WOLF CREEK
NUCLEAR OPERATING CORPORATION

Stephen E. Hedges
Site Vice President

June 21, 2010

WO 10-0042

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

Subject: Docket No. 50-482: Licensee Event Report 2010-007-00, "Post-Fire Safe Shutdown Fire-Induced Multiple Spurious Operation Issues"

Gentlemen:

The enclosed Licensee Event Report (LER) is being submitted pursuant to 10 CFR 50.73(a)(2)(ii)(B) and 10 CFR 50.73(a)(2)(v) regarding an unanalyzed condition that could potentially affect post-fire safe shutdown equipment at 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. Richard D. Flannigan at (620) 364-4117.

Sincerely,

Stephen E. Hedges

SEH/rlt

Attachment - List of Regulatory Commitments

Enclosure - Licensee Event Report 2010-007-00

cc: E. E. Collins (NRC), w/a, w/e
G. B. Miller (NRC), w/a, w/e
B. K. Singal (NRC), w/a, w/e
Senior Resident Inspector (NRC), w/a, w/e

IE22
NRR

LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Wolf Creek Nuclear Operating Corporation (WCNOC) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Richard Flannigan at (620) 364-4117.

REGULATORY COMMITMENT	DUE DATE/EVENT
A design modification to address issues 1, 2, 3, and 5 will be completed.	November 2, 2012
Additional PFSSD analysis will be performed for issue 4. Actions to address issue 4 will be implemented and completed.	November 2, 2012

NRC FORM 366 (9-2007) U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104 EXPIRES: 08/31/2010
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.

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4. TITLE
Post-Fire Safe Shutdown Fire-Induced Multiple Spurious Operation Issues

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
04	20	2010	2010	- 007 -	00	06	21	2010	FACILITY NAME	DOCKET NUMBER 05000

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)
Richard D. Flannigan, Manager Regulatory Affairs	(620) 364-4117

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				

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

While performing a post-fire safe shutdown review per Enforcement Guidance Memorandum (EGM) 09-002, "Enforcement Discretion for Fire Induced Circuit Faults," and Regulatory Guide 1.189, Revision 2, five fire-induced multiple spurious operation (MSO) issues were determined to be reportable pursuant to 10 CFR 50.73(a)(2)(ii)(B). EGM 09-002 provides enforcement discretion for non-compliances related to multiple fire-induced circuit faults. The five fire-induced MSO issues that were identified are:

- Three issues which could potentially prevent operation of the Residual Heat Removal Pump(s),
- An issue where pressurizer spray may spuriously actuate, and
- An issue where a Centrifugal Charging Pump could spuriously start and fill the pressurizer solid.

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PLANT CONDITIONS PRIOR TO EVENT

MODE – 1
Power – 100

EVENT DESCRIPTION

While performing a post-fire safe shutdown (PFSSD) review per Enforcement Guidance Memorandum (EGM) 09-002, "Enforcement Discretion for Fire Induced Circuit Faults," and Regulatory Guide (RG) 1.189, Revision 2, "Fire Protection for Nuclear Power Plants," five fire-induced multiple spurious operations (MSOs) issues were determined to be reportable. EGM 09-002 provides enforcement discretion for non-compliances related to multiple fire-induced circuit faults. The enforcement discretion period allows 6 months from the date of issuance of RG 1.189, Revision 2 to perform the following:

- Identify noncompliances related to multiple fire induced circuit faults
- Implement compensatory measures for the noncompliances, and
- Place the noncompliances in the licensees' corrective action program

Regulatory Guide 1.189, Revision 2, was issued on November 2, 2009. Therefore, the 6-month identification period ended on May 2, 2010. For noncompliances identified during the 6-month identification period, enforcement discretion continues for an additional 30 months to resolve identified noncompliances.

Wolf Creek Generating Station's (WCGS) licensing basis associated with PFSSD analysis is silent regarding the applicability and respective methodology for addressing multiple fire-induced circuit failures and MSOs for a fire outside the Control Room. Because of this, a conservative approach was applied during the PFSSD fire area reanalysis project to review each fire area outside the Control Room for MSO vulnerabilities utilizing a deterministic approach in an attempt to identify single and multiple equipment maloperation conditions that could potentially affect the ability to achieve and maintain PFSSD. This review approach, which was based on Nuclear Energy Institute (NEI) 00-01, "Guidance for Post Fire Safe Shutdown Circuit Analysis," Revision 2, identified single spurious and MSO issues, which required resolution.

NEI 00-01 provides a consistent process for performing a PFSSD circuit analysis including deterministic methods for addressing potential fire-induced circuit failure issues. NEI 00-01 describes the process in which the generic MSO list was developed utilizing industry input through the Pressurized Water Reactors (PWR) and Boiling Water Reactors (BWR) Owner's Groups. The NEI guidance further identifies that both the Generic MSO List and plant specific MSO items identified via an expert panel process are required to be assessed for applicability. WCGS completed a MSO expert panel review and developed a Plant Specific MSO List comprised of the applicable generic MSOs identified in Appendix G of NEI 00-01 as well as the MSO items identified during the expert panel review.

PFSSD analysis review of the Plant Specific MSO List resulted in the identification of the following five reportable PFSSD issues:

1. In fire areas A-27 (Control Rod Drive/MG Set Room) and C-21 (Lower Cable Spreading Room), a fire-induced spurious safety injection signal (SIS) coincident with a loss of Residual Heat Removal (RHR) pump [EIIS Code: BP-P] suction could prevent operation of both RHR pumps. The loss of RHR pump suction is postulated to occur due to a fire-induced spurious low level in the Refueling Water Storage Tank (RWST) which opens the containment sump to RHR pump suction valves and closes the RWST to RHR suction valves. In this case, the sump would be dry and the operating RHR pumps would have no suction source.

2. In fire area A-8 (Aux Bldg 2000 Elevation Hallway), a fire-induced spurious SIS coincident with a loss of RHR pump suction could prevent operation of both RHR pumps. The loss of RHR pump suction is postulated to occur due to fire induced damage to control circuits for the RWST to RHR suction valves that causes them to close.

3. In fire area A-8, a fire-induced spurious SIS coincident with RHR miniflow valves going closed could prevent operation of both RHR pumps. The RHR miniflow valves are postulated to spuriously close due to damage to the flow indicating switch or the associated cable, causing a spurious high flow signal.

4. In fire areas A-1, A-11, A-18, C-7, C-12, C-18, C-21, C-24 and RB, pressurizer spray valves [EIIS Code: PZR-V] could spuriously open and all four reactor coolant pumps (RCP) [EIIS Code: AB-P] may not stop from the Control Room. Pressurizer spray flow can be stopped by tripping the RCPs either from the Control Room or locally.

5. In fire areas C-18, C-21, C-22, C-24, C-30 and C-33, the Boron Injection Tank flow path could spuriously open and a charging pump could spuriously start. This would fill the pressurizer [EIIS Code: PZR] solid if not mitigated in a timely manner.

BASIS FOR REPORTABILITY

When a PFSSD issue is identified in which insufficient guidance is available to Operations personnel 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.

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A 10 CFR 50 Appendix R circuit separation issue which could result in undesired equipment maloperation with a resulting adverse affect on PFSSD capability, is considered by 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.

Additionally, this event is being reported pursuant to 10 CFR 50.73(a)(2)(v)(A) and (B) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are need to shut down the reactor and maintain it in a safe shutdown condition and remove residual heat. NUREG-1022 indicates that a design or analysis defect or deviation is reportable under this criterion if it could have prevented fulfillment of the safety function of structures or systems defined in the rules. The PFSSD analysis review determined that a fire-induced spurious SIS coincident with a loss of RHR pump suction could prevent operation of both RHR trains.

CAUSE

The apparent cause is latent design issues related to PFSSD that have existed since original plant design.

The original PFSSD analysis did not address MSO issues to the level of rigor that is now being applied in response to the NRC endorsement of the NEI 00-01 MSOs review methodology. This position is substantiated by the fact that WCGS's licensing basis associated with PFSSD analysis is silent regarding the applicability, scope and respective methodology for addressing multiple fire-induced circuit failures and MSOs for a fire outside the Control Room.

CORRECTIVE ACTIONS

Hourly fire watches were established for the affected areas. Procedure OFN KC-016, "Fire Response," was revised to identify interim mitigating actions in the event that a fire-induced MSO event occurred. These interim actions will remain in effect until the respective MSO issue is resolved.

A design modification will be completed by November 2, 2012 to address issues 1, 2, 3, and 5.

Additional PFSSD analysis is required for issue 4. The analysis and actions to correct issue 4 will be completed by November 2, 2012.

SAFETY SIGNIFICANCE

There were no adverse consequences that resulted from the identified conditions, as there was no actual plant fire. Due to fire protection administrative controls, availability of fire detection and suppression systems, the trained on-site fire brigade, and the minimal potential for rapid-fire growth in the fire areas, it is highly unlikely that a credible fire would result in the circuit failure combinations required for the MSO maloperation scenarios. The compensatory measure hourly fire watch and the establishment of procedure OFN KC-016 mitigating actions provide reasonable assurance that the identified MSO issues will not jeopardize PFSSD capability during the interim time frame prior to implementation of actions required for permanent issue resolution.

OPERATING EXPERIENCE/PREVIOUS EVENTS

LER 2005-005-00 reported a condition where a postulated fire could cause the loss of the Centrifugal Charging Pump's capability to successfully inject borated water into the reactor. This condition was caused by the original Electrical Fire Hazards Analysis (EFHA) having non-validated assumptions and being insufficiently documented.

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 EFHA completed for the WCGS not identifying that field flashing may not be available if a fire occurs in the Control Room.

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.