

April 16, 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: 480 VOLT BUS DEGRADED VOLTAGE SETTINGS (TAC NO. MB3132)

Dear Mr. Anderson:

The Commission has issued the enclosed Amendment No. 243 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.

The amendment revises TS Table 3.3-4, "Engineered Safety Feature Actuation System Instrumentation Trip Values," Functional Unit 7.b, "Loss of Power, 460 volt Emergency Bus Undervoltage," by changing the referenced bus from the 460 volt (V) to the 480 V bus, by removing the trip setpoint, and by slightly increasing the range of allowable values for the degraded voltage setting and its associated time delay.

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 Michael Webb for/

Thomas W. Alexion, 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. 243 to NPF-6
2. Safety Evaluation

cc w/encls: See next page

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ENTERGY OPERATIONS, INC.

DOCKET NO. 50-368

ARKANSAS NUCLEAR ONE, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 243
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, 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.243 , are hereby incorporated in the license. The licensee 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: April 16, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 243

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

3/4 3-17

Insert

3/4 3-17

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 243 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, 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 revise TS Table 3.3-4, "Engineered Safety Feature Actuation System Instrumentation Trip Values," Functional Unit 7.b, "Loss of Power, 460 volt Emergency Bus Undervoltage," by changing the referenced bus from the 460 volt (V) to the 480 V bus, by removing the trip setpoint, and by slightly increasing the range of allowable values for the degraded voltage setting and its associated time delay.

2.0 BACKGROUND

The present TS Table 3.3-4 provides a range of allowable values and trip setpoint for the 480 V bus degraded voltage relay requirements. The proposed TS change increases the existing range of allowable values by accounting for channel uncertainties and calibration tolerances in accordance with industry guidance and provides better protection against unnecessary relay actuation during system transients. Also, the proposed TS change relocates trip setpoint criteria to station procedures.

3.0 DISCUSSION

Two levels of undervoltage protection (i.e., Loss of Voltage and Degraded Voltage) are provided for the ANO-2 on-site power system. There are two redundant and independent 4160 V safety buses (2A3 and 2A4) and each safety bus has loss-of-voltage protection. The loss-of-voltage protection is provided by two inverse time undervoltage relays on each of the 4160 V safety buses that isolate the safety buses upon detection of loss of voltage, initiate load shedding, and start the associated emergency diesel generators (EDG) within one second of a total loss of voltage. The isolation of the safety buses is approximately delayed another two seconds (for a total delay of approximately three seconds) to enable the offsite power to supply the safety loads in the event of a fast transfer failure. The two 4160 V loss-of-voltage relays per safety bus, as discussed above, are connected in parallel such that single relay failure will not

prevent isolation of the associated bus from its offsite power source. No revisions associated with these relays are proposed in this submittal, since a change to increase a range of acceptable values for the 4160 V Loss of Voltage Relays was approved by the staff in TS Amendment 200 (Safety Evaluation dated January 26, 1999) for ANO-2.

The second level of undervoltage protection is provided by two definite time undervoltage degraded voltage relays on each of the 480 V safety buses (2B5 and 2B6) for degraded voltage conditions. The two degraded undervoltage relays on each bus are connected in series to give the coincidence logic required to detect a sustained undervoltage condition. The 480 V bus degraded voltage relays are set based on long-term motor voltage requirements, plus the maximum feeder voltage drop allowance, resulting in a nominal 92 percent setting of motor rated voltage of 460 V. Upon voltage degradation to 92 percent of 460 V and after a delay of eight seconds, both relays must operate to isolate the associated safety related 4160 V bus from offsite power and start and connect the associated EDG. The relays are delayed eight seconds to prevent spurious operation of the relays when large motors start on the safety related 4160 V and 480 V buses.

The limiting condition for operation trip setpoint and allowable values for 480 V degraded voltage relay settings are specified in TS 3.3.2.1 Table 3.3-4, Functional Unit 7.b. The trip setpoint is specified as 423 +/- 2.0 V with an 8.0 +/- 0.5 second time delay, and the allowable value is specified as 423 +/- 4.0 V with an 8.0 +/- 0.8 second time delay. By letter dated October 2, 2001, the licensee requested approval of the proposed TS changes to replace the trip setpoint with Note (4) and the allowable values for 480 V degraded voltage relay settings.

The proposed changes were requested in accordance with Sections 2.101, 50.59, and 50.90 of Title 10 of the *Code of Federal Regulations* (CFR) to assure continued compliance with 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 17, "Electric Power Systems," and GDC 18, "Inspection and Testing of Electric Power Systems."

4.0 EVALUATION

The trip setpoint and allowable values for 480 V bus degraded voltage relays (two each on safety related 480 V load center buses 2B5 and 2B6) are specified in TS 3.3.2.1 Table 3.3-4, item 7.b as 423 +/- 2.0 V with an 8.0 +/- 0.5 second time delay and 423 +/- 4.0 V with an 8.0 +/- 0.8 second time delay respectively. The 480 V bus trip setpoint and allowable values for TS 3.3.2.1 Table 3.3-4, Functional Unit 7.b. are the same values as given in the original issuance of the ANO-2 operating license. Based on operating experience since the issuance of the original ANO-2 operating license, the licensee has improved relay setpoint calculational methods and gained a better understanding of the plant's response to sustained undervoltage.

The licensee is proposing to remove the relay trip setpoint values from the TS Table 3.3-4 and replace them with reference to Note (4) consistent with Amendment 200 dated January 26, 1999, to the ANO-2 TS. The proposed Note (4) reads, "The trip value for this function is listed in the surveillance test procedures. The trip value will ensure that adequate protection is provided when all the applicable calibration tolerances, channel uncertainties, and time delays are taken into account." The trip setpoint values selected will be equal to or more conservative than the allowable values, taking into account any additional margins that may be necessary. The licensee is proposing to change the 480 V degraded voltage relay setting allowable values at this time to bring them into conformance with changes that have developed throughout the

industry. Based on recently completed design calculation revisions, the licensee has found that a wider range of relay allowable values than those currently specified in TS 3.3.2.1 Table 3.3-4, item 7.b will provide the necessary degraded voltage detection and protection. Also, based on the revised design calculations, the licensee has found that a slightly increased range of relay setting values will provide the necessary degraded voltage protection. Therefore, the licensee has proposed to change the range of allowable values for setting the degraded voltage relays from 423 +/- 4.0 V with an 8.0 +/- 0.8 second time delay to 429.6 +/- 6.4 V with an 8.0 +/- 1.0 second time delay.

The proposed allowable values of degraded voltage relays are equivalent to nominal 92 percent of the motor's rated voltage of 460 V to account for voltage drop, channel uncertainties, and calibration tolerances. The licensee claims that the new proposed allowable values for the degraded voltage relays were arrived at per the guidance of ANO-2 Design Guide 2DG-001, "Instrument Loop Error Analysis and Setpoint Methodology Manual." The proposed degraded voltage relay setpoints will provide slightly more protection for the safety equipment from the effects of degraded voltage conditions than the current degraded voltage relay settings. The licensee has indicated that, based on the results of ANO-2 calculations, the proposed degraded voltage relay settings will not jeopardize the operability of the offsite power source for the analyzed minimum normal grid voltage conditions. The slight increase in the range of allowable values for the degraded voltage time delay remains well within the assumption of the accident analysis. The staff agrees that the proposed change to the allowable values for the 480 V bus degraded voltage relays incorporates industry guidance for setpoint uncertainty and enhances the protection of class 1E equipment from degraded voltage conditions. The staff has determined that the slightly increased range of allowable values for the degraded voltage relays will provide the necessary safety function for degraded voltage conditions without compromising the reliability of the offsite power source. Also, the staff agrees that the relocation of the trip setpoint values to station surveillance procedures will allow the licensee flexibility to account for any relay drift, additional margins or uncertainties, while ensuring that the degraded voltage relays are set to perform their intended safety function within the acceptable range of allowable values. The staff has concluded that the proposed revised settings for the degraded voltage protection relays will continue to provide the safety function of protecting the class 1E equipment from the effects of a low voltage condition. Further, the proposed changes are equivalent to what is specified in NUREG-1432, "Standard Technical Specifications for Combustion Engineering Plants." Therefore the proposed changes are acceptable.

In addition, the licensee proposed to modify the reference to the 460 V Emergency Bus in Table 3.3-4, Functional Unit 7.b to read "480 volt Emergency Bus Undervoltage." The proposed change from 460 V to 480 V provides consistency with the station procedures, actual bus design, and with TSs. The staff finds that this proposed change is of an administrative nature and is therefore acceptable.

Evaluation Summary

Based on the above, the staff concludes that an increased range of allowable values for the 480 V degraded voltage relays will continue to provide the necessary safety function for the ANO-2 4160 V and 480 V safety buses. The proposed changes to the range of allowable values for the 480 V degraded voltage relays adopt industry guidance for setpoint uncertainty, and enhance the low voltage protection for the safety equipment without compromising the reliability of the offsite power system. The proposed changes are also in conformance with the guidance of Revision 1 of NUREG-1432. The proposed changes requested by the licensee for

ANO-2 480 V degraded voltage relays are similar to that approved by the staff in TS Amendment 200 for the 4160 V Loss of Voltage Relays (Safety Evaluation Report dated January 26, 1999) for ANO-2. Therefore, the proposed changes 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 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 55015, 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: P. Gill

Date: April 16, 2002

Arkansas Nuclear One

cc:

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