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U. S. Nuclear Regulatory Commission  
Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

Gentlemen:

Pursuant to the provisions of 10CFR2.201, attached is our response to the Severity Level III problem identified during the inspection of activities concerning the failure to recognize that Arkansas Nuclear One (ANO) Unit 1, exceeded a Technical Specification required Limiting Condition for Operation for approximately 59 hours. Additional information concerning the violation is contained in Licensee Event Report 50-313/94-001 transmitted via letter ICAN029403 dated February 25, 1994.

Should you have comments or questions please call Mr. Dwight Mims at 501-964-8601.

Very truly yours,

Attachments

To the best of my knowledge and belief, the statements contained in this submittal are true.

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for Pope County and the State of Arkansas, this 2nd day of May 1994.

Notary Public

My Commission Expires 4-24-2002

M. JANE DAVIDSON  
Notary Public  
POPE COUNTY, ARKANSAS  
Commission Expires 4-24-2002

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## NOTICE OF VIOLATION

During an NRC inspection conducted February 2-9, 1994, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10CFR Part 2, Appendix C, the violations are listed below:

- A. Technical Specification 3.4.1 states, in part, that the reactor shall not be heated above 280 degrees F unless both EFW pumps and their flow paths are operable. Technical Specification 3.4.5.1 states, in part, that with one EFW flow path inoperable, the unit shall be brought to hot shutdown within 36 hours.

Contrary to the above, at approximately 12 a.m. on January 28, 1994, one EFW flow path became inoperable due to a malfunctioning steam generator level transmitter (which would have affected automatic flow control in one flow path) and the unit was not brought to hot shutdown within 36 hours. The unit was brought to hot shutdown at approximately 1:55 p.m. on February 1, 1994, approximately 74 hours after one EFW flow path became inoperable. (01013)

- B. Technical Specification 6.8.1 a requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, November 1972.

Regulatory Guide 1.33, Appendix A, Revision 2, November 1972, lists typical safety-related activities that should be covered by written procedures, including: (1) administrative procedures governing the authorities and responsibilities for safe operation and shutdown, and (2) administrative procedures governing log entries and record retention.

ANO Procedure 1015.003A, Revision 31, "Unit One Operation Logs," Section 6.5.4 requires, in part, that operators perform the following actions when an Operability Difference ("Op. Diff.") value is exceeded: declare the affected instrument channel or indicator inoperable; initiate a condition report; and implement any actions required by Technical Specification Limiting Conditions for Operation.

Procedure 1015.003A, Section 4.4, defines operability difference values as variations between Technical Specification or other NRC required instrumentation channels monitoring the same parameter which, if exceeded, will constitute instrument component inoperability.

Procedure 1015.003A, Form 1: 15.003A-7, "CBO Reactor Logsheet," specifies an operability difference of 8 inches for instrumentation channels monitoring Steam Generator Low Range Level and, in Footnote 2, requires that if the operability difference limits are exceeded, the SS/CRS (shift superintendent/control room supervisor) be immediately notified, a condition report be written, and the affected instrument be declared inoperable.

Section 6.5.2 of ANO Procedure 1015.001, Revision 46, "Conduct of Operation," requires, in part, that the Control Board Operator (Reactor) monitor parameters associated with plant operations, recording those which are specified on log sheets, and notify the SS or CRS of unusual indications or abnormal trends.

Contrary to the above, from January 2, 1994, until January 31, 1994, the indication from Steam Generator Low Range Level Transmitter LT-2622 varied from the other NRC required instrument channel indications monitoring the same parameter by more than 8 inches, a value in excess of the specified operability difference, and licensed operators did not: (1) immediately notify the SS/CRS that the operability limit was exceeded; (2) declare Low Level Transmitter LT-2622 inoperable; (3) initiate a condition report; and (4) implement actions required by the Technical Specifications Limiting Conditions for Operation for an inoperable EFW flow path (01023)

These violations represent a Severity Level III problem (Supplement I)

Response to violation 313/9412-01, 368/9412-01

(1) Reason for the violation:

On January 22, 1994, Once Through Steam Generator (OTSG) Level Indicator LI-2622, the indicator for level transmitter LT-2622, was noted to be greater than the allowable maximum normal difference between channels during the channel check performed every eight hours as part of the reactor operator (RO) log. To perform the channel check in question, three OTSG level indicators are compared by the RO, the maximum difference between channels is mentally calculated, and a comparison is made to the values for maximum normal difference and operability difference. These readings are reviewed once per shift by the Control Room Supervisor (CRS), and daily by the Operations Shift Superintendent (SS). The RO is procedurally required to initiate a job request if the difference exceeds the maximum normal difference of five inches. If the difference between the channels exceeds the operability difference of eight inches, the RO is required to notify the SS/CRS immediately and write a Condition Report.

In this instance the RO logged the reading as being greater than five inches on January 22, 1994, circled the reading on the log sheet, and initiated a job request to repair the indicator as required by procedure. The job request number was annotated on the back of the log sheet as corrective action for the out of specification reading and subsequent readings were circled referencing the same note. During the midnight shift (2300-0700) on January 28, 1994, LI-2622 exceeded the operability difference of eight inches; however, this was not recognized by the Control Room Operators.

LI-2622 was identified as being outside of its operability limits at 2150 on January 31, 1994, by the evening shift (1500-2300) RO while walking down the control panel. The RO notified the Shift Superintendent as required and a Condition Report was initiated. The unit entered the Technical Specification action which requires placing the plant in hot shutdown within 36 hours based on the inoperability of one EFW flow path associated with the level control feature of LT-2622.

A Notification of Unusual Event (NUE) was declared when shutdown commenced at 0905 on February 1, 1994, based on the initiation of a shutdown required by Technical Specifications. Transmitter LT-2622 was replaced while the plant was in hot shutdown and was declared operable along with its associated EFW flow path at 2204 on February 1, 1994. The NUE was terminated at this time. The Unit was returned to power on February 2, 1994.

The root cause of the failure to identify LT-2622 being inoperable was determined to be inattention to detail on the part of ANO Unit 1 licensed operators while taking logs. The operators did not exhibit a questioning attitude as the difference continued to grow and exceed the operating limit. Several factors were identified which contributed to this event. The RO log which contains the channel check requires a mental calculation to determine the channel difference that is then compared to a specified value. This difference was not procedurally required to be written on the log. This task is performed many times for a single set of logs and requires attention to detail to avoid error. Additionally, procedural requirements were vague as to the requirements for CRS/SS review of these logs, and Operations management did not provide sufficient feedback to operators on the seriousness of log taking errors. Further, a false sense of problem resolution was created as a result of the continued reference on the log sheet to the job request that had been initiated to correct the level indication discrepancy. This condition obscured the need to take further action when the difference increased beyond the operability limit.

(2) Corrective steps taken and results achieved:

- Transmitter LT-2622 was replaced while the plant was in hot shutdown and was declared operable along with its associated EFW flow path at 2204 on February 1, 1994.
- A dedicated operator was immediately stationed in the Unit 1 Control Room to manually control level in the "A" OTSG if required during the out-of specification and plant shutdown period.
- A review of the January 1994 Control Room logs was completed on February 5, 1994, to identify any other errors associated with channel check comparisons. No significant deficiencies were noted.
- The Operations Manager for Unit 1 conducted a CRS/SS meeting on February 5, 1994, to review this event emphasizing Technical Specification requirements, Licensed Operator responsibilities, and management expectations. The ANO Vice President of Operations also attended the Unit 1 CRS/SS meeting to reinforce management expectations.
- Unit 1 Shift Superintendents conducted crew meetings attended by either the Operations Manager or Assistant Operations Manager between February 4-8, 1994, to review this event with their respective operating crews emphasizing Technical Specification requirements, licensed operator responsibilities and management expectations.

- Unit 1 Shift Superintendents completed additional crew meetings between February 19 and March 3, 1994. During these meetings emphasis was placed on management expectations on log taking, how this event could have been prevented by use of self checking techniques, review of log taking errors from previous log reviews and lessons learned from this event.
- A Human Performance Enhancement System (HPES) evaluation was performed regarding this event on February 10, 1994, and several human factor enhancements were identified for implementation.
- Involved operators responded to a questionnaire which provided their perspective of the event, acceptance of responsibility and accountability for their actions and provided recommendations for enhancing operator log taking practices.
- Unit 2 operations management reviewed this event with their Shift Superintendents on February 10, 1994, to address the generic human performance implications.
- Human factor enhancements were added on February 16, 1994, to the Unit 1 operator logs, which had previously required mental calculations/comparisons, so that difference values could be visually compared to a standard. Additionally, Technical Specification log readings were segregated on a separate log form. Until human factors enhancements could be incorporated a Senior Reactor Operator performed an additional daily review of logs containing Technical Specification requirements.
- Procedure 1015.003A, *Unit 1 Operations Logs*, was revised on February 16, 1994, to clarify the requirements for CRS/SS end of shift log reviews.
- The lessons learned from this event regarding performance of routine, repetitive tasks were discussed with Units 1 and 2 Maintenance, Chemistry, Radiation Protection, and System Engineering personnel between February 14, and March 17, 1994.
- An Improving Human Performance Operations task force has been formed with the support of Entergy executive management. This task force is comprised of Operations Department personnel from each Entergy nuclear site. The mission of the task force is to define the characteristics of a culture that achieves and maintains high standards of human performance and to recommend effective implementation methods for the Entergy Operations plants. The first meeting of the task force was held on April 5-6, 1994. The agenda which consisted of presentations and discussions of human performance issues included a presentation on Improving Human Performance by Dr. Chong Chiu, President of FPI International. The task force will continue to meet periodically to resolve human performance issues.

- The following operations related job request priority system enhancements for Unit 1 were completed on May 1, 1994:
  - Log deficiencies are tracked in the same manner as control room deficiencies.
  - The Planning and Scheduling *Operations Liaison Desk Guide* was revised to require periodic audits of operations log notes, operations control room status boards and disabled control room annunciators to help ensure items requiring maintenance action are properly prioritized.

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

- Computerized log taking is being evaluated for adaptation to both Unit 1 and Unit 2 Control Room logs. This evaluation is scheduled for completion by June 1, 1994.
- As a step toward future enhancements in human performance, Unit 1 Operations will evaluate feedback mechanisms used in addressing log taking errors by June 1, 1994.
- Unit 1 Log taking errors are currently being addressed with a log discrepancy form that is generated, if needed, by the SS as a result of the final review of the daily logs. An evaluation is currently being performed, and will be completed by June 1, 1994, to determine if enhancements to the method of annotating out-of-specification conditions on operator logs are required.
- An evaluation is currently being performed, and will be completed by June 1, 1994, to determine if enhancements to the methods of addressing Unit 2 log taking errors and annotating out-of-specification conditions on operator logs are required.

(4) Date when full compliance will be achieved:

Full compliance was achieved when the out-of specification condition was corrected.