



**CENTERIOR
ENERGY**

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United States Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
LER 97-006

Ladies and Gentlemen:

Enclosed is Licensee Event Report (LER) 97-006, "Technician Error Results in High Pressure Core Spray System Actuation Without Injection Into the Reactor Pressure Vessel."

If you have questions or require additional information, please contact Mr. Henry L. Hegrat, Manager - Regulatory Affairs, at (216) 280-5606.

Very truly yours,

Enclosure: LER 97-006

cc: NRC Region III Administrator
NRC Resident Inspector
NRC Project Manager

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LICENSEE EVENT REPORT (LER)

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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.

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TITLE (4)
Technician Error Results in High Pressure Core Spray System Actuation Without Injection Into The Reactor Pressure Vessel

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
06	10	97	97	006	00	07	09	97		05000
										05000

OPERATING MODE (9) 4

POWER LEVEL (10) 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)

20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)
20.2203(a)(1)	20.2203(a)(3)(i)	50.73(a)(2)(ii)	50.73(a)(2)(x)
20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71
20.2203(a)(2)(iii)	20.2203(a)(4)	x 50.73(a)(2)(iv)	OTHER
20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Todd A. Henderson, Supervisor-Compliance	TELEPHONE NUMBER (Include Area Code) (216) 280-5889
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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

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO	EXPECTED SUBMISSION	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On June 10, 1997, at 1831 hours, with the plant in Mode 4, a technician error occurred during the return of a reactor pressure vessel (RPV) water level instrument reference leg purge panel to service which resulted in an inadvertent High Pressure Core Spray (HPCS) system actuation. The error caused a pressure spike in the reference leg which resulted in an invalid Reactor Water Low Level signal being sensed by the level transmitters associated with the reference leg. The HPCS pump and Division 3 Diesel Generator started; however, because reactor water level was being maintained above the HPCS injection valve closure setpoint, the HPCS injection valve did not open and the HPCS system did not inject into the RPV. This event is being reported in accordance with 10CFR50.73(a)(2)(iv) as an event that resulted in an automatic actuation of an Engineered Safety Feature.

The cause of the event is personnel error, failure to follow procedure. The Instrumentation and Controls (I&C) technicians received unexpected flow indications while performing steps of the purge panel restoration procedure. Instead of stopping activities, the technicians reperformed steps which induced a pressure spike into the associated reference leg and transmitters.

The technicians involved with the event received disciplinary action in accordance with company policy. The event is being reviewed by I&C supervisors and technicians with emphasis placed on procedural compliance.

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I. Introduction

On June 10, 1997, at approximately 1831 hours, an Instrumentation and Controls (I&C) technician error resulted in an inadvertent High Pressure Core Spray [BG] (HPCS) system actuation without injection into the reactor pressure vessel (RPV) as well as actuation of the Division 3 Diesel Generator [EK] and its associated support systems including the Division 3 Emergency Service Water [BI] (ESW) system. Notification was made to the NRC via the Emergency Notification System at 1918 hours (ENF No. 32457), in accordance with the requirements of 10CFR50.72(b)(2)(ii). This event is being reported in accordance with 10CFR50.73(a)(2)(iv) as an event that resulted in an automatic actuation of an Engineered Safety Feature (ESF).

At the time of the event, the plant was in Mode 4 with the reactor shut down. The RPV pressure was at approximately 7 psig with reactor coolant temperature being maintained between 110 and 130 degrees Fahrenheit (F).

II. Event Description

On June 5, 1997, the plant entered a forced outage (reference LER 97-005) and subsequently on June 9, 1997, at approximately 2200 hours entered mode 4. On June 10, 1997, as part of the Cold Shutdown surveillance requirements, Surveillance Instruction (SVI)-B21-T2010, "RPV Level Instrument Check Valve Cold Shutdown Operability Test," was being performed to demonstrate the operability of the RPV water level instrument continuous backfill supply check valves. At 1220 hours, as part of the prerequisites to the surveillance activities, the four reference leg purge panels [PL] were secured in accordance with the associated instrument maintenance instructions (IMIs).

On June 10, 1997, at 1338 hours, authorization was obtained by the I&C technicians to start the check valve testing. The check valves for the four reference legs were tested satisfactorily, and three of the four reference leg purge panels were returned to service in accordance with the associated IMIs. At 1831 hours, during the restoration of the fourth reference leg purge panel utilizing IMI-E2-58, "Reference Leg Purge Panel 1H51-P1432D Operation," the technicians' activities induced a pressure spike into the reference leg causing the associated RPV level transmitters [LT] to sense a low level condition. This invalid low level signal resulted in the automatic actuation of the HPCS system, the Division 3 Diesel Generator, and associated support systems including the Division 3 ESW system. Additionally, Reactor Protection system (RPS) half scram, Primary Containment and Drywell half isolation, and Division 2 Redundant Reactivity Control system (RRCS) signals were received as a result of the invalid low level signal being sensed by the associated transmitters on the reference leg. Control room operators immediately entered Off-Normal Instruction (ONI)-E12-1, "Inadvertent Initiation of ECCS/RCIC (Unit 1)," for the inadvertent HPCS actuation.

Because RPV water level was being maintained above the high level setpoint for the HPCS injection valve shutoff, the HPCS injection valve remained closed and the HPCS system did not inject into the RPV. On June 10, 1997, at 1833 hours, the HPCS pump was turned off. At 1852 hours, the HPCS start logic was reset and the system was placed in standby readiness. It was determined that the HPCS actuation was

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caused by I&C technician activities associated with the reference leg purge panel activities and, at 1940 hours, ONI-E12-1 was exited. The Division 3 Diesel Generator was shutdown to standby at 2020 hours, and at 2040 hours, the Division 3 ESW system was shutdown to standby.

III. Cause of Event

The cause of the event is personnel error, failure to follow procedure. The I&C technicians performing the reference leg purge panel restoration in accordance with IMI-E2-58 did not comply verbatim with the instructional steps after receiving unexpected flow indications. One of the instructional steps required the technicians to reposition a 3-way valve on the reference leg purge panel. The handle on the 3-way valve was loose (contributing cause) resulting in the internals of the 3-way valve not being moved to the required position and the correct flow path not being established. This was discovered by the technicians when later steps to adjust flow could not be performed successfully. The technicians attempted to reperform some steps of the instruction, discovered and tightened the loose handle, and positioned the 3-way valve as previously required. Reperforming the valve alignments under these conditions induced a pressure spike in the reference leg which caused the associated level transmitters to sense a low reactor water level. The trip units associated with the affected transmitters actuated logic causing the HPCS/Division 3 actuations as well as the "half" signals to the RPS, RRCS, and Primary Containment and Drywell Isolation system.

Maintenance Administrative Instruction (MAI)-0504, "Plant Instrument Calibration and Maintenance," states that IMIs that are not general instructions shall not be deviated from without the completion of a procedure/instruction change. IMI-E2-58 is not a general instruction and is written for specific equipment. The expectation was for the technicians to contact the control room operators and I&C supervision if difficulties were encountered. The technicians attempted to resolve the issue outside of procedural guidance.

I&C maintenance support engineers interviewed the technicians and evaluated the event to determine if there were contributing equipment or procedural issues. No procedural issues relating to the cause of the event were identified. One equipment issue, the loose handle on the 3-way valve, was identified as a contributor to the event.

IV. Safety Analysis

The HPCS system pumps water through a peripheral spray ring sparger mounted above the reactor core. Coolant is supplied over the entire range of system operation pressures. The primary purpose of HPCS is to maintain reactor vessel inventory after small breaks which do not depressurize the reactor. HPCS also provides spray cooling heat transfer during breaks in which core uncover is calculated.

The HPCS system consists of a single motor-driven centrifugal pump located outside the primary containment, a spray sparger in the reactor vessel located above the core and associated system piping, valves, controls, and instrumentation. The system is designed to operate from normal offsite auxiliary power or from a standby diesel generator supply if offsite power is not available.

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The HPCS system and associated diesel generator are initiated at Level 2 to maintain water level above the top of active fuel. The RPV water level 2 signals are initiated from four level transmitters (two utilizing reference leg 1B21-D0004C and two utilizing reference leg 1B21-D0004D) that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the RPV. RPV water level is measured by using differential pressure transmitters calibrated to measure the difference in pressure between the reference leg and the variable leg.

Purge panels 1H51-P1432A through D are provided for reference legs 1B21-D0004A through D0004D respectively to mitigate non-condensable gases coming out of solution during and after a postulated rapid RPV depressurization and causing inaccurate level instrumentation responses. Operation of these purge panels is controlled by IMI-E2-55 through IMI-E2-58 for 1H51-P1432A through D. Performance of SVI-B21-T2010 satisfies full exercise and alternate position Technical Specification Surveillance Requirements for RPV level instrument supply check valves located between the purge panels and the reference legs. SVI-B21-T2010 directs the securing and restoration of the reference leg purge panels in accordance with IMI-E2-55 through IMI-E2-58.

An Emergency Response Information system (ERIS) trace comparing reference leg pressures (1B21-D0004C and 1B21-D0004D), during the time of the event, captured the pressure excursion on the 1B21-D0004D reference leg only. The pressure in the 1B21-D0004D reference leg increased from approximately 8 psig to 19 psig. The duration of this perturbation was approximately 250 milliseconds. With no change in the actual RPV water level (variable leg pressure constant), any increase in the pressure in the reference leg causes a higher differential pressure which is interpreted by the associated transmitters as a decreasing level. Prior to the HPCS system actuation, RPV water level was constant. The pressure increase on the 1B21-D0004D reference leg caused a large differential pressure increase which was interpreted by the transmitters on the reference leg as a decreased water level. The ERIS trace verified an indicated RPV water level decrease sufficient to cause the Level 2 HPCS actuation.

During this event, the equipment responded as designed to the invalid low RPV water level signal. The unexpected actuation of HPCS without injection into the RPV did not adversely affect the safe operation of the plant; therefore, this event is considered to have minimal safety significance.

V. Similar Events

LER 97-001 documents an event in which a Nonlicensed Operator performed an inappropriate procedural step which resulted in a reactor scram and other ESFs. Operations personnel involved in the event were counseled concerning the event, expectations concerning pre-job briefings, and missed opportunities for preventing the event through self-checking and checking of others. A tool was developed to aid operations supervision identifying high risk tasks and in determining appropriate level of briefing detail and extent of supervision required. The corrective actions for LER 97-001 were intended to maintain better control of operations related evolutions and could not reasonably be expected to prevent the event documented by LER 97-006.

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VI. Corrective Actions

The following corrective actions have been taken or are in progress:

1. The I&C technicians involved in the event received disciplinary action, in accordance with company policy, regarding unexpected results obtained while performing instructions and the importance of notifying supervision prior to proceeding.
2. I&C maintenance support engineers reviewed SVI-B21-T2010 and the IMIs associated with operation of the reference leg purge panels. No deficiencies in relation to the event were identified.
3. As identified in the site corrective action program, the I&C Superintendent is scheduled to review the event with I&C supervisors and technicians, reinforcing expectations for procedural compliance and emphasizing the requirements of MAI-0504.

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].

The following table identifies those actions which are considered to be regulatory commitments. Any other actions discussed in this document represent intended or planned actions, are described for the NRC's information, and are not regulatory commitments. Please notify the Manager - Regulatory Affairs at the Perry Nuclear Power Plant of any questions regarding this document or any associated regulatory commitments.

Commitments

None