WOLF CREEK
NUCLEAR OPERATING CORPORATION

Russell A. Smith
Plant Manager

April 25, 2011

WO 11-0021

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

Subject: Docket No. 50-482: Licensee Event Report 2011-002-00, "Diesel Generator Declared Inoperable Due to Inadequate Installation of a Fuel-Rack Control Pin"

Gentlemen:

The enclosed Licensee Event Report (LER) is submitted pursuant to 10 CFR 50.73 regarding a diesel generator that was declared inoperable on February 22, 2011. Evaluations are in progress to determine the impact of an incorrectly installed fuel-rack control pin on diesel generator operation and the root cause of this event. Wolf Creek Nuclear Operating Corporation (WCNOC) will supplement LER 2011-002-00 when these evaluations have been completed and assessed.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4156, or Mr. Gautam Sen at (620) 364-4175.

Sincerely,

Russell A. Smith

RAS/rlt

Enclosure

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

IE22
NRR

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

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)

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4. TITLE

Diesel Generator Declared Inoperable Due to Inadequate Installation of a Fuel-Rack Control Pin

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
02	22	2011	2011	002	00	04	25	2011	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)
- ☐ 20.2201(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
A	EK	DG	Fairbanks-Morse	Y					

14. SUPPLEMENTAL REPORT EXPECTED

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

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR
08	31	2011

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

On February 22, 2011, with the plant at 100 percent power in Mode 1 and the "A" Diesel Generator (DG) in stand-by condition, a Wolf Creek Nuclear Operating Corporation (WCNOC) engineer on a system walk down identified that a control pin on the fuel rack for the "A" DG was not completely inserted and not secured by a washer and cotter pin in accordance with the design.

The "A" DG was declared inoperable at 1537 Central Standard Time (CST) on February 22, 2011 and returned to service at 0520 CST on February 23, 2011 after the control pin, washer and cotter pin were properly installed. The "B" DG and both offsite circuits were operable while the "A" DG was inoperable on February 22 and 23, 2011. The "A" DG may have been inoperable from 0200 CST on December 3, 2010, when it was removed from service for planned maintenance, to 0520 CST on February 23, 2011.

Evaluations are in progress to determine the root cause of this event and the impact of an incorrectly installed fuel-rack control pin on diesel generator operation.

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PLANT CONDITIONS PRIOR TO EVENT

Mode 1
100 percent power
No inoperable structures, components or systems, other than the "A" Diesel Generator (DG) [EIIS Codes: EK, DG], contributed to this event on February 22-23, 2011. The "B" DG was also inoperable during four intervals between December 3, 2010 and February 23, 2011, as shown in the Basis for Reportability.

EVENT DESCRIPTION

On February 22, 2011, with the plant at 100 percent power in Mode 1 and the "A" Diesel Generator (DG) in stand-by condition, a Wolf Creek Nuclear Operating Corporation (WCNOC) engineer on a system walk down identified that a control pin on the fuel rack of the "A" DG was not completely inserted and not secured by a washer and cotter pin in accordance with the design. The shift manager declared the "A" DG inoperable at 1537 CST on February 22, 2011.

The "A" DG was returned to service at 0520 CST on February 23, 2011 after the control pin, washer and cotter pin were properly installed. The "B" DG and both offsite circuits were operable while the "A" DG was inoperable on February 22 and 23, 2011. Operability of the "A" DG was last demonstrated before this event on January 24, 2011 during performance of procedure STS KJ-005A, "Manual/Auto Start, Sync and Loading of EDG NE01."

As shown in Figure 1 on page five of five, this control pin passes through the fuel rack to connect the injector pumps for the number six and number seven cylinders on the "A" DG. The DG governor [EIIS Codes: EK, 65] moves the fuel rack as necessary to control engine power output. The other fuel-rack control pins on the "A" and "B" DGs were inspected and found to be properly installed and secured by cotter pins. One cotter pin on the "B" DG was found with one of the two legs broken but it still properly secured the fuel-rack control pin. This cotter pin on the "B" DG was replaced on March 7, 2011.

Detachment of this fuel-rack control pin and fuel racks could result in the number seven cylinder and injector pump running at more than 100 percent of rated load. Overload conditions on one cylinder could potentially damage the "A" DG. With this control pin detached, the number seven cylinder fuel injector pump also may not move to the no-fuel position when the DG governor moves to shut down the DG.

WCNOC and vendor maintenance personnel replaced the fuel injection pump for the number six cylinder on December 3, 2010. That date is considered to be when the cotter pin was not properly installed in the fuel-rack control pin between the number six and number seven cylinders on the "A" DG.

The DGs are Colt-Pielstick / Fairbanks-Morse model 14PC2.5 engines. DGs "A" and "B" are dedicated to Engineered Safety Feature (ESF) buses NB01 and NB02 [EIIS Codes: EB, BU], respectively. A DG starts automatically on a safety injection (SI) signal or on an ESF bus undervoltage signal. In the event of a loss of preferred power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA), such as a loss of coolant accident (LOCA).

BASIS FOR REPORTABILITY

The "A" DG may have been inoperable from 0200 CST on December 3, 2010 to 0520 CST on February 23, 2011 because a fuel-rack control pin was incorrectly installed. Evaluations are in progress to determine the root cause of this event and the impact of an incorrectly installed fuel-rack control pin on DG operation.

During this time period, the "B" DG was also inoperable as shown below:

Out of Service	Returned to Service	Reason for Removal from Service
01/17/2011, 0400 CST	01/22/2011, 0940 CST	Seven-day equipment outage for planned maintenance
01/22/2011, 1946 CST	01/23/2011, 0703 CST	Planned maintenance on left-bank air start valve
02/10/2011, 0400 CST	02/11/2011, 1315 CST	Planned DG and Essential Service Water System equipment maintenance outage
02/17/2011, 1127 CST	02/19/2011, 0135 CST	"B" DG Fuel Oil Storage Tank out of compliance with limit on fuel cloud point

The guidance in NUREG-1022, Rev. 2, "Event Reporting Guidelines," indicates an event or condition is reportable per 10 CFR 50.73(a)(2)(v) if either offsite power or onsite emergency power is unavailable to the plant, regardless of whether the other system is available. This condition is, therefore, reported in accordance with 10 CFR 50.73(a)(2)(v)(A) through (D) as an event or condition that could have prevented fulfillment of a safety function.

Technical Specification (TS) 3.8.1, "AC Sources – Operating," requires two DGs capable of supplying the onsite Class 1E power distribution subsystem(s) [EIIS Codes: EB, ED, and EF] be operable in Modes 1, 2, 3 and 4. With the "A" DG considered inoperable from December 3, 2010 to February 23, 2011 and the "B" DG being inoperable as shown in the table above, multiple TS Conditions / Required Actions were not completed within the specified Completion Times. This event is considered a condition prohibited by TS, which is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B).

ROOT CAUSE

The immediate cause of this event is inadequate installation of a fuel-rack control pin and failure to properly secure a fuel-rack control pin with a washer and cotter pin after replacement of a fuel injection pump for the "A" DG by WCNOC and vendor maintenance personnel on December 3, 2010. A root-cause evaluation of this condition and an evaluation of the adverse impacts of a detached fuel-rack control pin on a DG in the stand-by condition, after an engine start and during extended operation are in progress. A supplemental report will be submitted to discuss the cause(s) and circumstances of this human performance-related root cause in accordance with 10 CFR 50.73(b)(2)(ii)(J).

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CORRECTIVE ACTIONS

The fuel-rack control pin between the number six and number seven cylinders was properly installed and properly secured with a new washer and cotter pin on February 23, 2011. The other fuel-rack control pins on the "A" and "B" DGs were then inspected and found to be properly installed and secured by cotter pins. One cotter pin on the "B" DG was found with one of the two legs broken but it still properly secured the fuel-rack control pin. This cotter pin on the "B" DG was replaced on March 7, 2011.

SAFETY SIGNIFICANCE

The "A" DG may have been inoperable from 0200 CST on December 3, 2010 to 0520 CST on February 23, 2011 because a fuel-rack control pin was incorrectly installed. During this time period, the "B" DG was also inoperable as shown below:

Out of Service	Returned to Service	Reason for Removal from Service
01/17/2011, 0400 CST	01/22/2011, 0940 CST	Seven-day equipment outage for planned maintenance
01/22/2011, 1946 CST	01/23/2011, 0703 CST	Planned maintenance on left-bank air start valve
02/10/2011, 0400 CST	02/11/2011, 1315 CST	Planned DG and Essential Service Water System equipment maintenance outage
02/17/2011, 1127 CST	02/19/2011, 0135 CST	"B" DG Fuel Oil Storage Tank out of compliance with limit on fuel cloud point

When the "A" and "B" DGs are inoperable, there are no remaining stand-by AC sources. Thus, with an assumed loss of offsite electrical power, sufficient stand-by AC sources are not available to power the minimum required ESF functions. Both offsite circuits were operable from December 3, 2010 to February 23, 2011. The Sharpe Station generators, which can provide more than 16 megawatts of power to one ESF bus and train, were also available from December 3, 2010 to February 23, 2011.

Subsequent to the maintenance on the fuel injection pump for the number six cylinder, the "A" DG was operated under load for approximately 4.5 hours on December 5, 2010. Additionally, the "A" DG load run test for Surveillance Requirement 3.8.1.3 was performed satisfactorily twice and the "A" DG was started an additional eight times between December 5, 2010 and February 22, 2011.

OPERATING EXPERIENCE / PREVIOUS EVENTS

LER 2009-005-00: At 1208 Central Daylight Time (CDT) on October 22, 2009, the "A" DG was taken out of service for troubleshooting of abnormal alarm indications and the "B" DG was out of service for maintenance during a refueling outage. This event was reported in accordance with 10 CFR 50.73(a)(2)(v)(B) through (D) as a loss of safety function. A Notification of Unusual Event was declared at 1739 CDT on October 22, 2009 and terminated at 0740 CDT on October 23, 2009. Power to the safety-related busses was supplied by offsite power and all fuel assemblies were in the Spent Fuel Pool.

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On August 24, 2010, Maintenance installed a non-traceable fitting on the "B" DG because personnel failed to verify that the part was listed on the bill of materials before installation. The non-traceable fitting was identified by Maintenance after it leaked during a post-maintenance test and was replaced before the "B" DG was restored to operation. The incorrect installation and subsequent rework extended a Technical Specification Equipment Outage.

Corrective actions associated with these previous events addressed different immediate causes and would not have prevented the current reportable event.

Figure 1 – PC2.5 A-Bank Injection Pump Linkage Illustration
(Blue - Pin Properly Installed, Red – Representative of "As Found" Pin Partially Installed)