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10CFR50.73

JUL 3 0 2007
LR-N07-179

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-001

Hope Creek Generating Station Unit 1
Facility Operating License No. NPF-57
Docket No. 50-354

Subject: Licensee Event Report 2007-002-00

In accordance with 10 CFR 50.73(a)(2)(iv)(A) and 10 CFR 50.72 (b)(2)(iv)(A), PSEG Nuclear LLC, is submitting Licensee Event Report Number 07-001-00, Docket No. 50-354.

Should you have any questions concerning this letter, please contact Mr. Francis D. Possessky at (856) 339-1160.

Sincerely,

John F. Perry

John F. Perry
Plant Manager
Hope Creek Generating Station

Attachment: Licensee Event Report

IE22
NRR

cc: Mr. S. Collins, Administrator - Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Mr. R. Ennis, Licensing Project Manager - Hope Creek
U.S. Nuclear Regulatory Commission
Mail Stop 08B1
Washington, DC 20555-0001

USNRC Resident Inspector office - Hope Creek (X24)

Mr. P. Mulligan, Manager IV (Acting)
Bureau of Nuclear Engineering
PO Box 415
Trenton, New Jersey 08625

NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)	Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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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4. TITLE
Performance of Vital Bus Surveillance Caused a Partial Loss of Feed Resulting in a Manual Reactor Scram

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME: N/A	DOCKET NUMBER
05	29	2007	2007	- 002 -	00	07	30	2007	FACILITY NAME: N/A	DOCKET NUMBER

9. OPERATING MODE: 1

10. POWER LEVEL: 100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(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(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(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)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Francis D. Possessky, Compliance Engineer	856-339-1160

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

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED		15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☒ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)*	☐ NO		11	16	2007

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On May 29, 2007 while operating with the reactor at 100% power and the main generator synchronized to the grid, a manual scram was initiated in anticipation of a low reactor water level condition.

An unexpected slow (dead bus) transfer of a 4 KV Class 1-E bus from the normal to alternate source occurred during monthly relay testing. The slow (dead bus) transfer and subsequent loss of a non-safety related motor control center (MCC) resulted in a loss of feed water followed by a reactor scram. A potential personnel error or faulty relay initiated the slow bus transfer and a low margin condition associated with the reactor feed pump oil system design caused a loss of 2 reactor feed pumps. As a result of these conditions reactor level could not be maintained and operators took the action to manually scram the reactor. After the scram, reactor water level lowered to Level 2 and a valid ECCS initiation signal caused HPCI and RCIC to start and inject to the core. The ECCS injection required a 4-hour report that was transmitted to the NRC in accordance with 10 CFR 50.72 (b)(2)(iv)(A).

Corrective actions included revising the surveillance procedure to require testing only be performed on an open breaker and to verify that the relay contacts are in the correct state upon completion of the surveillance. Operating procedures were revised to maintain both Reactor Feedwater Pump (RFP) Lube Oil pumps operating for each RFP.

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

PLANT AND SYSTEM IDENTIFICATION

General Electric – Boiling Water Reactor (BWR/4)
Emergency Onsite Power Supply System – {EK}
Feedwater System – {SJ}

*Energy Industry Identification System {EIIS} codes and component function identifier codes appear as {SS/CCC}

IDENTIFICATION OF OCCURRENCE

Event Date/Time: May 29, 2007 - 08:34
Discovery Date/Time: May 29, 2007 - 08:34

CONDITIONS PRIOR TO OCCURRENCE

Hope Creek was in Operational Condition 1 with reactor power at 100%. No structures, systems, or components were inoperable that contributed to the event.

DESCRIPTION OF OCCURRENCE

On Tuesday May 29, 2007, relay technicians were assigned to perform a feeder degraded voltage monthly instrumentation channel functional test on the 4kV 'A' channel (10A401 bus) breaker 52-40108. Permission was received from the control room to begin the surveillance on channel 1(A-B) on this breaker. This time was documented in the Technical Specification (TS) surveillance logs as 0823. It was understood that there was only one hour available for the channel 1(A-B) and one hour available for channel 2(B-C), which is typical for short duration LCO surveillances. The procedure states that the test should be completed in as little time as possible.

Test switches 8 and 9 (normal AC power to the relay) on relay 27 channel 1(A-B) were opened and a variable AC power supply was connected to the relay for testing purposes. A calibration test was performed on the relay by recording the drop out and pick up voltages. These voltages were satisfactory because the relay responded within its technical specification and administrative criteria.

The next step was to test the feeder degraded voltage relays and timing checks. A timer stop module (a device used to time relay actuation) was connected to the timer stop test switch jaws for channel 1(A-B). The variable AC supply was dropped instantaneously to 109VAC and the time that it took for the relay to actuate was recorded. The time was within acceptance criteria and no adjustments were needed. The variable AC power supply was disconnected from relay 27(A-B), and test switches 8 and 9 were closed to restore normal AC power to the relay. The relay de-energized and closed and was verified to be in the closed state. It was also verified that no alarms associated with the bus were locked in. Channel 1(A-B) was signed out of the surveillance logs and channel 2(B-C) was signed in at 0831, 8 minutes after channel 1(A-B) was started.

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Channel 2(B-C) began similarly to channel 1(A-B). The calibration test was performed by recording the drop out and pick up voltages of relay 27(B-C). These voltages were then compared to the TS acceptance criteria, as well as the administrative criteria in the procedure. No adjustments were needed.

Approximately 19 seconds after dialing down the drop out voltages and prior to commencing the test for the feeder degraded voltage relays and timing checks, the 52-40108 breaker opened at 08:34:47 and a slow transfer signal of loads to the alternate feeder breaker (52-40101) was initiated. Voltage was restored to the bus through the 52-40101 breaker. This slow transfer allowed enough time for the bus 70% under voltage relays to drop out and initiate the 'A' channel Loss of Offsite Power (LOP) sequencer leading to a shedding of the non-1E MCC.

The loss of the MCC caused the operating oil pumps for the A and B Reactor Feed Pump (RFP) turbines to lose power. The standby oil pumps for both of the in service A and B RFPs started. The standby oil pumps did not restore the Control/Lube Oil pressure fast enough and the oil pressure degraded to the Low-Low Lube Oil trip set point, resulting in the loss of two out of the three RFPs.

At 08:35:03, the Hope Creek reactor was manually tripped offline anticipating reaching the low-level scram set point.

CAUSE OF OCCURRENCE

The root cause of the unexpected bus transfer could not be conclusively determined by the investigation. There are two potential causes to the initiating event that are being addressed. The timer stop timing module test leads may have been left in place from a previous procedure step creating a low impedance path to satisfy the logic path. It was noted that if the test leads had not been properly removed in the correct sequence, then the unexpected slow (dead bus) transfer would occur. The maintenance personnel performing the surveillance stated that they believed they followed the procedure correctly. The investigation concluded from simulated testing of the conditions that the actual alarm chronology contradicted personnel statements. This human performance failure is the most likely root cause.

A stuck channel 1(A-B) 27X 7-8 contact along with the HFA channel 2(B-C) 27X HFA relay being tested would satisfy the logic to cause a slow transfer. The root cause for this problem cannot be verified without a vital bus outage, which will be performed at the next refueling outage. Multiple tests were performed to ensure operability. The surveillance was re-performed satisfactorily. An additional surveillance was later performed and the contacts were visually verified to function correctly.

The RFPT oil system design is not adequate to assure that the standby lube oil pump will start and maintain minimum operating pressure on loss of the operating oil pump. This is an original equipment manufacturer design deficiency. This deficiency was identified in 2003 and two modifications were installed to improve system performance. Corrective actions were inappropriately closed for the 2003 event without having implemented one of the corrective actions as planned, and without having performed the CAPR effectiveness review as planned.

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PREVIOUS OCCURRENCES

A review of previous reportable events at Hope Creek was performed to determine if a similar event had occurred.

09/19/03 – Hope Creek, LER 2003-007-00 Reactor Scram Due To Electrical Transient, Low Reactor Water Level And Loss Of Reactor Feed Pumps A and C. Corrective actions from this event were not completed in a timely manner and could have prevented the partial loss of feedwater during this 2007 event.

SAFETY CONSEQUENCES

The safety impact is minimal due to all plant systems operating as designed.

The momentary loss of the non-1E 10A401 bus is bounded by the loss of AC power event and does not impact reactor safety.

The loss of power to the 10A401 bus normally would not impact electrical power generation. However, under the current design, the reactor feed pump lube oil system cannot withstand the loss of the only operating lube oil pump. Such a loss will cause a RFP trip.

The loss of all feed water flow (USAR section 15.9.6.3.3.I event 20) bounds the loss of two RFPs and does not impact reactor safety.

A review of this event determined that a Safety System Functional Failure (SSFF) has not occurred as defined in Nuclear Energy Institute (NEI) 99-02.

CORRECTIVE ACTIONS

Surveillance procedure has been revised to require testing on an open breaker and to verify that contact 7-8 is open at the conclusion of each section of the procedure and to create verification for the step that removes the test equipment.

The RFP lube oil system will be operated with two lube oil pumps in operation for each RFP until a permanent fix can be implemented.

COMMITMENTS

This LER contains no commitments.