WOLF CREEK
NUCLEAR OPERATING CORPORATION

Gary B. Fader
Vice President Technical Services

OCT 2 4 2002

ET 02-0047

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

Subject: Docket No. 50-482: Licensee Event Report 2002-005-00, Engineered Safety Features Actuation including Emergency Diesel Generator Start.

Gentlemen:

The enclosed Licensee Event Report (LER) 2002-005-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) regarding an Engineered Safety Feature Actuation at Wolf Creek Generating Station.

Wolf Creek Nuclear Operating Corporation has made no commitments in the enclosed LER.

If you should have any questions regarding this submittal, please contact me at (620) 364-4034 or Mr. Tony Harris at (620) 364-4038.

Very truly yours,

Gary B. Fader

GBF/rlg

Enclosure

cc: J. N. Donohew (NRC), w/e
D. N. Graves (NRC), w/e
E. W. Merschoff (NRC), w/e
Senior Resident Inspector (NRC), w/e

IE22

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request. 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U S Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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

Engineered Safety Features Actuation including Emergency Diesel Generator Start

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
09	09	2002	2002	- 005 --	00	10	24	2002	FACILITY NAME	DOCKET NUMBER

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)(ii)		50 73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)	x	50.73(a)(2)(iv)(A)		73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		
	20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)		
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Karl A. (Tony) Harris, Manager Regulatory Affairs	(620) 364-4038

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
X	JE	IMOD	C560	YES					

14. SUPPLEMENTAL REPORT EXPECTED			15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

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

On September 9, 2002, at 3:58 p.m. Central Daylight Time (CDT), Wolf Creek Generating Station (WCGS) experienced a Degraded Voltage signal on Emergency Power Bus NB01 causing an automatic actuation of the "A" Emergency Diesel Generator ("A" EDG) and the associated Load Shedder and Emergency Load Sequencer (LSELS). The cause of the degraded voltage signal was determined to be due to a hardware failure in an electronic relay driver card in the LSELS degraded voltage circuitry. An actual degraded emergency bus voltage situation did not exist.

The safety significance of this event is low. All safety related equipment responded to the actuation signal as expected. There were no adverse effects on the health and safety of the public.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

Background:

Power to Engineered Safety Features (ESF – System SA) [EIIS Code: JE] buses NB01 and NB02 (NB) [EIIS Code: EB] is normally provided from off-site sources via dedicated ESF transformers and normal feeder breakers. Each ESF bus also has an emergency power source available from an onsite Emergency Diesel Generator (EDG) [EIIS Code: EK], which is designed to start automatically on an undervoltage signal and load onto the bus. When a diesel generator successfully loads onto an affected ESF bus, the Load Shedder Emergency Load Sequencer (LSELS – System NF) [EIIS Code: EK] for that bus will automatically start predetermined loads at programmed time intervals.

Plant Conditions Prior to the Event:

MODE – 1
Power – 100 Percent
Normal Operating Temperature and Pressure

Event Description:

On September 9, 2002, at 3:59 p.m., the Control Room received an alarm indicating the existence of a degraded voltage condition on bus NB01. Bus voltage was immediately verified to be normal. Approximately 90 seconds later, when the degraded voltage alarm had not cleared, the normal feeder breaker to NB01 opened, resulting in loss of power to the bus. The "A" EDG started and loaded onto the bus as expected. The LSELS started loads as required on the shutdown sequencer, including the "A" Centrifugal Charging Pump (CCP) [EIIS Code: BQ], and the "A" Motor Driven Auxiliary Feedwater Pump [EIIS Code: BA]. Also, the undervoltage condition on NB01 resulted in an automatic start of the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) [EIIS Code: BA], as designed.

After the NB01 bus voltage was returned to normal by the EDG, the degraded voltage alarm remained actuated, indicating a circuit failure. All safety related equipment performed as designed. The ESF Systems performed as required. Control Room Operators immediately began a power reduction to compensate for the reactivity addition caused by the addition of auxiliary feedwater to the Steam Generators. The power reduction was completed at 5:03 p.m., and at 5:10 p.m., the TDAFWP was secured. Other than one unrelated slave relay surveillance test in progress on Train 'A' Steam Line Isolation, there were no structures, systems, or components (SSCs) out of service that contributed to this event.

Basis for Reportability:

The actuation of ESF Systems described in this event is reportable per 10 CFR 50.73(a)(2)(iv)(A), which states, in part, that the Licensee shall report "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." The systems involved are Emergency Diesel Generators and Auxiliary Feedwater.

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17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

Root Cause:

The failure that initiated the degraded voltage alarm and subsequent opening of the normal feeder breaker to bus NB01 has been identified as occurring in an integrated circuit (IC) on a relay driver board in the NF039A cabinet. Specifically, a logic gate between pins 4, 6 and 7 in the "U1" IC on relay driver board #17 in the NF039A cabinet experienced a hardware failure to a logic HI condition. This caused LSELS output relays 1148 and 1149 to energize and trip the NB01 feeder breakers.

Corrective Actions:

Troubleshooting activities performed following this event concluded that the failure of the "U1" chip on the relay driver board described in the root cause was the initiator of this event, and was classified as a random failure of an electronic semi-conductor integrated circuit. Following successful testing of a replacement board, it was installed and the system restored to service. LSELS was declared operable at 11:53 p.m. on September 9, 2002.

Safety Significance:

The safety significance of this event is low. This event is bounded by the current licensing basis analysis as reported in Wolf Creek Generating Station (WCGS) Updated Safety Analysis Report (USAR), section 8.3.1, "AC Power Systems", as indicated in Table 8.3.4. All safety related equipment performed as designed and there were no adverse effects on the health and safety of the public.

Previous Events:

Research into the corrective action program database was conducted for keywords "LSELS" and "sequencer", as well as systems NF and SA. No similar failures were found, nor were any other ESF actuations found attributed to these electronic cards. There are sixty (60) cards of this type used at WCGS. They are all used in the NF and SA systems. Twenty-eight (28) are used in the NF cabinets, and thirty-two (32) are used in the SA cabinets. There have been six (6) failures in seventeen (17) years. The reliability of these boards, over a one-year period, is 99.4%. Three of these failures have occurred in NF039A, two in SA075B and one in the SA075A cabinet. One failure occurred in 1988, one in 1992, one in 1993, one in 2001 and two in 2002. To date, this event has been the only significant incident resulting from a failure of these electronic cards. The other failures have been minor equipment failures and were corrected under the work controls process.