WOLF CREEK
NUCLEAR OPERATING CORPORATION

Russell A. Smith
Site Vice President and Chief Nuclear Operating Officer

November 12, 2013
WO 13-0090

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

Subject: Docket No. 50-482: Licensee Event Report 2013-008-00, "Technical Specification Required Shutdown Due to a Nonfunctional Class 1E Electrical Equipment Air Conditioning Unit"

Gentlemen:

The enclosed Licensee Event Report (LER) is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(A) as a completion of a plant shutdown required by the plant's Technical Specifications. Additionally, this LER is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) for the manual reactor trip and automatic actuation of the auxiliary feedwater system.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4156, or Mr. Michael J. Westman at (620) 364-4009.

Sincerely,

Russell A. Smith

RAS/rlt

Enclosure

cc: C. F. Lyon (NRC), w/e
N. F. O'Keefe (NRC), w/e
S. A. Reynolds (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 Technical Specification Required Shutdown Due to a Nonfunctional Class 1E Electrical Equipment Air Conditioning Unit

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
09	11	2013	2013	008	00	11	12	2013	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE

100

10. POWER LEVEL

1

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) 364-4009

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
D	VI	FLT	Sporlan	Y					

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 September 11, 2013 at 1645 Central Daylight Time (CDT), the Class 1E electrical equipment air conditioning unit, SGK05A, was declared nonfunctional due to low oil level on the SGK05A compressor, elevated vibration and an increase in motor current. As a result, Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.3 was entered and a plant shutdown was commenced. Mode 3 was entered on September 11, 2013 at 2312 CDT.

Following the plant shutdown, while in Mode 3, the 'A' steam generator (SG) level approached the Auxiliary Feedwater Actuation Signal setpoint of 23.5 % level. The Control Room operators initiated a manual reactor trip. As a result of the trip, a feedwater isolation signal and a motor-driven auxiliary feedwater actuation signal was generated.

The cause of the SGK05A failure was an inadequate flush and restoration of the system following actions taken to restore SGK05A in May 2013. The cause of the manual reactor trip and auxiliary feedwater actuation was the lack of crew proficiency to maintain SG levels in Mode 3, immediately following a rapid shutdown.

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PLANT CONDITIONS AT THE TIME OF THE EVENT

100 %
Mode 1
There were no structures, components or systems (SSC) that were inoperable at the start of the event and contributed to the event.

DESCRIPTION OF THE EVENT

During Operator rounds on September 11, 2013, low oil level on the 'A' train Class 1E electrical equipment air conditioning (A/C) unit [EIIS: VI, ACU] (SGK05A) compressor, elevated vibration and an increase in motor current was observed. The compressor refrigeration parameters (suction pressure, discharge pressure, oil pressure, thermostatic expansion valve [EIIS: VI, TCV] (TXV) superheat) were running normal and the room temperatures were being maintained. It was determined that the symptoms were similar to a June 2013 compressor failure reported in LER 2013-007-00. SGK05A was declared nonfunctional per Technical Requirement (TR) 3.7.23, "Class 1E Electrical Equipment Air-Conditioning (A/C)." TR 3.7.23 requires two Class 1E electrical equipment A/C trains be functional in Modes 1 through 4. Because of the essential support function provided by the Class 1E electrical equipment A/C trains, the correct application of the Technical Specification (TS), upon discovery of a nonfunctional Class 1E electrical equipment A/C train, is to immediately enter the applicable Conditions and Required Actions under TS 3.8.4, TS 3.8.7, TS 3.8.9, as well as Limiting Condition for Operation (LCO) 3.0.3. On September 11, 2013 at 1645 Central Daylight Time (CDT), the plant entered LCO 3.0.3.

A plant shutdown was commenced on September 11, 2013 at 1645 CDT. Wolf Creek Generating Station (WCGS) entered Mode 3 on September 11, 2013 at 2312 CDT.

Following the plant shutdown, while in Mode 3, the 'A' steam generator (SG) level [EIIS: SB, LI] was observed approaching the Auxiliary Feedwater Actuation Signal (AFAS) setpoint of 23.5 % level. The Control Room operators initiated a manual reactor trip. As a result of the trip, a feedwater isolation signal (FWIS) and a motor-driven AFAS was generated.

After the actuation, SG levels were controlled by manually adjusting the auxiliary feedwater pump discharge valves [EIIS: BA, V].

Work on 'A' train Class 1E electrical equipment A/C unit was completed and the unit returned to a functional status on September 26, 2013 at 2316 CDT. WCGS returned to Mode 1 on September 29, 2013 at 1632 CDT.

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BASIS FOR REPORTABILITY

10 CFR 50.73(a)(2)(i)(A) requires reporting "the completion of any nuclear plant shutdown required by the plant's Technical Specifications." A shutdown of the plant was completed per LCO 3.0.3. Additionally, a 4-hour notification was made per 10 CFR 50.72(b)(2)(i) when the plant shutdown was initiated.

10 CFR 50.73(a)(2)(iv)(A) requires reporting "any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B)." A manual reactor trip was initiated that actuated the Reactor Protection System and the PWR auxiliary feedwater system actuated.

ROOT CAUSE

The direct cause of the SGK05A compressor failure occurred from a liquid slug drawn into the compressor resulting in a sudden over pressurization in the cylinder compression volume. One or more thermostatic expansion valves [EIIS: VI, TCV] (TXVs) failed open intermittently due to residue on the valve internals. The root cause is that inadequate actions, specifically the chemical flush and evacuation of the system, were taken to restore SGK05A in May 2013. In May 2013, a chemical flush was performed after the failure of a filter-drier [EIIS: VI, FLT] in the system allowed filter element material to enter the refrigerant stream resulting in blockage of the TXVs. This was reported in LER 2013-006-01.

The apparent cause of the manual reactor trip and auxiliary feedwater actuation was the lack of crew proficiency to maintain SG levels in Mode 3, immediately following a rapid shutdown.

CORRECTIVE ACTIONS

The SGK05A compressor was replaced. The evaporator TXV internals and hot gas bypass valve internals were replaced. Internal inspections were conducted with a boroscope that verified there was no internal contamination.

Procedure MPE GK-004, "GK Unit Preparation for Work," will be revised to include critical steps that are important for ensuring an effective flush and evacuation of the Class 1E electrical equipment A/C system.

The operator training cycle that commenced October 28, 2013, includes a simulator training scenario addressing the control of SG levels following a rapid plant shutdown.

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SAFETY SIGNIFICANCE

The Class 1E electrical equipment A/C system operates in a continuous recirculation mode to maintain the engineered safety features (ESF) switchgear rooms [EIIS: EB, SWGR], battery rooms [EIIS: EJ, BTRY] and the DC switchgear rooms [EIIS: EJ, SWGR] at or below the design temperature of 90 degrees F during all modes of plant operation, including loss of preferred offsite power and post-accident operation. The safety significance of this event is low since only one train of Class 1E electrical equipment was potentially affected. The 'B' train Class 1E electrical equipment A/C unit, SGK05B, was not affected and remained functional, and its associated train of Class 1E electrical equipment was operable. Additionally, the 'A' train Class 1E electrical equipment room temperatures, cooled by SGK05A, remained below 90 degrees F.

OPERATING EXPERIENCE/PREVIOUS SIMILAR OCCURRENCES

LER 2012-005-00 reported a Class 1E electrical equipment A/C train was declared nonfunctional due to a calculation that concluded one train of air conditioning was not capable of supporting both trains of Class 1E equipment. Technical Requirement (TR) 3.7.23 allowed a train to be nonfunctional if compensatory measures were established for the affected unit. During the operability determination and functionality assessment process, it was determined that the operability of the associated train Class 1E electrical equipment could not be maintained without additional compensatory measures and for a limited period of time.

LER 2013-004-00 reported one train of Class 1E electrical equipment air conditioning had been nonfunctional and one train of control room air conditioning had been inoperable during the previous cycle. This was discovered during refueling outage 19 when the SGK05A compressor terminal box mounting screws were found over torqued. This resulted in a condition prohibited by Technical Specification and a condition that could have prevented the fulfillment of a safety function.

LER 2013-006-01 reported one train of Class 1E electrical equipment air conditioning had been nonfunctional due to a partial blockage of the TXVs feeding the SGK05A evaporator coils. Failure of a filter-drier in the system created the contamination that led to the blockage. This resulted in a plant shutdown required by Technical Specifications.

LER 2013-007-00 reported one train of Class 1E electrical equipment air conditioning had been nonfunctional due to an analysis of an oil sample that showed elevated levels of aluminum. The NRC granted enforcement discretion that allowed the plant to remain at power while the train was restored to functional status.