



JAN 29 2010

LR-N10-0024

10CFR50.73

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

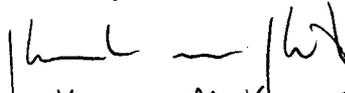
Subject: Licensee Event Report 2009-006

In accordance with 50.73(a)(2)(ii)(B), PSEG Nuclear LLC is submitting Licensee Event Report (LER) Number 2009-006.

Should you have any questions concerning this letter, please contact Mr. Timothy R. Devik at (856) 339-3108.

No regulatory commitments are contained in the LER.

Sincerely,


KENNETH M. KWATON FOR

Lawrence M. Wagner
Plant Manager
Hope Creek Generating Station

Attachment: Licensee Event Report 2009-006

JE22
NUR

cc: Mr. S. Collins, Administrator – Region 1
U.S. Nuclear Regulatory Commission
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Hope Creek Commitment Tracking Coordinator

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: 80 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.

1. FACILITY NAME Hope Creek Generating Station	2. DOCKET NUMBER 05000 354	3. PAGE 1 OF 4
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4. TITLE
Post-fire Safe Shutdown Analysis Error

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	DOCKET NUMBER
12	02	2009	2009	- 006 -	000	01	29	2010	N/A	
									FACILITY NAME	DOCKET NUMBER
									N/A	

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 100	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A						
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)								

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME Timothy R. Devik, Sr. Compliance Engineer	TELEPHONE NUMBER (Include Area Code) 856-339-3108
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
X	VI	AHU	N/A	N					

14. SUPPLEMENTAL REPORT EXPECTED <input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO	15. EXPECTED SUBMISSION DATE MONTH: DAY: YEAR:
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On December 2, 2009, during a review of the post-fire safe shutdown analysis, it was noted that conditions existed whereby the requirements of the Hope Creek (HC) fire protection program (BTP CMEB 9.5-1) for the required degree of separation for redundant safe shutdown trains were not met. Contrary to the Updated Final Safety Analysis Report (UFSAR) Section 9A, a postulated fire in either of the reactor building fire areas (RB1 or RB2) could have tripped, and prevented the start of both chilled water pumps, thus causing a loss of HVAC to several areas. The loss of the HVAC system is due to a logic system interrelationship that the post-fire safe shutdown analysis does not specifically address. This is a condition that has existed since the initial post-fire safe shutdown analysis was performed.

In accordance with the example provided in NUREG 1022 (Rev. 2), this event is reportable under 10CFR50.73(a)(2)(ii)(B) as an unanalyzed condition that significantly degraded plant safety. An 8-hour NRC ENS notification was made in accordance with 10CFR50.72(b)(3)(ii)(B) on 12/02/09 (event number 45536).

At the time, HC was at 100% power. Corrective actions were initiated to establish immediate compensatory fire watches until the fire response procedures were revised. The post-fire safe shutdown analysis is being revised to identify the manual actions needed to address the logic interrelationships.

NRC FORM 366A
(9-2007)

**LICENSEE EVENT REPORT (LER) U.S. NUCLEAR REGULATORY COMMISSION
CONTINUATION SHEET**

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NARRATIVE**PLANT AND SYSTEM IDENTIFICATION**

General Electric – Boiling Water Reactor (BWR/4)
Control Building/Complex Environmental Control System – EISS Identifier {VI}*
Air Handling Unit – EISS Identifier {AHU}

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

IDENTIFICATION OF OCCURRENCE

Event Date: December 2, 2009
Discovery Date: December 2, 2009

CONDITIONS PRIOR TO OCCURRENCE

Hope Creek was in Operational Condition 1 at 100% core thermal power (CTP). No other structures, systems or components contributed to the event.

DESCRIPTION OF OCCURRENCE

On December 2, 2009, a review was being performed as part of the reconstitution efforts for the post-fire safe shutdown analysis. The review determined that in the reactor building fire areas RB1 (an electrical Division I area) and RB2 (an electrical Division II area), there were cooling fans {VI/AHU} in each area that are powered from separate divisions (Division I powers a fan in each area and Division II powers a fan in each area). The post-fire safe shutdown description in the UFSAR Section 9A (Tables 9A-8 and 9A-9) states that a fire in either area could cause the loss of both fans in the fire affected area and could also cause the loss of the fan located in the other reactor building area which is powered by the fire affected area electrical Division. The post-fire safe shutdown analysis description states that the redundant fan in the non-affected area would be used to maintain the HVAC system operating and the reactor could be shut down from the control room. For example, a fire in RB1 would cause the loss of one fan in both RB1 and RB2 (each powered by Division I) as well as the Division II fan located in RB1, but would not affect the Division II fan located in RB2. Based on a worst case fire effects analysis, it is assumed that the impacted fan's control logic system senses a low flow condition. Upon sensing a low flow condition, the affected fans would prevent their associated chilled water pump from starting, and would trip the associated chilled water pump, if running. The effect of having one fan in each division detecting a low flow condition is that both chilled water pumps are prevented from running.

Loss of the chilled water pumps would have caused the loss of the HVAC subsystems for the SACS room, Control Equipment Room, Switchgear Room and Control Room.

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SAFETY CONSEQUENCES AND IMPLICATIONS

The post-fire safe shutdown analysis (as described in UFSAR Section 9A and Tables 9A-8 and 9A-9) was incorrect in that the redundant HVAC fan would not be available to provide cooling to the non-fire area. This is because the analysis did not recognize that the loss of the HVAC fans in the affected area would also prevent both of the chilled water pumps from operating, which in turn would cause the loss of the associated fans in several HVAC systems.

The loss of the chilled water pumps would have prevented the Control Room Emergency Filtration systems from operating, the plant would be in a TS required shutdown condition (TS 3.0.3) if one of the systems could not be returned to service.

The plant response would have been a loss of multiple HVAC systems, causing the operators to enter the Loss of HVAC abnormal procedure. The actions taken would be to open area doors and provide supplemental cooling fans. If the actions taken were not successful in maintaining temperatures, or if the control room crew determined that the conditions existed that necessitated evacuation of the control room (due to temperature or equipment mal-operation), the plant would have been shutdown from the remote shutdown panel (RSP). The remote shutdown procedure would have directed that the Division II chilled water pump be controlled from the RSP. Upon taking control of the chilled water pump at the RSP, the logic circuit (low flow interlock) preventing the chilled water pump operation would be bypassed and the chilled water pump could be started and the Division II HVAC systems could be reestablished for the affected areas. The use of the abnormal procedures is not credited in the post-fire safe shutdown analysis.

If the fire was located in the Division II area, the same actions would have been performed. The exception would be that once the Division II chilled water pump was started from the RSP, the Division I SACS room (in RB1) would not receive cooling because the Division I chilled water pump would still be prevented from operation due to the logic interrelationship with its affected fan in RB2. The effect would be that the Division II areas outside of RB2 would have HVAC supplies and the associated post-fire safe shutdown systems would be cooled, however the SACS Division I room would not have HVAC cooling. Division II is the only division that has RSP controls available, thus the Division I chilled water pump cannot be started from the RSP.

The fire would have been detected by the control room, due to multiple alarms and indications, and the loss of the chilled water pumps and associated HVAC systems would also be indicated in the control room.

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

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CAUSE OF OCCURRENCE

The system interrelationships of the logic interlocks for the HVAC fans and the chilled water pumps was not properly understood in the initial post-fire safe shutdown analysis. The original analysis was based on commitments to GDC 3 of Appendix A to 10 CFR 50 and Branch Technical Position (BTP) Chemical Engineering Branch (CMEB) 9.5-1.

The post-fire safe shutdown analysis for fire areas RB1 and RB2 in the Hope Creek UFSAR, Table 9A-8 and Table 9A-9, states that the redundant HVAC fan located in the non-fire affected area will provide redundant cooling to that area. However, through the logic interlocks associated with the fans, the chilled water pumps will trip, and be prevented from running, removing HVAC systems from the SACS room, Control Equipment Room, Switchgear Room and Control Room. Loss of the chilled water pumps will prevent the associated HVAC fans from operating.

PREVIOUS OCCURRENCES

A review of Licensee Event Reports for the three prior years at Hope Creek was performed to determine if a similar event had occurred. No similar events were noted.

CORRECTIVE ACTIONS

The following corrective actions have been either taken or identified for this event:

- (1) A fire watch was established until permanent corrective actions could be implemented.
- (2) The fire response procedures for RB1 and RB2 have been revised to have an operator open the power supply (breaker) for the non-affected Division's fan located in the fire area to de-energize the interlock and start the redundant chilled water pump.
- (3) The post-fire safe shutdown analysis described in the UFSAR Tables T9A-8 and T9A-9 will be revised to take credit for the manual actions described in the procedures.
- (4) An extent of condition review was performed. Other areas that have similar logic relationships have an analyzed post fire safe shutdown analysis that assumes operation at the remote shutdown panel (RSP). Operation of the systems at the RSP will bypass any interlock preventing system operation and allow a manual start of the affected systems. No revisions to the post-fire safe shutdown analysis were necessary for these areas.
- (5) HC is reconstituting the post-fire safe shutdown analysis for the remaining fire areas.

COMMITMENTS

This LER contains no commitments.