codes are identified in the text as [XX].