Entergy

Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
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Michael A. Balduzzi
Site Vice President

March 30, 2005

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

SUBJECT: Entergy Nuclear Operations, Inc.
Pilgrim Nuclear Power Station
Docket No.: 50-293
License No.: DPR-35

Licensee Event Report 2005-001-00

LETTER NUMBER: 2.05.026

Dear Sir or Madam:

The enclosed Licensee Event Report (LER) 2005-001-00, "High Pressure Coolant Injection System Inoperable due to Fuse Failure in Motor Operated Valve Control Circuit," is submitted in accordance with 10 CFR 50.73.

There are no commitments contained in this letter.

Please do not hesitate to contact me if there are any questions regarding this report.

Sincerely,

Michael A. Balduzzi

DWE/dm

Enclosure: LER 2005-001-00

cc: Mr. Samuel J. Collins
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
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Senior NRC Resident Inspector

Mr. John Boska, Project Manager
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INPO Records

IE22

NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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TITLE (4)
High Pressure Coolant Injection System Inoperable due to Fuse Failure in Motor Operated Valve Control Power Circuit

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
									N/A	05000
02	13	2005	2005	001	00	03	30	2005	FACILITY NAME: N/A	DOCKET NUMBER: 05000

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR: (Check one or more) (11)			
POWER LEVEL (10)	100	20.2201(b)	22.2203(a)(3)(i)	50.73(a)(2)(i)(C)	50.73(a)(2)(vii)
		22.2202(d)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(A)
		20.2203(a)(1)	20.2203(a)(4)	50.73(a)(2)(ii)(B)	50.73(a)(2)(viii)(B)
		20.2203(a)(2)(i)	50.36(3)(1)(i)(A)	50.73(a)(2)(iii)	50.73(a)(2)(ix)(A)
		20.2203(a)(2)(ii)	50.36(3)(1)(ii)(A)	50.73(a)(2)(iv)(A)	50.73(a)(2)(x)
		20.2203(a)(2)(iii)	50.36(c)(2)	50.73(a)(2)(v)(A)	73.71(a)(4)
		20.2203(a)(2)(iv)	50.46(a)(3)(ii)	50.73(a)(2)(v)(B)	73.71(a)(5)
		20.2203(a)(2)(v)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(C)	OTHER
		20.2203(a)(2)(vi)	50.73(a)(2)(i)(B)	X 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Bryan Ford – Licensing Manager	(508) 830-8403

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
A	BJ	FU	B569	Y					

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)

On February 13, 2005 at about 1900 hours, the HPCI system was declared inoperable due to the discovery of a failure of a fuse in the control circuit that powers the normally closed HPCI system motor operated injection valve. The failure was discovered when the valve's position indicating light was observed not illuminated during a shift turnover. The failed fuse and the accompanying fuse that power the valve's control circuit were replaced, and the system was returned to operable, standby status by 2150 hours on February 13, 2005.

The direct cause of the fuse failure was separation of the fuse element from the fuse end cap (ferrule) that was most likely due to manufacturing defect(s) introduced when the fuse was manufactured (pre-1994). The fuse was a Bussman Limitron, Class RK1, KWN-R-10 type fuse. The root cause was utility non-licensed supervisory personnel error. Two supervisors failed to follow corrective action program procedure requirements for performance and tracking of corrective actions in that a generic equipment issue was not adequately dispositioned in the corrective action process. Corrective actions planned include additional training on corrective action program responsibilities, and the replacement of additional fuses.

This condition posed no threat to public health and safety.

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

BACKGROUND

The Pilgrim Station core standby cooling systems (CSCS) consist of the high pressure coolant injection (HPCI) system, automatic depressurization system (ADS), residual heat removal (RHR) system low pressure injection (LPCI) mode, and core spray system. The HPCI system is designed to pump water into the reactor vessel for high pressure core cooling. Although not part of the CSCS, the reactor core isolation cooling (RCIC) system is also designed to pump water into the reactor vessel for high pressure core cooling, similar to the HPCI system.

The HPCI system injection piping includes two motor operated valves, MO-2301-8 and MO-2301-9, and a check valve, CK-2301-7. Valve MO-2301-8 is normally closed and is designed to automatically open on a system initiation signal. The control circuit of the circuit breaker that powers the valve motor operator is powered by 125-volt dc power. Indication lamps that are also powered by the same 125-volt dc control power circuit provide position indication for the valve. The control circuit is protected and powered by two 10-amp control fuses such that the circuit is de-energized by the electrical opening or removal of either fuse.

Technical Specification (TS) 3.5.C.1 specifies HPCI system operability when irradiated fuel is in the reactor vessel, reactor pressure is greater than 150 psig, and reactor coolant temperature is greater than 365° F. TS 3.5.C.2 specifies a 14-day limiting condition for operation (LCO) from and after the date the system is made or found inoperable for any reason provided that during such 14 days all active components of the ADS, RCIC system, RHR system (LPCI mode), and Core Spray system are operable. TS 3.5.C.3 specifies a 24-hour timeframe for the initiation of an orderly shutdown (to a cold shutdown condition) if the requirements of Technical Specification 3.5.C cannot be met.

On February 13, 2005, at about 1900 hours, a routine shift turnover of licensed operators was being completed. As part of the shift turnover, the control panels in the main control room are walked down. The control panels include the HPCI system control panel, Panel C-903. During the walkdown it was observed that the position indicating light for the HPCI system injection valve MO-2301-8 was not illuminated as expected. The bulb for the position indicating light was replaced but the light remained not illuminated.

EVENT DESCRIPTION

On February 13, 2005 at 1900 hours, the HPCI system was declared inoperable, and a 14-day LCO was entered. This action was taken because the control power circuit of the normally closed HPCI system injection valve MO-2301-8 was found de-energized as a result of investigating the valve's position indicating light on a main control room panel that was observed not illuminated during the shift turnover. The associated position indicating light for valve MO-20301-8 on the alternate shutdown panel was also not illuminated.

The investigation found a failed fuse in the valve's control circuit that rendered the valve inoperable. The failed fuse and the accompanying fuse that power the valve's control circuit were replaced. The position indicating light illuminated after the fuses were replaced, and the HPCI system was returned to operable, standby status at 2150 hours. The 14-day LCO was terminated at 2150 hours on February 13, 2005.

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The NRC Operations Center was notified of the condition in accordance with 10 CFR 50.72 at 2216 hours on February 13, 2005.

The condition occurred while at 100 percent reactor power with the reactor mode selector switch in the RUN position. The reactor vessel pressure was approximately 1035 psig with the reactor water temperature at the saturation temperature for the reactor pressure.

CAUSE

The direct cause was the failure of a 10-amp fuse in the 125-volt DC control power circuit of valve MO-2301-8. The failure was separation of the fuse element from the fuse end cap (ferrule) that was most likely due to manufacturing defect(s) introduced when the fuse was manufactured (pre-1994). The fuse was a Bussman Limitron, KWN-R-10 type fuse, with no date code on the fuse. The defect(s) resulted in a weak solder connection between the fuse end cap and fuse element. Inspection of the fuse identified the fusible link to be intact. The cause is the same as that previously reported in LER 2004-002-00.

The root cause of the condition described in this report was utility non-licensed supervisory personnel error. Two supervisors failed to follow corrective action program procedure requirements for performance and tracking of corrective actions in that a generic equipment issue, stemming from a previous root cause analysis for a similar condition reported in LER 2004-002-00, was not adequately dispositioned in the corrective action process.

CORRECTIVE ACTION

The following corrective actions have been taken.

The failed fuse and the accompanying fuse that power the valve's control circuit were replaced.

The population of suspect fuses has been prioritized based on safety significance, and a schedule has been developed for the replacement of similar fuses whose failure could prevent a safety function. The replacement of these fuses was underway when this report was prepared.

Coaching the responsible supervisors regarding the roles and expectations of corrective actions in the corrective action program.

Corrective actions planned include the following.

Performing additional training on corrective action program responsibilities.

These actions are being tracked in the corrective action program.

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SAFETY CONSEQUENCES

The condition posed no threat to public health and safety.

The position indicating light on the control room panel for valve MO-2301-8 was discovered not illuminated by an on-shift control room licensed operator during the shift turnover at about 1900 hours on February 13, 2005. The control room panels are walked-down during each shift turnover of the control room operators. The power and position indicating lamps on the control panels, including the position indicating light for valve MO-2301-8, are observed during the shift turnover walkdown and are also observed periodically during each shift by the on-shift licensed operator. The position indicating light is also observable by other on-shift licensed operators in the control room including the Operations Shift Supervisor. The previous shift turnover was conducted at about 0700 hours on February 13, 2005. During these activities, the position indicating light for valve MO-2301-8 was illuminated. The condition was not observed until the succeeding shift turnover. Therefore, the fuse failure is assumed to have occurred at or near the time of discovery.

The Core Standby Cooling Systems (CSCS) consist of the HPCI system, Automatic Depressurization system (ADS), Core Spray system, and the Residual Heat Removal (RHR) system in the Low Pressure Core Coolant Injection (LPCI) mode. Although not part of the CSCS, the Reactor Core Isolation Cooling (RCIC) system is capable of providing water to the reactor vessel for high pressure core cooling, similar to the HPCI system. On February 13, 2005, during the period of 1900 – 2150 hours, the HPCI system was inoperable due to the discovery of and time needed to replace the failed fuse. Preceding the discovery of the failed fuse, the RHR system train 'A' was inoperable for the LPCI mode for about two minutes, 1338 – 1340 hours on February 13, 2005, when the LPCI train 'A' piping portion of the keepfill system was checked, and the Core Spray system train 'A' was inoperable for about eight minutes, 1415 hours – 1423 hours, when train 'A' piping portion of the keepfill system was checked. These brief periods were less than the 24-hour timeframe specified by Technical Specification 3.5.C.3. Except for those periods, the RHR/LPCI mode and the ADS, Core Spray, and RCIC systems were operable. In the unlikely event the RCIC system was to have become inoperable while the HPCI system was inoperable and core cooling was necessary, an actuation (automatic or manual) of the ADS would function to reduce reactor vessel pressure for low pressure core cooling provided independently by the RHR (LPCI mode) and/or Core Spray system.

REPORTABILITY

This report was submitted in accordance with 10 CFR 50.73(a)(2)(v)(D) because the HPCI system was inoperable due to the failed fuse.

SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) issued since 2002. The review focused on LERs involving fuse failures. This review identified similar events reported in LER 2002-001-00, "High Pressure Injection System Inoperable due to Fuse Failure," and LER 2004-002-00, "High Pressure Injection System Fuse Failure While System Inoperable for Planned Maintenance and Testing."

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ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS	CODES
Fuse	FU
Valve, injection (MO-2301-8)	INV

SYSTEMS

High Pressure Coolant Injection (HPCI) system	BJ
DC Power system-Class 1E	EJ