WOLF CREEK
NUCLEAR OPERATING CORPORATION

A. J. Camp, Jr
Plant Manager

June 26, 2013

WO 13-0047

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

Reference: Letter WO 09-0048, dated December 21, 2009, from M. W. Sunseri WCNOC, to USNRC

Subject: Docket No. 50-482: Licensee Event Report 2009-005-01, Loss of both Diesel Generators with all fuel in the Spent Fuel Pool

Gentlemen:

The Reference submitted Licensee Event Report (LER) 2009-005-00, "Loss of both Diesel Generators with all fuel in the Spent Fuel Pool." This supplement revises the cause of the loss of both Diesel Generators.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4110, or Mr. Michael J. Westman at (620) 364-4009.

Sincerely,

A. J. Camp, Jr

AJC/rlt

Enclosure:

cc: A. T. Howell (NRC), w/e
C. F. Lyon (NRC), w/e
N. F. O'Keefe (NRC), w/e
Senior Resident Inspector (NRC), w/e

IE22
NRR

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 FOIA/Privacy Service Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resource@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 Loss of both Diesel Generators with all fuel in the Spent Fuel Pool

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
10	22	2009	2009	005	01	06	26	2013	FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE

De-fueled

10. POWER LEVEL

000

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)
Michael Westman, Manager Regulatory Affairs	(620) 364-8831 ext 4009

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	JX	C470	Yes					

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)*

At 1206 CDT on 10/22/2009, with Wolf Creek Generating Station in Refueling Outage 17, Control Room annunciators 20D and 20B for the "A" Diesel Generator (DG) actuated. At 1208 CDT the "A" DG was taken out of service for troubleshooting of abnormal alarm indications. At 1739 CDT on 10/22/2009, a Notification of Unusual Event (NUE) was declared due to the loss of the "A" DG with the "B" DG out of service for refueling outage maintenance. At the time of the event, the reactor vessel was defueled with all fuel located in the Spent Fuel Pool. Power to the safety related busses was being supplied by offsite power.

The root cause of the false speed switch actuation was a wiring error of the speed switch. The control cabinet supplier did not wire the speed switch per the recommendation of the speed switch manufacturer. As a result the speed switch signal wire was not protected from ambient electromagnetic interference. The speed switches were rewired per the manufacturer's recommendation.

The "A" DG was returned to service at 0738 CDT on 10/23/2009. The NUE was exited at 0740 CDT on 10/23/2009.

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PLANT CONDITIONS PRIOR TO EVENT:

MODE - De-fueled
Power- 000

EVENT DESCRIPTION:

At 1206 CDT on 10/22/2009, with Wolf Creek Generating Station (WCGS) in Refueling Outage 17, Control Room annunciators 20D, DG NE01 Trouble, and 20B, DG NE01 UV or UF, for the "A" Diesel Generator (DG) [EIIS Code: EK] actuated. At 1208 CDT the "A" DG was taken out of service for troubleshooting of abnormal alarm indications.

At 1739 CDT on 10/22/2009, a Notification of Unusual Event (NUE) was declared due to the loss of the "A" DG with the "B" DG out of service for refueling outage maintenance. The NUE was delayed due to the licensed operator failure to recognize that "All" Modes in the Emergency Action Level Classification scheme is effective at all times. The delay in the NUE has been entered into the WCGS corrective action program. At the time of the event, the reactor vessel was defueled with all fuel assemblies located in the Spent Fuel Pool. There are no Technical Specifications (TS) requirements for the DGs when defueled. The TS defines Mode as "A MODE shall correspond to any one inclusive combination of core reactivity condition, power level, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel."

Power to the safety related busses were being supplied by offsite power.

The direct cause of the event was the speed switches in the starting circuit of the A DG had actuated due to the failure of the capacitor on the DC input feed to the annunciator power supply. This allowed higher levels of AC noise to be applied to the DC feed to the speed switches. The high AC noise was more than the capacitors on the DC feed to the speed switches could filter out. The AC noise actuated the switches.

The source of electrical noise on the DC supply circuit was traced to the annunicator power supply within the emergency generator gauge board panel. The annunciator power supply and speed switch were replaced on the A DG and the new switch calibrated.

The "A" DG was returned to service at 0738 CDT on 10/23/2009. The NUE was exited at 0740 CDT on 10/23/2009.

Further investigation determined that the root cause of the speed switch actuation was a wiring error of the speed switch. The control cabinet supplier did not wire the speed switch per the recommendation of the speed switch manufacturer. As a result the speed switch signal wire was not protected from ambient electromagnetic interference.

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BASIS FOR REPORTABILITY

This event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(B), (C) and (D) as an event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to: (B) Remove residual heat; (C) Control the release of radioactive material; or (D) Mitigate the consequences of an accident. Specifically, the guidance in NUREG-1022, Rev. 2, states: "Both offsite electrical power (transmission lines) and onsite emergency power (usually diesel generators) are considered to be separate functions by GDC-17. If either offsite power or onsite emergency power is unavailable to the plant, it is reportable regardless of whether the other system is available. GDC-17 defines the safety function of each system as providing sufficient capacity and capability, etc., assuming that the other system is not available."

ROOT CAUSE:

The root cause of the false speed switch actuation was a wiring error of the speed switch. The control cabinet supplier did not wire the speed switch per the recommendation of the speed switch manufacturer. As a result the speed switch signal wire was not protected from ambient electromagnetic interference.

Laboratory testing identified that the termination point of the speed switch signal wire shield had a significant impact on the noise being received (induced) on the signal wire by electromagnetic frequencies (EMF). When wired per the speed switch manufacturer document, the shield provided a significant reduction in the amplitude of received (induced) noise on the signal wire. The reduction of EMF induced noise on the signal wire was so significant, it has been concluded that had the speed switch been wired per the manufacturer document, no false actuation event would have occurred.

CORRECTIVE ACTIONS:

The speed switch termination point has been corrected.

A PM activity was established to have the AC ripple voltage measured at the DC input to the annunciator power supply every three months. If the measured AC ripple voltage reaches a value of 500 milivolts, a work request will be generated to have the power supply replaced.

SAFETY SIGNIFICANCE:

The Outage Control Center performed a shutdown risk assessment on 10/22/2009 after the loss of the DG. The shutdown safety risk condition for the plant was Risk condition 2. Risk condition 2 indicates a moderate risk. There is a reduction in the equipment available for satisfying a shutdown safety function because of electrical power resources and decay heat removal.

The entire core was in the Spent Fuel Pool (SFP) and the SFP water inventory was full. The plant-operating mode was de-fueled. Switchyard activities were not in progress. Power was available from the offsite power sources. The SFP time to boil was 11 hours.

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OPERATING EXPERIENCE/PREVIOUS EVENTS:

LER 2008-004-01 involves a loss of off-site power when the reactor was de-fueled. That event had one source of on-site power available, while this event had off-site power available.