

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Otto L. Maynard  
Vice President Plant Operations

February 1, 1996  
WO 96-0007

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Station P1-137  
Washington, D. C. 20555

Reference: Letter WO 95-0170, dated December 7, 1995, from  
O. L. Maynard, WCNO to NRC  
Subject: Docket No. 50-482: Licensee Event Report 95-006-01

Gentlemen:

The attached revised Licensee Event Report is being submitted pursuant to 10 CFR 50.73 (a) (2) (iv) concerning an Engineered Safety Features actuation. This report includes information obtained from an engineering evaluation that was still ongoing at the time of the original submittal.

If you should have any questions regarding this submittal, please contact me at (316) 364-8831 extension 4450, or William M. Lindsay at extension 8760.

Very truly yours,



Otto L. Maynard

OLM/jad

Attachment

cc: L. J. Callan (NRC), w/a  
W. D. Johnson (NRC), w/a  
J. F. Ringwald (NRC), w/a  
J. C. Stone (NRC), w/a

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**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

WOLF CREEK GENERATING STATION

DOCKET NUMBER (2)

05000482

PAGE (3)

1 OF 7

TITLE (4)

Loss of Emergency Bus NB02 Due to Degraded Gasket on Motor Operator Cabinet

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	10	95	95	006	01	2	1	96	FACILITY NAME	DOCKET NUMBER
OPERATING		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
			20.402(b)			20.405(c)		X	50.73(a)(2)(iv)	73.71(b)
POWER		100%	20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)	73.71(c)
			20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)	OTHER
			20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)	
			20.405(a)(1)(iv)			50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)	
			20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME William M. Lindsay Manager Performance Assessment	TELEPHONE NUMBER (Include Area Code) 316-364-8760
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
C	FK	Gasket		No					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, completed EXPECTED SUBMISSION DATE)	X	NO	EXPECTED	MONTH	DAY	YEAR
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**ABSTRACT:**

On November 10, 1995, at 1942 CST, Wolf Creek Generating Station (WCGS) experienced a seepage of moisture (snow, ice, sleet) into the motor operator cabinet, for air break disconnect 345-163. The cabinet is located in the WCGS switchyard. This intrusion caused a loss of offsite power to the West Bus in the switchyard and a loss of power to the Start-up Transformer that supplies the Engineered Safety Features Transformer, XNB02. The XNB02 Transformer is the power supply for the Emergency Bus, NB02. The loss of power caused the Emergency Diesel Generator "B" to auto-start and load through the actuation of the "B" shutdown sequencer as a result of the Emergency Bus (NB02) bus undervoltage. The Turbine Driven Auxiliary Feedwater Pump also auto-started as a result of the undervoltage. The momentary loss of power to several radiation monitors initiated a Control Room Ventilation Isolation Signal, Containment Purge Isolation Signal and Fuel Building Isolation Signal.

The non-nuclear utility personnel responsible for maintenance of the switchyard responded to the plant and determined that moisture caused open contacts to short and ultimately open air break disconnect 345-163. To prevent a similar occurrence, power was removed from all air break disconnect motor operators. This additional corrective action was completed on November 13, 1995, and remained in place until cabinet inspections were completed. This revision incorporates the results of an evaluation conducted by System Engineering into the gasket failure and the inspections/repair work performed by System Operations personnel.

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TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORD REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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Wolf Creek Generating Station	05000482	95	006	01	2 OF 7

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

**PLANT CONDITIONS AT TIME OF EVENT**

Plant Operational Condition: Mode 1  
Plant Power Level 100%

**BASIS FOR REPORTABILITY**

On November 10, 1995, at 1942 CST, air break disconnect 345-163 opened causing a loss of offsite power to the West Bus in the Wolf Creek Generating Station (WCGS) switchyard [FK]. Power was subsequently lost to the Start-up Transformer and the Engineered Safety Features (ESF) Transformer, XNB02 [EB-XFMR], which supplies Emergency Bus, NB02 [EB-BUS]. The bus undervoltage caused Emergency Diesel Generator (EDG) [EK-DG] "B" to auto-start and load through the actuation of the "B" Shutdown Sequencer [JE-STC]. The Turbine Driven Auxiliary Feedwater Pump [BA-P] also auto-started as a result of the bus undervoltage. The bus undervoltage was a valid ESF actuation signal. The required four hour report to the NRC Operations Center was made at 2313 CST, pursuant to 10 CFR 50.72 (b)(2)(ii). This event is being reported pursuant to 10 CFR 50.73 (a)(2)(iv) as a condition resulting in automatic actuation of Engineered Safety Features.

**DESCRIPTION OF EVENT**

At 1942 CST, on November 10, 1995, a degraded gasket allowed moisture (snow, ice, sleet) to intrude into the motor operator cabinet [CAB] for air break disconnect [DISC] 345-163. The cabinet is located in the WCGS switchyard. The moisture caused open contacts to short which energized the motor and opened air break disconnect 345-163. The disconnect opened with the line energized. Air break disconnect 345-163 is an electrically operated switch designed to be operated, either locally or remotely, under no load conditions. When air break disconnect 345-163 opened, power from the switchyard was lost to the Start-up Transformer and ESF Transformer (XNB02), which supplies the Emergency Bus (NB02). Three breakers (345-70, 345-40, and 345-110) [BKR] opened in the switchyard on the differential relay trip completely de-energizing the West Bus (Reference Figure 1).

Due to the ring bus configuration of the switchyard, the grid distribution transmission lines were not de-energized and no power outages to the public resulted. Equipment response to the event was as designed and all emergency systems operated as expected. The loss of power to XNB02 caused the "B" EDG to start and load through the "B" Shutdown Sequencer. The loss of NB02 voltage caused an Auxiliary Feedwater [BA] Actuation System

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AFAS) Signal. The AFAS Signal caused the Turbine Driven Auxiliary Feedwater Pump and caused a Steam Generator [AB-SG] to go down and Sample Isolation. The momentary loss of power to several radiation monitors [IL-MON] caused the following signals to be activated: Control Room Ventilation Isolation, Containment [NH] Purge Isolation and Fuel Building [ND] Isolation.

At the time of the event, NB02 was the only load on the Start-up Transformer, approximately 2 MW. The Unit Auxiliary Transformer carries the majority of the load while WCGS is at power. WCGS Control Room Operators responded to the event through established Off-Normal and Alarm Procedures.

On November 10, 1995, at 2100 CST, WCGS Electrical Maintenance personnel inspected all affected switchyard equipment and transformers. There was no apparent damage. At 2300 CST, a Western Resources System Operations Crew entered the switchyard and inspected the disconnect. No obvious damage was found. On November 11, 1995, at 0435 CST, a Western Resources System Operations relay team responded to WCGS to aid investigation efforts. They discovered a worn gasket on the motor operator cabinet door for air break disconnect 345-163. The degraded gasket allowed moisture to intrude into the cabinet shorting out the contacts and ultimately causing air break disconnect 345-163 to spuriously open. At 0622 CST, Western Resources System Operations personnel repaired the motor operator door gasket. At 0644 CST, the "B" EDG was removed from NB02, thereby restoring the normal electrical distribution lineup.

Technical Specification 3.8.1.1 action (a) was entered due to the loss of one of the required circuits between the Offsite Distribution System and the Onsite Class 1E Distribution System. The required verification of the other circuits between distribution systems within one hour and restoration of the lost circuit within 72 hours was completed satisfactorily.

The "B" Motor Driven Auxiliary Feedwater Pump (AFP) [BA-P] started during the loading of the "B" EDG through the "B" Shutdown Sequencer. Operators removed the "B" AFP from service and placed it in pull-to-lock. Placing "B" AFP in pull-to-lock was required because the Shutdown Sequencer was "locked in" until normal power was restored and the Shutdown Sequencer reset. Technical Specification 3.7.1.2 action (a) was entered and required restoration within 72 hours. On November 11, 1995, at 0638 CST, the "B" AFP was restored to service.



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Root Cause

From discussions with System Operations personnel it was determined that they were aware of the condition of the door gaskets prior to November 7, 1995. Control Room logs for November 7, 1995, three days prior to the event, indicate that System Operations personnel entered the switchyard to survey and possibly perform door repairs. System Operations personnel discussed their findings with Control Room personnel on November 7, 1995, but no repair work was allowed at that time. The work was not scheduled in advance as required by WCNO procedure KGP-1400, "Substation Switchyard Protection," step 6.1.2.1, which states that Western Resources personnel should identify pending work to their WCGS counterpart and give notice thirty days prior to requiring access during normal WCGS operations. Procedure KGP-1400 also states in step 6.2.2, that prior to beginning work, the necessary work authorizations and clearances shall be obtained. WCNO personnel were not contacted prior to November 7, 1995, and an authorization form was not generated.

WCNO Control Room and Electrical Maintenance personnel made the decision not to allow work to be performed until the full scope of work was identified, the work properly scheduled and the risk significance to the plant evaluated.

The root cause of this event is personnel error in that established work control procedures were not followed. Failure to follow procedure KGP-1400 and generate an authorization form when the degraded door gasket was first discovered prevented the gasket from being repaired on November 7, 1995. Additionally, although the possibility of moisture intrusion into the cabinet was communicated to the Control Room, the need for prompt repair work was not, and subsequently WCNO missed the opportunity to take precautionary measures.

Corrective Actions Completed

As an immediate corrective action, the motor operator cabinet door gasket was repaired. To prevent a similar occurrence, power was removed from all air break disconnect motor operators. This additional corrective action was initiated on November 11, and completed by November 13, 1995.

A Western Resources System Operations crew re-inspected the motor operator cabinet door gasket and air break disconnect 345-163 on November 15, 1995. Nineteen motor operator cabinets in the WCGS switchyard were inspected for similar degradation. Approximately one-half of the air break disconnect cabinets had gasket degradation and required gasket

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replacement. Minor repairs were also made to other cabinet doors and gaskets. The crew also went through the circuitry for air break disconnect 345-163 and found everything functional. The power was restored to the motor operators on December 1, 1995.

Performance Improvement Request 95-2716 was initiated to evaluate the gasket failure. As part of the scope of the evaluation, the inspections performed by Western Resources System Operations personnel were reviewed to determine if the gaskets require inspection on a more frequent basis. System Engineering completed their evaluation of this event on December 13, 1995. System Engineering concluded that the current level of inspection had identified the degrading gaskets, and that no change in System Operation's inspection practice is required.

On December 29, 1995, WCNOG sent a letter to Western Resources System Operations personnel stressing the need for adherence to work control procedures pertaining to switchyard maintenance. The importance of timely corrective action and the consequences on plant equipment that may occur if timely corrective action is not taken was emphasized. The letter also stressed the need for good communication with Control Room personnel in regard to the discovery of degraded components.

In the future, the WCNOG Central Work Authority (CWA) will coordinate and schedule all switchyard (non-emergency) work. The CWA will contact the appropriate maintenance work group for resolution. Switchyard work will receive the proper evaluation (risk analysis) and be included as part of the normal WCNOG work control process. Emergency work will be coordinated through the WCNOG Control Room. Procedure KGP-1400 (superseded by AP 21C-001, "Substation Protection") was revised to include these changes. System Operations personnel were sent a copy of the revised procedure by facsimile on January 26, 1996.

**Safety Significance**

There were no safety related systems out-of-service or safety related components being tested prior to or during this event that impacted the ability of the operators to safely respond to the loss of offsite power. All plant systems responded as designed. At no time did conditions develop that may have posed a threat to the safety of the plant or a threat to the health and safety of the public.

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Similar Occurrences

There have been no previous occurrences in which degradation of a gasket on a motor cabinet door caused a loss of offsite power and actuation of engineered safety features.

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**Figure 1**

