



**Entergy
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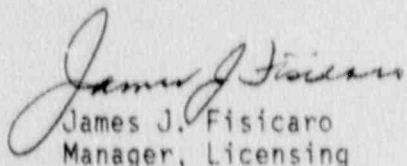
U. S. Nuclear Regulatory Commission
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SUBJECT: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Licensee Event Report 50-368/90-016-01

Gentlemen:

In accordance with 10CFR50.73(a)(2)(iv), attached is the subject report regarding a personnel error and unacceptable work practice which resulted in starting of the Emergency Diesel Generators during the performance of a special work plan. The report is being supplemented to provide a revised schedule for completion of corrective actions.

Very truly yours,


James J. Fisicaro
Manager, Licensing

JJF//LAT/sgw
Attachment

cc: Regional Administrator
Region IV
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Arkansas Nuclear One, Unit Two DOCKET NUMBER (2) 050003681
PAGE (3) 1 OF 5

TITLE (4) Personnel Error and Unacceptable Work Practice Resulted in Starting of the Emergency Diesel Generators During the Performance of a Special Work Plan

EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
Month	Day	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)
07	16	90	016	01	01	16	90		050003681

OPERATING MODE (9) 5 THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

POWER LEVEL (10) 000	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)	X 50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(x)	73.71(b)	73.71(c)	Other (Specify in Abstract below and in Text, NRC Form 366A)
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LICENSEE CONTACT FOR THIS LER (12)

Name: Larry A. Taylor, Nuclear Safety and Licensing Specialist
 Telephone Number: 501964-5000
 Area Code: 501964

COMPLETE 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)

Yes (If yes, complete Expected Submission Date) No

EXPECTED SUBMISSION DATE (15)	Month	Day	Year

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

While in Cold Shutdown, a test of the 4160 Volt (V) (2A3 and 2A4) Engineered Safety Features undervoltage (UV) relays was performed. The test was intended to demonstrate continuity of the UV system circuitry without starting the Emergency Diesel Generators (EDGs) and ensure the circuitry is disabled with the EDG simulated in service. Auxiliary relays, providing various functions including a start signal to the EDG, are disabled by lifting leads from multiple stack relays. On July 15, 1990, while performing the 2A4 UV system test, the incorrect leads were lifted. When the offsite power feeder breaker was opened as directed by procedural steps, an actual UV condition occurred. The EDG started and tied-on to its associated 4160 V bus. The cause of this event was personnel error. The technicians incorrectly counted the stacks on the relays. The personnel involved have received counselling. While performing the 2A3 UV test and reconnecting the lifted leads, contact was inadvertently made with another connection resulting in an inadvertent EDG start. This was caused by an unacceptable work practice where, previously, potential "at risk" work activities have been accepted as the necessary method of performing work activities by craft personnel and accepted by management. A series of meetings were conducted addressing this problem.

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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 these events Arkansas Nuclear One, Unit Two (ANO-2) was in Mode 5 (Cold Shutdown). Reactor Coolant System (RCS) [AB] temperature was approximately 125 degrees Fahrenheit and RCS pressure at atmospheric. A maintenance outage was in progress to repair leaking pressurizer code safety valves.

B. Event Description

Technical Specification table 4.3-2, item 7.b requires that a channel functional test of the 4160 Volt (V) (2A3 and 2A4) Engineered Safety Features (ESF) [JE] undervoltage (UV) relays be performed once every eighteen months. On July 16, 1990, while performing a special work plan (OP 2409.258) to functionally test 2A3 and 2A4 UV relays, an unplanned automatic start of the Emergency Diesel Generators (EDG) [EK] occurred.

In March 1990 an evaluation of the channel functional test for the 4160 V ESF system was performed and determined to satisfy Technical Specifications, however, we felt that enhancements could be made. The special work plan was written to provide detailed testing of the 4160 V ESF UV system. The purpose of the work plan is to demonstrate continuity of the UV system circuitry for the 4160 V ESF electrical buses without starting the EDGs and ensure the circuitry is disabled as designed with the EDG simulated in service. The 4160 V ESF bus UV systems are tested independently when the plant is in Cold Shutdown. The systems powered by the 4160 V ESF bus are aligned to enable deenergizing of the loads. Auxiliary relays in the protection system circuits which provide various functions including a start signal to the EDGs are disabled by lifting leads from multiple stack relays. Lifting these leads prevents actual starting of the EDG and load shedding of the bus. (A multiple stack relay is a relay which has various wafer-like terminal blocks. Each terminal block has several contacts. The terminal blocks are stacked with a small amount of space between each layer to allow for connecting electrical leads. By design, the lifting or retermination of leads is cumbersome and the potential exists for an incorrect lead to be lifted or inadvertent contact to be made with another connection.) The feeder breaker from the offsite power source is then opened and continuity of the circuitry is verified. A patch cord (test device) is installed in the electrical output breaker for the EDG and the breaker closed, simulating a start of the EDG. The circuitry is then verified to not have continuity, ensuring when the EDG is supplying the ESF bus, no load shedding occurs. The leads which were lifted from the stack relays are then returned to their original contact and independently verified. Finally, the systems powered by the 4160 V ESF electrical bus are realigned, as desired.

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

A step in the work plan specified that certain leads be lifted from designated contacts and stacks on the multiple stack relays. When this step was performed, electrical maintenance personnel lifted the incorrect leads from the multiple stack relays. As directed in steps of the work plan, the offsite power feeder breaker was opened. This enabled the auxiliary relays to actuate which resulted in the start of #2 EDG. An UV condition was created when the offsite power supply breaker was opened, and after a few seconds the EDG tied-on to 2A4 supplying emergency power. The UV system functioned as designed.

During the performance of the test on the 2A3 UV relays, an unexpected automatic start of #1 EDG occurred. Following satisfactory completion of the test, when the leads were being reconnected to the multiple stack relays as directed by a step in the work plan, contact was inadvertently made with another connection which resulted in the start of #1 EDG. An UV condition was not present, and therefore, the EDG did not tie-on to supply emergency power to 2A3.

C. Root Cause

The cause of the start of #2 EDG was personnel error. A step in the special work plan directed the technicians to lift leads from the #1 stack at contacts A and B. The lifting of these leads would prevent the actuation of the auxiliary relays. The electrical technicians performing the special work plan did not correctly identify the #1 stack and instead lifted leads from the #2 stack. When the offsite feeder breaker was opened an UV condition was created and the #2 EDG started and tried to its associated electrical bus (2A4) as designed. As a contributing cause an impact statement on the job order directing the performance of the special work plan was not clearly written. The impact statement stated that the EDG would be out of service to the extent that it could not be used to power the electrical bus being tested. The electrical technicians interpreted the words to mean the EDG would not start (i.e., EDG start handswitch was in pull-to-lock, blocking a start). Additionally, the job order package did not include a drawing of the relay to assist the technician in identifying the correct relay stack.

The cause of the start of #1 EDG was attributed to an unacceptable work practice which has existed at ANO. In the development of the special work plan it was clear that the potential existed for the start of the EDG due to the design of the relays. At this point, the potential for the ESF actuation should have been elevated to a higher level of management for evaluation. Additionally, when the work was being performed with the approved plant procedure, the electrical technicians were aware there was a potential "at risk" condition, but did not elevate their concern to their supervision. The unacceptable practice at ANO has been to perform the work by taking what may be an unnecessary risk in performing work activities without supervisory consultation.

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

D. Corrective Actions

The personnel involved in the performance of the special work plan have received counselling. Instructions have been provided to electrical technicians and instrumentation and controls technicians on the design of multiple stack relays. Additionally, the planners desk guide will be revised to require planners to include a drawing of a multiple stack relay in the work package when multiple stack relays are affected in the work scope of the job. The revision to the desk guide will be completed by September 30, 1990. This will help prevent confusion in the future when work is being performed on multiple stack relays. Training on multiple stack relays will be included in the requalification training program for electrical and instrumentation and controls personnel. The training program will be in place and training will have been provided on multiple stack relays for Unit 2 personnel by December 31, 1990. Due to an ANO-1 refueling outage currently in progress, training for Unit 1 personnel will be completed by February 28, 1991. Additionally planning personnel will receive training to improve impact statements to more accurately reflect the effect on the system and actual system condition (i.e., system is out of service). This training will be completed by September 30, 1990.

The management expectations of the need to elevate potential "at risk" work activities or proposed work activities to a higher level for management evaluation have been clearly communicated to the craft personnel through a series of meetings with the personnel and their supervision. Additionally, to ensure that unnecessary "at risk" work activities are avoided, electrical, instrumentation and controls personnel and their supervision will receive training on ESF terminology and the result of inadvertent ESF actuations. This training will be completed by February 28, 1991. Where an "at risk" work activity cannot be performed by another method, prior to performance, the work activity should be elevated to the appropriate level of management for their involvement.

This special work plan was written to be performed only once. In the future, the 4160 V ESF UV circuitry will be tested utilizing the previously existing test procedure with some enhancements. The testing method will not require that leads be lifted or reterminated from multiple stack relays.

These events are not believed to be a generic concern. Normally work performed on multiple stack relays to change out the relays is performed via an approved special work plan with explicit instructions already included in the work plan. Additionally, this incident has been discussed with crafts personnel and will be included in future retraining classes.

An evaluation is being performed to determine when it may be appropriate to secure the EDG during maintenance activities and the method by which it should be accomplished. This evaluation will be completed by November 1, 1990.

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E. Safety Significance

The purpose of this test was to ensure continuity of the UV circuitry and thereby, verify that the EDG would receive a start signal from an UV condition (i.e., loss of offsite power). The test was satisfactorily completed verifying the continuity and operability of the UV circuitry. Neither EDG was rendered inoperable as a result of the start. Each inadvertent start resulted in each EDG functioning as designed. Therefore, there were no safety concerns related to these events.

F. Basis for Reportability

These events are reportable pursuant to 10CFR50.73(a)(2)(iv), as an automatic ESF actuation.

G. Additional Information

A similar event which resulted in EDG starts caused by personnel error was reported in 50-313/89-040-00.

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