WOLF CREEK
NUCLEAR OPERATING CORPORATION

September 19, 2011

Stephen E. Hedges
Site Vice President

WO 11-0067

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Docket No. 50-482: Licensee Event Report 2011-008-00, "Post-Fire Safe Shutdown Latent Design Issue May Cause Essential Service Water System Flow Imbalance"

Gentlemen:

The enclosed Licensee Event Report is being submitted pursuant to 10 CFR 50.73(a)(2)(ii)(B) regarding an unanalyzed condition that could potentially affect post-fire safe shutdown equipment at the Wolf Creek Generating Station.

Commitments made by Wolf Creek Nuclear Operating Corporation in the enclosed LER are identified in the Attachment to this letter.

If you have any questions concerning this matter, please contact me at (620) 364-4190, or Mr. Gautam Sen at (620) 364-4175.

Sincerely,

Stephen E. Hedges

SEH/rlt

Attachment
Enclosure

cc: E. E. Collins (NRC), w/a, w/e
J. R. Hall (NRC), w/a, w/e
G. B. Miller (NRC), w/a, w/e
Senior Resident Inspector (NRC), w/a, w/e

A006
JE22
NRR

LIST OF COMMITMENTS

The following table identifies those actions committed to by Wolf Creek Nuclear Operating Corporation in this document. Any other statements in this letter are provided for information purposes and are not considered regulatory commitments. Please direct questions regarding these commitments to Mr. Gautam Sen, Manager Regulatory Affairs at Wolf Creek Generating Station, (620) 364-4175.

REGULATORY COMMITMENT	DUE DATE
A plant modification will be implemented to resolve the PFSSD issue with EFHV0060.	Prior to plant startup following Refuel Outage 19.

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(10-2010)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
WOLF CREEK GENERATING STATION	05000 482	1 OF 4

4. TITLE

Post-Fire Safe Shutdown Latent Design Issue May Cause Essential Service Water System Flow Imbalance

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
										05000
07	20	2011	2011	- 008 -	00	09	19	2011	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

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)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)
- ☐ 50.73(a)(2)(i)(A)
- ☐ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☒ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Gautam Sen, Manager Regulatory Affairs	(620) 364-4175

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

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

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

On July 20, 2011 at 1313 CDT, during a review of the post-fire safe shutdown analysis for valve EFHV0060, "ESW Return from CCW Heat Exchanger," a condition was discovered where a fire in the Control Room could cause valve EFHV0060 to open. Valve EFHV0060 is required to be closed for post-fire safe shutdown when operating Train "B" essential service water (ESW). The opening of EFHV0060 would cause a flow imbalance in the ESW system and could reduce the ESW flow to other essential components.

The direct cause is a latent design deficiency that did not ensure that valve EFHV0060 was isolated/protected from the potential effects of a Control Room fire. An hourly fire watch was in place in the Control Room and will remain in place until this issue is resolved. Procedure OFN RP-017, "Control Room Evacuation," was revised to include interim compensatory actions to deenergize, and verify closed, valve EFHV0060. A plant modification will be implemented to resolve the PFSSD issue with EFHV0060.

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		YEAR	SEQUENTIAL NUMBER	REV NO.	
WOLF CREEK GENERATING STATION	05000 482	2011	-- 008 --	00	2 OF 4

PLANT CONDITIONS AT THE TIME OF THE EVENT

Mode 1
100% power
No structures, systems, or components were inoperable that contributed to this event.

DESCRIPTION OF THE EVENT

On July 20, 2011 at 1313 CDT, during a review of the post-fire safe shutdown (PFSSD) analysis for valve EFHV0060 [EIIS Code: BI-V], a condition was discovered where a fire in the control room could cause valve EFHV0060 to open. Valve EFHV0060 is the Train "B" Essential Service Water (ESW) Return from the Train "B" Component Cooling Water (CCW) Heat Exchanger [EIIS Code: CC-HX]. It is a normally closed valve and is required to be closed for post-fire safe shutdown when operating Train "B" ESW. Valve EFV0090 [EIIS Code: BI-V], which is installed in parallel with EFHV0060, is throttled to ensure the proper ESW flow balance for normal operation and accident conditions.

The configuration of EFHV0060 does not meet the requirements of Section III.G.3 of 10 CFR 50, Appendix R because the valve is not isolated from the effects of a Control Room fire. The opening of EFHV0060 would cause a flow imbalance in the ESW system and cooling flow to other essential components could be reduced to below the minimum required flow. Procedure OFN RP-017, "Control Room Evacuation," had no steps to close this valve or to ensure it is closed.

BASIS FOR REPORTABILITY

When a PFSSD issue is identified in which no or insufficient guidance is available to Operations to readily mitigate the postulated fire induced equipment maloperation, the issue is considered reportable under 10 CFR 50.72(b)(3)(ii)(B) and 10 CFR 50.73(a)(2)(ii)(B) as an unanalyzed condition that significantly degrades plant safety. This is based on NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Revision 2, Section 3.2.4. This section provides the following example:

> .... if fire barriers are found to be missing, such that the required degree of separation for redundant safe shutdown trains is lacking, the event would be reportable as an unanalyzed condition that significantly degraded plant safety.

A 10 CFR 50 Appendix R circuit separation issue, which could result in undesired equipment maloperation with a resulting adverse effect on PFSSD capability, is considered by Wolf Creek Nuclear Operating Corporation (WCNOC) to be equivalent to a condition where fire barrier protection is deficient.

As such, WCNOC is reporting this condition pursuant to 10 CFR 50.73(a)(2)(ii)(B) for any event or condition that resulted in the nuclear power plant being in an unanalyzed condition that significantly degraded plant safety.

ROOT CAUSE

The direct cause is a latent design deficiency that did not ensure valve EFHV0060 was isolated/protected from the potential effects of a Control Room fire. The condition is a design error that has been present since construction.

Valve EFHV0060 was not included in the original Control Room evacuation approach documented in letter SLNRC 84-0109. During the post-fire safe shutdown re-analysis project conducted at WCGS, the consequences of the valve failing to open were addressed but not the consequences of the valve spuriously opening.

The adverse PFSSD consequences of the valve spuriously opening when operating Train "B" ESW for PFSSD was identified in 2005 and the PFSSD area analyses for areas outside the Control Room were developed to address this concern. However, the impact on the Control Room evacuation procedure was not recognized at that time.

CORRECTIVE ACTIONS

An hourly fire watch was in place in the Control Room for other issues and will remain in place until this issue is resolved.

Procedure OFN RP-017, "Control Room Evacuation," has been revised to include interim compensatory actions to deenergize, and verify closed, valve EFHV0060.

A plant modification will be implemented to resolve the PFSSD issue with EFHV0060 prior to plant startup following Refuel Outage 19.

WCNOC corrective action document PIR 2005-3314 identified an issue where WCNOC did not completely address NRC IN 92-18, "Potential for Loss of Remote Shutdown Capability during a Control Room Fire." A review of all motor operated valves not previously addressed in PIR 2005-3314 or that are not isolated from the effects of a Control Room fire, will be conducted in an effort to ensure that the scope of NRC IN 92-18 applicable valves is addressed.

An independent third party review of the Control Room PFSSD analysis will be performed and will include a review of WCNOC's actions in response to NRC IN 92-18.

SAFETY SIGNIFICANCE

This issue was determined to have low safety significance. A fire in the Control Room of such magnitude and severity as to cause an evacuation and plant shutdown is extremely unlikely. Based on the Fire Hazards Analysis (E-1F9905), the combustible loading in the Control Room is low and interior finish materials meet or exceed the surface flammability requirements of applicable standards. Cables entering the Control Room are IEEE 383 rated. Large concentrations of cables in the Control Room

trenches are protected with an automatic Halon extinguishing system and automatic smoke detectors are located in the control cabinets and trenches. Furthermore, if a fire had occurred in the Control Room that caused the spurious opening of EFHV0060, operators could have throttled valve EFHV0052 [EIIS Code: BI-V], "Train "B" ESW inlet to the Train "B" CCW heat exchanger," to reduce ESW flow through the CCW heat exchanger.

OPERATING EXPERIENCE/PREVIOUS SIMILAR OCCURRENCES

LER 2005-007-00 reported a condition where a postulated fire could cause the loss of field flashing for the Train B Diesel Generator. This condition was caused by the original Electrical Fire Hazards Analysis completed for WCGS not identifying that field flashing may not be available if a fire occurs in the Control Room.

LER 2006-001-00 reported a condition where a re-evaluation of NRC Information Notice 92-18, "Potential For Loss Of Remote Shutdown Capability During A Control Room Fire," identified that in the event of a fire in the Control Room, 40 motor operated valves credited for post-fire safe shutdown could potentially fail in an unanalyzed condition.

LER 2010-003-00 reported a condition where a postulated fire induced hot short could have prevented operation of the Train B Diesel Generator if a fire occurred in the Control Room. This condition was due to an inadequate review of Control Room circuitry for impact on PFSSD following a Control Room fire.