



February 19, 1991

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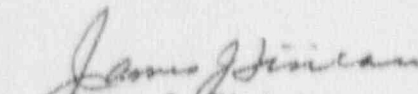
U. S. Nuclear Regulatory Commission
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SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report 50-368/91-002-00

Gentlemen:

In accordance with 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(ii)(B), attached is the subject report concerning a design deficiency which resulted in the potential for failure of the emergency diesel generators due to inoperability of the room exhaust fans.

Very truly yours,


James I. Fisicaro
Manager, Licensing

JJF/LAT/mmg
Attachment

cc: Regional Administrator
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U. S. Nuclear Regulatory Commission
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two

DOCKET NUMBER (2) PAGE (3)
 050003 681 OF 04

TITLE (4) Design Deficiency Results In Potential For Failure Of Emergency Diesel Generators Due To Inoperability Of Room Exhaust Fans

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	1	1	89	1	9	1	--	0	0	2	--	0	0	0	0	2	1	9	9	1		050003

CHECKING NOTE (9) THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:

(Check one or more of the following) (11)

POWER LEVEL (30)	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(c)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(ix)	73.71(b)	73.71(c)	Other (Specify in Abstract below and in Text, NRC Form 366A)	
0	9	5																					

LICENSEE CONTACT FOR THIS LER (12)

Name	Telephone Number
Larry A. Taylor, Nuclear Safety and Licensing Specialist	Area Code: 501 964-5000

USE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

Cause	System	Component	Manufacturer	Reportable to NRC	Cause	System	Component	Manufacturer	Reportable to NRC

SUPPLEMENT REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)	Month	Day	Year
<input checked="" type="checkbox"/> Yes (If yes, complete Expected Submission Date) <input type="checkbox"/> No			

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

On January 18, 1991, while performing inspections of vital, 480 volt AC, Motor Control Center breakers, the control power transformers (CPTs) in the breakers for the emergency diesel generator (EDG) rooms exhaust fans were found to be undersized. Evaluation of the design deficiency concluded that proper operation of the exhaust fans could not be assured under certain conditions of degraded offsite power voltage. Since the exhaust fans are needed to ensure proper operation of the EDGs, both ANO-2 EDGs were declared to be inoperable. Operating handswitches in the Control Room for one exhaust fan in each EDG room were placed in the 'off' position to prevent automatic starting of the fans. It was determined that the fans could be started manually if required and would not be susceptible to failure if the EDGs were supplying power to the vital electrical busses. Based on this action, both EDGs were declared operable. The undersized CPTs were replaced. The cause of this event appears to be the failure to identify the incorrect CPT size during previous design reviews due to an incorrect vendor drawing for the equipment. A plant electrical design drawing has been revised to indicate the correct CPT size for each applicable breaker.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		Sequential Number		Revision Number				
		Year						
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

A. Plant Status

At the time of occurrence of this event, Arkansas Nuclear One, Unit Two (ANO-2) was operating at 95 percent of rated thermal power in Mode 1 (Power Operations). Reactor Coolant System (RCS) [AB] pressure was approximately 2250 psia and RCS temperature was about 580 degrees Fahrenheit.

B. Event Description

On January 18, 1991, while performing inspections of vital, 480 volt AC, Motor Control Center breakers [ED] as the result of a plant electrical drawing upgrade project, the control power transformers (CPTs) installed in the breakers for the emergency diesel generator (EDG) [EK] rooms exhaust fans (2VEF-24A, B, C and D) were found to be undersized. Based on an evaluation of the design deficiency, Design Engineering personnel concluded that proper operation of the breakers and therefore the EDG exhaust fans could not be assured under certain postulated conditions of degraded offsite power voltage. Therefore, the exhaust fans for both EDG rooms were declared to be inoperable. Since the room exhaust fans are necessary support equipment to ensure proper operation of the EDGs, at 1600 hours on January 18, 1991, both ANO-2 EDGs were declared to be inoperable and the applicable Technical Specification action statement was entered. At 1616 hours the operating handswitches in the Control Room for one exhaust fan in each EDG room were placed in the 'off' position to prevent automatic starting of the fans. It was determined that the fans would not be susceptible to failure if the EDGs were supplying power to the vital electrical busses. Instructions were provided to Operations personnel to isolate the vital busses from offsite power and supply the busses using the EDGs if necessary. The exhaust fans being maintained in the 'off' position could then be manually started to provide room cooling. Based on this action, both EDGs were declared operable at this time.

C. Root Cause

In 1978, prior to initial operation of ANO-2, Engineering reviews were performed to determine the capability of safety-related electrical equipment to function under conditions of degraded voltage on the vital electrical busses. As a result of these reviews, several control power circuits in electrical breakers to components were modified by increasing the size of the CPTs and/or adding interposing relays to the circuits to ensure proper operation under minimum postulated voltage conditions. Following discovery of the undersized CPTs in the breakers for the EDG rooms exhaust fans, a detailed review of plant records, was performed; however, the root cause for the design deficiency could not be conclusively determined. The most probable cause was that the breakers for the exhaust fans were originally received at ANO and installed in the plant with a size 2 starter and 50 VA CPT. The vendor drawing for the motor control center used during the equipment design reviews in 1978 did not accurately reflect this configuration and was never changed to indicate the correct starter and CPT sizes, therefore, the deficiency was not identified during these reviews.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Arkansas Nuclear One, Unit Two	05000368	9	1	--	0	0	2	--	0	0	050004

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

D. Corrective Actions

The undersized CPTs were replaced with larger units (100 VA CPTs) which will ensure proper operation of the fans under all required conditions.

Inspections of other vital 480 volt AC, safety-related breakers in MCC on both units at ANO have been completed. Reviews of the associated components have been completed and it has been verified that the equipment will function properly under degraded voltage conditions.

A plant electrical design drawing (E-2086) has been revised to indicate the correct CPT size for each applicable MCC breaker. Additionally, a memorandum has been issued to ensure design and maintenance personnel are cognizant of the CPT sizing concern.

E. Safety Significance

The vital electrical busses are used to provide power to plant components and systems needed to mitigate the consequences of transients and accidents and to equipment necessary to maintain safe shutdown conditions. Following occurrence of an event, the busses are normally energized from the offsite power system; however, should a loss of offsite power or a degraded offsite power condition occur, undervoltage relaying will automatically disconnect the vital busses from the offsite power system. The EDGs are automatically started and used to supply power to the vital busses under these conditions. The EDGs also receive a signal to automatically start upon initiation of a Safety Injection Actuation Signal (SIAS) from the Plant Protection System [JC]. If voltage on the vital busses is degraded but remains above the actuation setpoint of the under voltage relays, the EDGs will operate in a running standing mode. The undersized CPTs in the breakers for the EDG rooms exhaust fans created a potential concern that under conditions of a specific level of degraded voltage on the busses (voltage lower than normal but above the undervoltage relaying actuation setpoint) in conjunction with a SIAS, fuses located in the breakers control power circuits could fail, thereby, disabling the fans. With the EDGs operating in a running standby mode under these conditions without room cooling, the units could eventually become disabled due to overheating. Because this condition affected both redundant EDGs and due to the length of time the condition has existed, the design deficiency was considered to be significant.

F. Basis For Reportability

This event was considered to be reportable pursuant to 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(i). The NRC Operations Center was notified in accordance with 10CFR50.72(b)(1)(ii)(B) at 0825 hours on January 19, 1991.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Arkansas Nuclear One, Unit Two	05000368	91	002	00	0404

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

G. Additional information

There have been no previously reported similar events at ANO.

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].