WOLF CREEK
NUCLEAR OPERATING CORPORATION

John A. Bailey
Vice President
Nuclear Operations

April 13, 1990
NO 90-0118

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

Subject: Docket No. 50-482: Licensee Event Report 90-002-00

Gentlemen:

The attached Licensee Event Report (LER) is submitted pursuant to 10 CFR 50.73 (a) (2) (v) as a condition that alone could have prevented the fulfillment of a safety function.

Very truly yours,

John A. Bailey
Vice President
Nuclear Operations

JAB/jra

Attachment

cc: R. D. Martin (NRC), w/a
D. Persinko (NRC), w/a
D. V. Pickett (NRC), w/a
M. E. Skow (NRC), w/a

IE22
1/1

NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Wolf Creek Generating Station	0 5 0 0 0 4 8 2	1 OF 0 4

TITLE (4)
Lack Of Design Criteria Leads To Logic In Which Actuation Of A Fire Suppression System Affects Both Trains Of Safety Related Equipment

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 3	1 4	9 0	9 0	0 0 2	0 0					0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 5

POWER LEVEL (10): 1 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

	20.402(b)		20.406(c)		50.73(a)(2)(iv)		73.71(b)
	20.406(a)(1)(i)		50.36(c)(1)	X	50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		
	20.406(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.406(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Merlin G. Williams - Manager Plant Support	AREA CODE 3 1 6 — 3 6 4 - 8 8 3 1

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	

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On March 14, 1990, following a discussion with personnel from another utility, it was determined that a Halon release in either Engineered Safety Features (ESF) Switchgear Room would trip both Class 1E Electrical Equipment Air Conditioning Units. As an initial corrective action, the affected Halon release circuits were disabled and a fire watch was established for both ESF Switchgear Rooms. A permanent design change has been developed to alter the circuitry such that only the associated Air Conditioning Unit will be secured in the event of a Halon release.

The root cause of this event was the lack of design criteria to clarify the train separation requirements of nonsafety related/special scope logic signals which actuate multiple trains of safety related equipment. The design criteria have been revised to include these requirements. A review has been conducted of all circuitry potentially affected by this lack of design criteria. No additional design deficiencies were identified during the review.

INTRODUCTION

On March 14, 1990, following a discussion with personnel from another utility, it was determined that a Halon release in either Engineered Safety Features (ESF) Switchgear [JE] Room would trip both Class 1E Electrical Equipment Air Conditioning Units [NA-ACU]. As an initial corrective action, the affected Halon release circuits were disabled and a fire watch was established for both ESF Switchgear Rooms. This condition is being reported pursuant to 10CFR50.73(a)(2)(v) as a condition that alone could have prevented the fulfillment of a safety function.

DESCRIPTION OF EVENT

On March 14, 1990, during a conversation with personnel from another utility, Wolf Creek Nuclear Operating Corporation (WCNOC) engineering personnel were notified of a potential design deficiency in that actuation of the Halon Fire Suppression System in one ESF Switchgear Room would trip the Class 1E Electrical Equipment Air Conditioning Units in both ESF Switchgear Rooms. WCNOC engineering personnel subsequently confirmed that the condition also existed at Wolf Creek Generating Station. Per design documentation, one Halon release auxiliary relay contact from each ESF Switchgear Room was wired to each of the Class 1E Electrical Equipment Air Conditioning Units auxiliary relays. This wiring configuration would have resulted in a shutdown of both Air Conditioning Units in the event of actuation of the Halon Fire Suppression System in either of the ESF Switchgear Rooms. Furthermore, this logic would override the Class 1E Electrical Equipment Air Conditioning Units start signal that would be initiated by a Control Room Ventilation Isolation Signal or a Load Shed/Emergency Load Sequencer Actuation Signal.

At the time of this discovery, the unit was in Mode 5, Cold Shutdown. At approximately 1638 CST, the Halon Fire Suppression System Controls for both ESF Switchgear Rooms were placed in inhibit and firewatches were established for the affected areas in accordance with administrative procedures. As a long term corrective action, a permanent plant modification has been developed to make wiring changes to the Halon shutdown contacts. The wiring change will allow for a Halon Fire Suppression System actuation to trip only the Class 1E Air Conditioning Unit for the affected ESF Switchgear Room. Following implementation of this design change, the Halon control circuitry will be restored to operation.

The root cause of this situation was the lack of stated design criteria to clarify the train separation of nonsafety related/special scope logic signals which actuate the logic for multiple trains of safety related equipment. The design basis requirement for isolation of the Class 1E Electrical Equipment Air Conditioning Units was to ensure proper ESF Switchgear Room Halon concentration. This requirement was satisfied by wiring one auxiliary relay contact from each of the ESF Switchgear Room Halon release circuits to each Class 1E Electrical Equipment Air Conditioning Unit. In the design of the Halon release circuit, the physical and electrical separation requirements were met, but there was no design requirement to check the circuit logic to confirm that there was no adverse train interaction. It was determined that the only affected circuits were those in which a safety related circuit would be actuated from a nonsafety related/special scope logic signal through an isolation device.

WCNOC engineering personnel have reviewed the schematic diagrams and logic diagrams of all the auxiliary relays used as isolation devices. As a result of this review, it was concluded that no other similar design deficiencies exist at Wolf Creek Generating Station.

In order to prevent future occurrences of this nature, the design criteria have been revised to include a statement that system logic between nonsafety related/special scope circuits and safety related circuits must be configured to prevent adverse actuations of multiple trains of safety related equipment.

ADDITIONAL INFORMATION

The safety related function of the Class 1E Electrical Equipment Air Conditioning Units is to operate in a continuous recirculation mode to maintain the ESF Switchgear room, the battery rooms, and the DC Switchgear rooms at or below the design temperature. While the refrigeration subsystem is in operation, the amount of cooling provided is self-regulated by the Air Conditioning Unit control circuit. The principal control functions are provided by a temperature switch/step controller which automatically starts and stops the Air Conditioning Units as required. Indication of a loss of preferred AC power, or a loss-of-coolant accident will automatically initiate the Class 1E Electrical Equipment Air Conditioning System if not already in operation. However, the design function of this system was overridden by a Halon release in either of the ESF switchgear rooms, associated battery rooms, or associated DC switchgear rooms. By making the

wiring changes, the system will then be designed per the original operational intent and thus only the Air Conditioning Unit associated with the room in which a Halon release has occurred will be stopped.

An evaluation of the consequences of a fire or a false actuation in one of the ESF Switchgear Rooms has determined that no significant adverse effects would have occurred to prevent the mitigation of an event. Although both Air Conditioning Units would have been removed from service, once the fire had been extinguished, the Halon system would be reset per procedure. By resetting the Halon System, both Air Conditioning Units would be returned to service.

There have been no previous similar occurrences.