CENTERIOR ENERGY

PERRY NUCLEAR POWER PLANT
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Michael D. Lyster
VICE PRESIDENT - NUCLEAR

October 9, 1992
PY-CEI/NRR-1558 L

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

Perry Nuclear Power Plant
Docket No. 50-440
LERs 92-017

Dear Sir:

Enclosed is Licensee Event Report 92-017 for the Perry Nuclear Power Plant.

Sincerely,

Frank R Stead for
Michael D. Lyster

MDL:CRE:ss

Enclosure: LER 92-017

cc: NRC Project Manager
NRC Sr. Resident Inspector
NRC Region III

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NRC FORM 366 (5.92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Perry Nuclear Power Plant, Unit 1	05000 440	1 OF 5

TITLE (4)
Reactor Scram Due to Reactor Feed Pump Turbine Lube Oil System Failure

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									NA	05000
09	10	92	92	017	00	10	09	92	FACILITY NAME: NA	DOCKET NUMBER: 05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	100	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)	X OTHER
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A) TS 3.5.1.g
		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 (Include Area Code)
Henry L. Hegrat, Compliance Supervisor, Extension 5185	(216) 259-3737

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
B	SL	FLT	X999	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 15 single-spaced typewritten lines) (16)

At 2107 hours on September 10, 1992 a full Reactor Protection System (RPS) scram occurred due to reactor water level reaching the level 3 setpoint of 178 inches. The low reactor water level condition resulted from closure of the "B" Reactor Feed Pump Turbine (RFPT) control valves following a loss of hydraulic oil pressure from the RFPT lube oil system. The loss of hydraulic pressure was due to oil leaking by the gasket for RFPT B servo valve filter. It was determined that the oil pressure did not drop low enough to indicate a RFPT trip, which would have initiated a Motor Feed Pump (MFP) auto-start and a Reactor Recirculation System Flow Control Valve runback, but was low enough to allow closure of the RFPT control valves. The leaking gasket was believed to be the result of improper reassembly during periodic filter replacement during a recent refueling outage.

The filter gasket was inspected and showed no evidence of a material defect. The gasket was subsequently replaced and proper reassembly of the filter assembly verified. Appropriate torque on the filter assembly retaining bolts was also verified for both RFPT trains.

Submittal of this report also meets the requirements for Technical Specification 3.5.1, Action g. which requires a Special Report following any Emergency Core Cooling System actuation and injection into the Reactor Coolant System.

I. Introduction

At 2107 hours on September 10, 1992, a full Reactor Protection System (RPS) [JC] scram occurred due to reactor water level reaching the Level 3 setpoint of 178 inches. Prior to the event the plant was operating at 100 percent power with reactor pressure at 1020 psi and saturated conditions. The reactor scram, the consequent Emergency Core Cooling System (ECCS) discharge to the reactor vessel, and Engineered Safety Features (ESF) actuations are being reported pursuant to the requirements of 10 CFR 50.73(a)(2)(iv). Appropriate one hour and four hour non-emergency NRC notifications were made at 2134 hours on September 10 and 0040 hours on September 11, 1992 respectively, pursuant to the reporting requirements of 10 CFR 50.72(b)(1)(iv), 50.72(b)(2)(ii) and 50.72(b)(2)(vi). An Unusual Event was declared at 2117 hours on September 10 due to the initiation of ECCS with flow to the reactor vessel and was reported under 10 CFR 50.72(a)(1)(i) concurrent with the previously referenced one hour notification. Additional required notifications were made within the required time limits.

Submittal of this report also meets the requirements for Technical Specification 3.5.1, Action g. which requires a Special Report following any ECCS actuation and injection into the Reactor Coolant System. This was the fifth High Pressure Core Spray injection cycle to date. The injection nozzle usage factor is currently less than .70.

II. Description of the Event

On September 10, 1992, the plant was operating at 100 percent power with no major evolutions in progress. At approximately 2107 hours an annunciator in the Control Room indicated low hydraulic oil pressure for Reactor Feed Pump Turbine (RFPT) [SJ] B. Control Room operators also noted oscillations in the RFPT B oil header pressure. Based upon indications of decreasing water level and indications that the control valves for RFPT B were closing, the Motor Feed Pump (MFP) [SJ] was manually started with reactor level between 185 and 190 inches.

Before the operators could reduce reactor power, reactor level reached the Level 3 setpoint of 178 inches, and a full reactor scram signal was received. Reactor water level continued to decrease after the scram due to void collapse and boil off. When reactor level decreased to the Level 2 setpoint of 129 inches, High Pressure Core Spray (HPCS) [BG], Reactor Core Isolation Cooling (RCIC) [BN] and a Balance of Plant (BOP) isolation were automatically initiated. Upon RCIC initiation at 2108 hours, the Main Turbine [TA] and RFPTs tripped per design. Reactor water level dropped to a transient low of 123 inches during the event, but recovered rapidly due to HPCS, RCIC, and MFP injecting water into the reactor vessel. At 2109 hours, reactor vessel level reached the Level 8 setpoint of 219 inches. Vessel level was subsequently stabilized and maintained below the

Level 8 setpoint. The Shift Supervisor declared an Unusual Event at 2117 hours, and plant operators then began a normal plant recovery in accordance with approved operating instructions. At 2247 hours, the previously declared Unusual Event was terminated.

III. Cause Analysis

The normal operating RFPT system pressure is 225 psig with a low pressure alarm set at 150 psig. When the hydraulic system perturbations began, the oil header pressure dropped low enough to allow the control valves for RFPT B to close and activate the RFPT B low hydraulic oil pressure alarm (150 psig), but not low enough to initiate a RFPT trip at the 75 psig setpoint. Consequently, the Feedwater Level Control System still sensed that two RFPTs were running. The MFP is normally aligned to automatically start if one RFPT trips (as sensed by hydraulic oil pressure less than 75 psig) when two are running to prevent a Level 3 scram or RCIC initiation. However, due to the nature of the initiating conditions which resulted in the Level 3 scram, the MFP was not started soon enough to terminate the reactor level transient prior to reaching 178 inches. Additionally, the RFPT trip signal is used in the Reactor Recirculation [AD] RPV Level 4 Flow Control Valve [FCV] Runback circuit. If the RFPT trip signal is received and RPV level decreases to 197 above the top of the active fuel (TAF) a Reactor Recirc FCV runback would normally be initiated to reduce reactor power. However, as described previously the oil pressure did not drop low enough to signal the RFPT trip.

The primary initiator for this event was the leaking filter [FLT] gasket in RFPT B hydraulic oil system. Inspection of the gasket after the event did not reveal evidence of a material defect. The gasket was found to be installed slightly off-center resulting in a slight deformation of the rubber gasket seating surface. A captive retaining bolt for the filter housing was also found to be loose in the area of the gasket deformation. Therefore, the cause of the leakage is believed to be the result of improper installation. The filter replacement task is considered to be a skill-of-the-craft activity that does not ordinarily require special instructions for completion.

IV. Safety Analysis

The purpose of the Feedwater System is to maintain reactor vessel water level within predetermined limits during all modes of plant operation. The system is designed to sustain 80 percent feedwater flow following a single RFPT trip by use of the remaining RFPT and the Motor Feed Pump. The Motor Feed Pump's primary function is to serve as an automatic source of feedwater following a loss of operating RFPTs in order to prevent a Level 3 scram or actuation of RCIC. With

the MFP control switch in Auto, the following signals will automatically start the MFP:

- o Loss of one running RFPT with both RFPTs running, as sensed by low hydraulic trip header pressure (less than 75 psig) associated with the lost RFPT and the remaining RFPT's Low Pressure Stop Valve open, or

- o Loss of both RFPTs as sensed by a loss of hydraulic trip header pressure (less than 75 psig) in both trip headers.

Due to the unique method of initiation for this event, the RFPT hydraulic oil pressure did not drop below the low pressure trip setpoint prior to reactor vessel level dropping below the Level 3 RPS scram setpoint and therefore the automatic MFP auto-start did not occur. However, the MFP was manually started prior to the reaching the Level 3 setpoint, thereby partially mitigating the severity of the RPV level transient. Reactor power was not reduced prior to the scram due to the short duration of the transient (approximately 15 seconds) and the lack of the Recirc Flow Control Valve Runback.

The loss of feedwater flow analysis from the Perry Updated Safety Analysis Report (USAR) assumes an initial reactor power level of 100 percent. No credit is taken for the availability of the MFP during the accident scenario. During the loss of feedwater flow transient which occurred on September 10, 1992, the HPCS and RCIC systems functioned as designed to recover the reactor water level Additional plant systems functioned as designed to maintain the plant in a safe condition. This event is therefore bounded by the existing safety analysis and is not considered to be safety significant.

V. Similar Events

There have been no previous similar events involving the loss of feedwater due to loss of hydraulic oil pressure.

VI. Corrective Actions

The oil filter gasket for the RFPT B servo valve was inspected for signs of damage after the event. After attributing the cause of the gasket failure to improper assembly, the remaining 3 RFPT servo valve filter assemblies were also inspected and reassembled. Proper torquing of the filter assembly captive retaining bolts and gasket placement were verified during the reassembly. Appropriate guidance was added to the Repetitive Task utilized for periodic filter replacements to preclude repetition of this event. Maintenance personnel who perform this task will be reminded of the requirements for ensuring proper

gasket placement and retaining bolt tightening in accordance with guidance contained in the generic torquing instruction.

Engineering personnel are evaluating the adequacy of the 75 psig low hydraulic oil pressure setpoint to determine if any modifications to the setpoint or system design are appropriate. Additionally all licensed and non-licensed operators will review this LER during requalification training.

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