

March 26, 2002

Mr. Craig G. Anderson  
Vice President, Operations ANO  
Entergy Operations, Inc.  
1448 S. R. 333  
Russellville, AR 72801

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 2 - ISSUANCE OF AMENDMENT RE:  
REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURE SENSOR  
RESPONSE TIME TESTING (TAC NO. MB3134)

Dear Mr. Anderson:

The Commission has issued the enclosed Amendment No. 239 to Facility Operating License No. NPF-6 for Arkansas Nuclear One, Unit No. 2 (ANO-2). This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated October 2, 2001, as supplemented by letter dated January 31, 2002.

The amendment changes the TS definition of reactor trip system response time and engineered safety feature response time to allow use of either an allocated or a measured response time for select sensors in these two systems.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

***/RA by R. A. Gramm for/***

Michael K. Webb, Project Manager, Section 1  
Project Directorate IV  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosures:

1. Amendment No. 239 to NPF-6
2. Safety Evaluation

cc w/encls: See next page

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ENERGY OPERATIONS, INC.

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 239  
License No. NPF-6

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee), dated October 2, 2001, as supplemented by letter dated January 31, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-6 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 239, are hereby incorporated in the license. Entergy Operations, Inc., shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Robert A. Gramm, Chief, Section 1  
Project Directorate IV  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical  
Specifications

Date of Issuance: March 26, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 239

FACILITY OPERATING LICENSE NO. NPF-6

DOCKET NO. 50-368

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

II  
1-5  
1-6  
B 3/4 3-1a

Insert

II  
1-5  
1-6  
B 3/4 3-1a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 239 TO

FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO. 2

DOCKET NO. 50-368

1.0 INTRODUCTION

By letter dated October 2, 2001, as supplemented by letter dated January 31, 2002, Entergy Operations, Inc. (the licensee), submitted a request for changes to the Arkansas Nuclear One, Unit No. 2 (ANO-2), Technical Specifications (TSs). The requested changes would change the TS definition of reactor trip system response time and engineered safety feature trip time to allow use of either an allocated or a measured response time for select sensors in these two systems.

The January 31, 2002, supplemental letter changed the proposed TS definitions to be consistent with previously approved wording contained in NUREG-1432, Revision 2, "Standard Technical Specifications Combustion Engineering Plants" and TS Task Force (TSTF) Traveler 368, Revision 0, which was incorporated into the Definitions and Bases sections in NUREG-1432. The January 31, 2002, supplemental letter did not change the scope of the original *Federal Register* Notice (66 FR 55016, October 31, 2001), or the initial no significant hazards consideration determination.

2.0 BACKGROUND

The proposed change will allow use of either an allocated or a measured response time for selected sensors in these two systems. In conjunction with this TS change request, the licensee committed to modify or develop new procedures to perform a hydraulic response time test prior to installation of any new pressure sensor or following maintenance activities that could adversely affect sensor response time.

3.0 DISCUSSION

The requirement for periodic testing of reactor trip systems is established in Section 50.55a, "Codes and Standards," of 10 CFR Part 50. Section 50.55a(h)(2) states that: "For nuclear power plants with construction permits issued after January 1, 1971, but before May 13, 1999, protection systems must meet the requirements stated in either IEEE Std. 279, 'Criteria for Protection Systems for Nuclear Power Generating Stations,' or IEEE Std. 603-1991, 'Criteria for Safety Systems for Nuclear Power Generating Stations,' and the correction sheet dated

January 30, 1995.” In addition, 10 CFR 50.36(c)(2)(ii)(A) requires a TS limiting condition for operation for “installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.”

Section 50.36(c)(3), “Surveillance Requirements,” also states that: “Surveillance requirements are requirements related to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within the safety limits, and that the limiting conditions for operation will be met.” In 1975, the NRC implemented a program that made response time testing (RTT) a requirement of the TS.

In June 1999, the Combustion Engineering Owners Group (CEOG) submitted a Topical Report CE-NPSD-1167, “Elimination of Pressure Sensor Response Time Testing Requirements” for NRC review. The request to eliminate RTT includes plant-specific information on five licensees with a total of 11 nuclear power plants that include Entergy’s Arkansas Nuclear One, Unit 2. In CE-NPSD-1167, the CEOG proposed eliminating the requirements for RTT of selected pressure sensors in the reactor protection system (RPS), the emergency core cooling system (ECCS), and the isolation actuation system (IAS). The ECCS and the IAS are part of the engineered safety features. In August 1999, the CEOG submitted Revision 1 to CE-NPSD-1167 to modify the pressure transmitter allocated response times from values that were based upon historical data collected at the plants to values that are based upon vendor data of expected response times of properly operating instruments. In May 2000, the CEOG submitted Revision 2 to CE-NPSD-1167 to incorporate NRC and utility comments and to correct Appendix C calculated values for allocated response times that were based upon historical data, for those sensors where no vendor response time values are available. The CE-NPSD-1167 was approved by the NRC on July 24, 2000. The NRC issued a letter dated December 5, 2000, to provide corrections on some instrument models and some response time data stated in July 24, 2000, letter.

The following are the pressure sensors for which the CEOG has requested elimination of RTT:

- Rosemount Differential Pressure or Pressure Transmitters Models 1152 DP, HP, AP and GP, range codes 3, 4, 5, 6, 7, 8, 9, and 0
- Rosemount 1153 Differential Pressure or Pressure Transmitters Models 1153 D, H, A, and G, range codes 3, 4, 5, 6, 7, 8, and 9
- Rosemount 1154 Differential Pressure or Pressure Transmitters Models DP, HP, and GP, range codes 4, 5, 6, 7, 8, 9, and 0
- Rosemount 1154H Differential Pressure or Pressure Transmitters Models D, H, and S, range codes 4, 5, 6, 7, 8, and 9
- Barton 763 and 763A Pressure Transmitter and 764 Differential Pressure Transmitter
- Foxboro Models N-E11DM, N-E13DM, and E13DM
- Weed Model N-E11GM

Most operating nuclear power plants TSs require licensees to periodically perform RTT for selected instrument channels in the RPS, the ECCS, and the IAS. The intent of these tests is

to ensure that changes in response time of instrumentation beyond the limits assumed in safety analyses are detected and, combined with instrument calibrations, to ensure that the instrumentation is operating correctly.

The basis for elimination of RTT is contained in IEEE 338, Section 6.3.4, paragraph 3 which states: "Response time testing of all safety-related equipment is not required if, in lieu of response time testing, the response time of the safety equipment is verified by functional testing, calibration checks or other tests or both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics which are detectable during routine periodic tests." This IEEE standard was endorsed by Regulatory Guide 1.118, "Periodic Testing of Electric Power and Protection Systems."

In 1991, an Electric Power Research Institute (EPRI) Report, NP-7243, "Investigation of Response Time Testing Requirements," was issued. That report included a failure mode and effects analysis of certain sensors as well as an evaluation of response time test data. The report determined that for these sensors, any failure that will affect the response time characteristic of the sensors will also affect the calibration and other routine surveillance, and therefore, a separate response time test is not required to demonstrate response time assumptions used in the Final Safety Analysis Report. In CE-NPSD-1167, the CEOG has requested elimination of RTT for sensors evaluated in EPRI Report NP-7243 and used by CE plants.

#### 4.0 EVALUATION

Current ANO-2 TSs require the licensee to perform response time testing using a series of sequential, overlapping, or total channel test measurements. The NRC approved CEOG topical report CE-NPSD-1167 that justifies the substitution of an allocated response time for selected engineered safety features (ESF) and RPS sensors. To incorporate this change, the definitions of Reactor Trip System Response Time and ESF Response Time will be revised.

The licensee proposed that the following will be added to the current definitions of response time for the reactor trip system and the ESF:

"The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC."

The TS Bases for Instrumentation (B 3/4.3) will also be modified to reflect the change in definitions and to reference the CEOG topical report by adding item (3) as follows:

"Or 3) utilizing allocated response time for selected sensors. Topical Report CE-NPSD-1167-A, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the Topical Report. Response time verification for sensor types must be demonstrated by test. The allocation of sensor response times must be verified

prior to placing a new component in operation and re-verified after maintenance that may adversely affect the sensor response time.”

In NRC staff’s safety evaluation on CE-NPSD-1167 with respect to “Plant-Specific Applications,” for ANO-2, the NRC staff concluded that: “the sensors for which Entergy has requested elimination of RTT at Arkansas Nuclear One, Unit 2, have all been analyzed in EPRI Topical Report NP-7243, and in each case, the response time values have been determined by the sensor manufacturer. The staff has reviewed these systems and the applications in which these sensors are used, and concurs that these sensors and systems are appropriate for RTT elimination.”

The specific sensors and systems for which RTT elimination was requested and the allocated response time assigned to those sensors at ANO-2 is as follows:

Function	Instrument	Make / Model	Allocated Response Time
RPS Transmitter	Containment Pressure	Rosemount Model 1153 Range Code 5	.200 second
	SG Level	Rosemount Model 1154 Range Code 4	.500 second
	Pressurizer Pressure (High)	Rosemount Model 1154 Range Code 9	.200 second
	Pressurizer Pressure (Low)	Rosemount Model 1154 Range Code 9	.200 second
	SG Pressure	Rosemount Model 1154 Range Code 9	.200 second
ESFAS Transmitter	Containment Pressure	Rosemount Model 1153 Range Code 5	.200 second
	SG Level	Rosemount Model 1154 Range Code 4	.500 second
	SG Pressure & D/P	Rosemount Model 1154 Range Code 9	.200 second
	RWT Level	Rosemount Model 1153 Range Code 5	.200 second
	Pressurizer Pressure	Rosemount Model 1154 Range Code 9	.200 second

The EPRI report contains several recommendations to ensure sensors are operating correctly and that calibration or other surveillance will provide indication that the dynamic characteristic of the instrument will be accurately reflected in a static calibration. The licensee has addressed those recommendations as follows:

1. Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch to determine an initial sensor-specific response time value. The power interrupt test is an alternate method to use on force-balance transmitters; the purpose of this test is to verify sensor response time is within the limits of the allocated value for the transmitter function.

ANO-2 Approach: The licensee committed to modify or develop new procedures to perform a hydraulic response time test prior to installation of any new pressure sensors or following maintenance activities that could adversely affect sensor response time.

2. For transmitters and switches that use capillary tubes, RTT should be performed after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

ANO-2 Approach: The Rosemount transmitters, for which use of an allocated time is proposed, do not have capillary tubes. This recommendation is not applicable.

3. Perform periodic drift monitoring on all Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153, and 1154. Guidance on drift monitoring can be found in Rosemount Technical Bulletins. Drift monitoring intervals should be based on utility response to NRC Bulletin 90-01.

ANO-2 Approach: The licensee has a Rosemount transmitter drift monitoring program established in response to NRC Bulletin 90-1, "Loss of Fill-Oil in Transmitters made by Rosemount." Drift monitoring is currently performed at ANO-2 on instrumentation that was subject to the problem identified in the bulletin. Four of the pressurizer pressure transmitters and four refueling water tank level transmitters included in this request are monitored for drift.

4. If variable damping is used, implement a method to ensure that the potentiometer is set at the required setting and cannot be inadvertently changed. This approach should eliminate the need for RTT to detect a variable damping failure mode. Otherwise, RTT each transmitter by hydraulic or electronic white noise analysis methods following each transmitter calibration.

ANO-2 Approach: None of the transmitters for which the licensee is proposing to apply an allocated time have the variable damping feature. This recommendation is not applicable.

The NRC staff finds that the proposed change is based on the CEOG Topical Report CE-NPSD-1167, which includes the review and guidance contained in EPRI NP-7243. The CE-NPSD-1167 report justifies the substitution of an allocated response time for selected RPS, and ESF sensors. The licensee has identified those RPS and ESF instrument sensors and models in its submittal. Those sensors are covered by the Topical Report CE-NPSD-1167. In conjunction with this TS change request, the licensee committed to modify or develop new procedures to perform a hydraulic response time test prior to installation of any new pressure sensor or following maintenance activities that could adversely affect sensor response time. Based on the above evaluation, the NRC staff finds that the licensee has implemented the applicable plant-specific conditions stated in the generic CEOG topical report.

#### Evaluation Summary

Based on the considerations discussed above, the NRC staff finds that the licensee has implemented the provision of the generic safety evaluation report for RTT elimination and satisfied the applicable plant-specific conditions in accordance with the approved CEOG Topical

Report CE-NPSD-1167. The proposed changes are based on the TSTF Traveler 368, Revision 0, which was incorporated into Revision 2 of the NUREG-1432, "Standard Technical Specifications Combustion Engineering Plants." Therefore, the NRC staff concludes that the proposed TS modifications for selected instrument RTT elimination are acceptable.

#### 5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arkansas State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 55016, dated October 31, 2001). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: H. Li

Date: March 26, 2002

Arkansas Nuclear One

cc:

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