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Subject: Arkansas Nuclear One - Units 1 and 2
Docket Nos. 50-313 & 50-368
License Nos. DPR-51 & NPF-6
Response to Inspection Report
50-313/92-16; 50-368/92-16

Gentlemen:

Pursuant to the provisions of 10CFR2.201, Attachment A contains the response to the violation identified during the Arkansas Nuclear One (ANO), Unit 1, Electrical Distribution System Functional Inspection. Additionally, Attachment B contains an integrated schedule for the six (6) identified Inspector Follow-up Items. Integrated completion dates for the Inspector Follow-up items discussed in Attachment B were derived considering resources, priorities and schedules commensurate with other safety-related work activities (e.g., outage preparation, operational support and ANO Unit 2 EDSFI follow-up items).

We appreciate NRC's recognition of our strengths in the Electrical Distribution System (EDS) area. Our efforts will continue to focus on improving overall performance to achieve operational and engineering excellence.

Should you have questions or comments, please call me at 501-964-8601.

Very truly yours,

James J. Fisicaro
James J. Fisicaro
Director, Licensing

JJF/RMC/mmg
attachments

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U. S. NRC
August 3, 1992
Page 2

cc: Mr. James L. Milhoan
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-8064

NRC Senior Resident Inspector
Arkansas Nuclear One - ANO-1 & 2
Number 1, Nuclear Plant Road
Russellville, AR 72801

Mr. Thomas W. Alexion
NRR Project Manager, Region IV/ANO-1
U. S. Nuclear Regulatory Commission
NRR Mail Stop 13-H-3
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

Ms. Sandra R. Peterson
NRR Project Manager, Region IV/ANO-2
U. S. Nuclear Regulatory Commission
NRR Mail Stop 13-H-3
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

ATTACHMENT A

NOTICE OF VIOLATION

During an NRC inspection conducted from May 18 through June 5, 1992 a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violation is listed below:

Arkansas Nuclear One, Unit 1 Technical Specification 6.8.1 states, in part, that written procedures shall be established, implemented and maintained covering surveillance and test activities of safety-related equipment.

Administrative Procedure 1000.139, "Periodic Review of Procedures," Revision 0 dated September 16, 1991, was established to ensure that procedures were properly maintained. This procedure contained the following provisions:

Step 6.3.1 of Procedure 1000.139 required that if the reviewer determined that a procedure should be corrected but is adequate for use as is, the procedure shall be corrected within ninety (90) days following the periodic review, or the procedure shall be declared inactive and a revision correcting the deficiencies shall be completed prior to its next use.

Step 6.3.2 of Procedure 1000.139 required that if the reviewer determined that the procedure was not adequate for use, the reviewer notify the responsible department head so that a revision or Permanent Change may be immediately written to correct the identified problems, or the reviewer completes Form 1000.139B so that the procedure may be declared inactive and a revision correcting the deficiencies shall be completed prior to its next use.

Contrary to the above, certain relay test procedures were not properly maintained as evidenced by the following:

Relay Procedure 1307.030, "Testing of Undervoltage Blocking Relays - Unit # 1," Revision 1, had been reviewed in July 1990 and the reviewer had determined that the procedure needed to be revised but was adequate for use as it was written. However, as of the time of the inspection, this procedure had not been revised or declared inactive as required.

Relay Procedure 1412.018, "Protective Relay Test & Inspection in Circuit Breakers W/GE Models 12IAC51A & 12NGV13A Relays," Revision 3, had been reviewed in October 1991 and the reviewer had determined that the procedure was not adequate for use as it was written. The reviewer had determined that the procedure did not have adequate direction to perform the task and was technically inadequate. As of the time of the inspection, this procedure had not been declared inactive and had been implemented subsequent to the licensee's review without being revised as required.

This is a Severity Level IV violation (313/9216-07) (Supplement 1)

Response to Violation 313/2216-01

(1) Reason for the violation:

The Notice of Violation identifies two procedures that were in non-compliance with ANO Biennial Review Requirements. ANO agrees that a violation concerning the failure to properly maintain procedure 1412.018, "Protective Relay Test & Inspection in Circuit Breakers W/GE Models 12IAC51A & 12NGV13A Relays" occurred. However, Procedure 1307.030, "Testing of Undervoltage Blocking Relays - Unit # 1," Revision 1, (performed during refueling outages) had its biennial review performed in 1990 which was before procedures were required to be rendered inactive if changes were necessary. The reviewer stated that the procedure needed to be revised but was adequate for use as is. The requirement to render procedures inactive was not effective until September 16, 1991, and since 1307.030 was reviewed before this date, it was not required to be rendered inactive. Procedure 1307.030 will be revised as necessary by December 31, 1992.

The violation for not rendering procedure 1412.018 inactive, was caused by the failure to properly implement Station Administrative Procedure 1000.139, "Periodic Review of Procedures", Revision 0, which requires procedures to be placed inactive if necessary. This procedure was developed to address previous self identified discrepancies in the procedure review process.

(2) Corrective steps taken and results achieved:

On May 22, 1992, Procedure 1412.018, "Protective Relay Test & Inspection in Circuit Breakers W/GE Models 12IAC51A & 12NGV13A Relays", was placed in an inactive status. Procedure 1412.018 is normally performed during refueling outages and will be revised prior to use during the ANO Unit 2 refueling outage scheduled to begin in September 1992.

An investigation of other biennial reviews for procedures assigned to Central Maintenance - Relay, revealed that 38 procedures reviewed had not been revised as required by Procedure 1000.139. These procedures were Preventive Maintenance tasks and the changes identified were for upgrading procedure formats or the failure to perform a timely procedure review. By June 1, 1992, these procedures were placed in an inactive status until their formats can be changed or a procedure review can be performed. There were no safety significant issues associated with these procedures identified during this review.

(3) Corrective steps that will be taken to prevent recurrence:

Section Leaders who received Biennial Review Notices after September 16, 1991, will be requested by August 14, 1992, to verify that procedures found technically inadequate have been dispositioned in accordance with procedure 1000.139.

In a letter from the NRC dated June 4, 1992, the NRC approved the deletion of the biennial procedure review process requirement for ANO. Since the cause of the violation involves the failure to perform follow-up actions to ensure procedure revision or cancellation, the removal of biennial reviews of these and other similar procedures should not lessen the ANO procedure revision program. However, improved guidance on the follow-up of procedure revisions is necessary. The ANO procedure review program is currently being evaluated to determine what additional controls are necessary to address this procedure revision error. This includes an effectiveness review of Procedure 1000.139. The revised procedure review process is expected to be completed by September 30, 1992.

Additionally, department level training on the revised review requirements will be completed by November 30, 1992.

(4) Date of full compliance:

Full compliance was achieved by June 1, 1992, when the additional 38 Central Maintenance - Relay procedures were placed inactive. Additional enhancements to the procedure review program addressed in paragraph three (3) above will be completed by November 30, 1992.

ATTACHMENT B
INSPECTOR FOLLOW-UP ITEMS
INTEGRATED CORRECTIVE ACTION SCHEDULE

1. FINDING ACTION

The adequacy of the startup transformer's surge protection devices will be reverified. (IFI 313/9216-01)

ANO RESPONSE

An analysis to evaluate the surge arrester characteristics and insulation voltage withstand ratings of ANO Unit 1 installed equipment will be performed to identify existing protective margins. The equipment to be analyzed includes associated transformers, circuit breakers, connecting cables and switchgear from the startup transformers through the 4.16kv and 480 vac engineered safeguard busses.

This analysis with recommendations for corrective action, if required, will be completed by April 30, 1993.

2. FINDING ACTION

The adequacy of the protective devices for the containment electrical penetration devices will be reanalyzed.
(IFI 313/9216-02)

ANO RESPONSE

An evaluation of the ANO Unit 1 reactor building containment penetrations will be performed. Credit will be taken for one (1) level of fault protection which coordinates with the capability curve of the penetration conductor at maximum postulated fault levels. The rated short circuit thermal capability curves (I^2t) for the penetration conductors will be based on the values provided in IEEE 317-1971.

The evaluation methodology includes:

- a. The development of a list of containment penetration schemes.
- b. Documentation of reactor building containment penetration protective device settings.
- c. Development of conductor damage curves for each containment penetration circuit that provides the maximum possible fault current vs. time condition the conductor can withstand. Additionally, the applicable protective device trip curve will be superimposed on the conductor damage curve to demonstrate coordination.
- d. Demonstration of each circuits maximum available short circuit current to verify the acceptability of the reactor building containment penetration protection.

- c. The development of a list of instrumentation circuitry penetrating the ANO Unit 1 reactor building containment. This list will include the circuit power supply, isolation method, and/or current limiting means.

The above evaluation with recommendations for corrective action, if required, will be completed by December 31, 1993.

3. FINDING ACTION

The EDG loading, including the automatic sequencing of accident loads will be reevaluated. (IFI 313/9216-03a,b,c)

/NO RESPONSE

IFI 313/9216-03a

During the NRC EDSFI, ANO agreed to revise calculations 86-E-0002-01, "ANO-1 Diesel Generator #1 and #2 Load Study," and 90-E-0062-02, "Unit 1 Emergency Diesel Generator Loads," to correct the assumptions related to service water pump power requirements and decay heat removal system operation.

The service water pump power requirements and the decay heat/emergency feedwater assumptions noted in the EDSFI inspection report do not significantly reduce the margins of EDG capacity limits. Since this is true, immediate revisions to the above calculations are not warranted; however, these calculations will be revised to correct the assumptions prior to the ANO Unit 1 refueling outage 1R11, which is currently scheduled for the latter part of 1993.

IFI 313/9216-03b

The NRC EDSFI report stated, "The licensee's evaluation of the EDG loading conditions will include: (a) the potential overlap of reactor building spray pumps and reactor building cooling fans; (b) the potential for two high pressure injection pumps starting simultaneously; (c) and the allowable time an emergency diesel generator can operate without service water cooling".

- a. The possibility of an overlap (simultaneous starting) of the ANO Unit 1 reactor building spray pumps and the reactor building cooler fans was identified. This is of concern for the red-train diesel only, since the loading of this diesel includes an additional 700 HP emergency feedwater pump. An analysis has determined that the events which could cause this overlap to occur are highly improbable. Therefore, this is not a safety significant issue for ANO Unit 1. Recognizing the low safety significance of this issue, the emergency diesel generator (EDG) loading sequence will be analyzed to determine if the EDG is capable of simultaneously starting the reactor building spray pumps and reactor building cooler fans. Results of this analysis will be evaluated in a manner consistent with Nuclear Management and Resources Council document 91-C4, "Severe Accident Issue Closure Guidelines." This approach follows the guidelines established in GL 88-20, Section 8, "Individual Plant Examination For Severe Accident Vulnerabilities".

This analysis with recommendations for corrective actions, if required, will be completed by March 1, 1993.

- b. The primary and swing high pressure safety injection pump breakers are electrically interlocked to prevent one breaker from closing if the other breaker is closed. The setpoints of the EDG load sequence relays for these pumps are also offset to prevent the breakers from closing simultaneously. The load sequence relays are Agastat pneumatic timers which have a repeatability of $\pm 10\%$. The primary pump relay is set at five (5) seconds and the swing pump relay is set at seven (7) seconds. Even though these relays are tested during refueling outages the concern is that the setpoints do not allow for drift. It should be noted that, due to the circuit interlock, this possibility of simultaneous starting is remote since both pump timers must actuate within the closing time for one breaker (approximately 5 to 8 cycles).

Since the concern is Agastat relay setpoint drift, an evaluation of the setpoints of the EDG load sequencing relays and consideration of replacement with solid state relays which have a $\pm 2\%$ repeatability will be performed. This evaluation with recommendations for corrective action, if required, is scheduled to be completed by March 1, 1993.

- c. The allowable time the EDG's can operate without service water has been determined. For cold start, the allowable time is approximately three (3) minutes. For hot start, the allowable time is approximately one (1) minute. These values were provided by the EDG vendor, MKW Power Systems.

IFI 9216-03c

The EDSFI report stated that the licensee agreed to reevaluate the EDG testing methods and their review of test data as part of the overall EDG loading study.

ANO currently has a digital data acquisition system (DAS) which is capable of monitoring up to 16 analog channels with adequate resolution for the various parameters associated with the Integrated Engineered Safeguards (E^s) test. This equipment and other options, such as connecting the monitored parameters to the plant computer, will be evaluated, and a method selected, prior to the ANO Unit 1 refueling outage 1R11. Current plans are to utilize the DAS in parallel with the previously used test equipment to allow greater resolution and comparison of the new equipment versus the old test equipment. This comparison will allow a determination of the optimum test setup and an evaluation of selected past outage data against the data collected in 1R11.

Additionally, the ANO Unit 1 System Engineering department will review the emergency diesel generators' voltage and frequency response to the Integrated ES test. This review will identify any obvious degradation of the diesel's ability to accelerate and carry the loads which are sequenced on the generators during the Integrated ES test. The Integrated ES test procedure will be revised prior to the ANO Unit 1 refueling outage 1R11 to ensure that the ANO Unit 1 System Engineering department is provided with the appropriate test data for review and trending.

4. FINDING ACTION

A formal voltage drop analysis of the Class 1E dc powered components, including the inverter loads, will be completed. (IFI 313/9216-04)

ANO RESPONSE

The DC system voltage drop study will consist of two parts: (a) a 125 VDC voltage drop study and; (b) a Class 1E inverter fed 120 V vital AC voltage drop study.

a. The 125 VDC Voltage Drop Study

The 125 VDC voltage drop study will analyze all Class 1E 125 VDC loads fed from the DO1 and DO2 DC busses and the non-1E loads associated with the restoration of offsite power.

The 125 VDC voltage drop study will determine for all plant design basis events if specific calculations for each load and event will be required to ensure adequate DC component voltage, or if bounding calculations will be adequate. The calculation will also determine if exact voltage drop calculations for each battery duty cycle time interval need to be calculated, or if bounding calculations will be adequate.

During ANO Unit 1 refueling outage 1R10, a temporary modification was made to add two (2) additional cells to both ANO Unit 1 Class 1E battery banks to increase the battery banks from 58 to 60 cells, which increased the capacity of the battery banks. Preliminary calculations verifying the acceptability of this temporary modification were provided to the NRC EDSFI team. A new non-class 1E battery bank will be installed during ANO Unit 1 refueling outage 1R11 thus allowing the relocation of several large non-1E loads from the Class 1E batteries to the non-1E battery. Additionally, the Class 1E batteries will be returned to 58 cells.

The 125 VDC Voltage Drop Study will be based on the final Class 1E battery configuration described above and will be completed by July 31, 1994.

Finally, EDSFI Report 92-16 stated that ANO would revise calculation 92-E-0003-02, "Voltage Drop to B5 and B6 Circuit Breaker Closing Coils", to include the preliminary calculation performed by ANO which demonstrates that the circuit breaker spring charging motors would have sufficient terminal voltage under worst-case conditions. As stated during the inspection, we planned to include this calculation within the 125 VDC voltage drop study, instead of revising calculation 92-E-0003-02. This and other existing 125 VDC voltage drop calculations will be superceded by the new study.

b. The 120 V Vital AC Voltage Drop Study

The 120 V Vital voltage drop study will document that adequate voltage levels are delivered by the four Class 1E inverters to the vital 120 VAC Class 1E loads.

Bounding calculations will be prepared by initially assuming conservative current levels for the 120 volt power circuits to the various panels. Any panel circuit which does not meet the panel's component minimum voltage rating will have an additional calculation made using more accurate panel load data.

Any external 120 VAC equipment fed from the panels will have their exact load and minimum voltage rating documented. A voltage drop will be calculated for these external loads using their actual loads, feeder cable sizes, and voltage rating.

The 120 V Vital AC Voltage Drop Study will be completed by November 30, 1993.

5. FINDING ACTION

The EDG fuel-oil systems will be evaluated and indicated improvements will be implemented. (IFI 9216-05)

ANO RESPONSE

The ANO Unit 1 EDG fuel oil systems will be evaluated to determine what modifications are required. The modifications to be evaluated include, but are not limited to:

- a. Addition of differential pressure indication to the fuel-oil suction strainers, with additional consideration given to other alternatives.
- b. Missile protection for the EDG fuel oil day tank vents.
- c. Addition of high and low level limit switches on the EDG fuel oil day tanks. This will provide separate switches for high and low level alarms on the EDG day tanks and EDG day tank low and high level signals for fuel oil transfer pump start and stop signals.

The EDG fuel oil system evaluations with recommendations for implementation will be completed by February 15, 1993.

6. FINDING ACTION

The tornado missile protection for the EDG combustion air exhaust pipes will be verified.

ANO RESPONSE

An evaluation of the EDG combustion air exhaust pipes and "rain hood" to determine if they can sustain impacts from tornado missiles will be performed.

This evaluation with recommendations for corrective action is scheduled to be completed by November 30, 1992.