

May 10, 2000

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

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 1 - ISSUANCE OF AMENDMENT
RE: ENGINEERED SAFEGUARDS ACTUATION SYSTEM LOW REACTOR
COOLANT SYSTEM PRESSURE SETPOINT (TAC NO. MA6401)

Dear Mr. Hutchinson:

The Commission has issued the enclosed Amendment No. 207 to Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit No. 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated August 18, 1999 (1CAN089903), as supplemented by letter dated April 20, 2000 (1CAN040003).

The amendment revised TS 3.5.3, "Safety Feature Actuation System Setpoints," and its associated Bases to allow for an increase to the low reactor coolant system pressure setpoint. This setpoint change was requested to account for additional instrument uncertainties associated with cable insulation resistance effects and to allow for the plugging of up to 1200 tubes in each steam generator.

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/

M. Christopher Nolan, Project Manager, Section 1
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosures: 1. Amendment No. 207 to DPR-51
2. Safety Evaluation

cc w/encls: See next page

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENTERGY OPERATIONS INC.

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 207
License No. DPR-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Entergy Operations, Inc. (the licensee) dated August 18, 1999, as supplemented by letter dated April 20, 2000, 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. DPR-51 is hereby amended to read as follows:

2. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 207, 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 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



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

Attachment: Changes to the Technical
Specifications

Date of Issuance: May 10, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 207

FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

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

49
50

Insert

49
50

3.5.3 Safety Features Actuation System Setpoints

Applicability

This specification applies to the safety features actuation system actuation setpoints.

Objective

To provide for automatic initiation of the safety features actuation system in the event of a breach of reactor coolant system integrity.

Specification

The safety features actuation setpoints and permissible bypasses shall be as follows:

<u>Functional Unit</u>	<u>Action</u>	<u>Setpoint</u>
High Reactor Building Pressure*	Reactor Building Spray	≤30 psig (44.7 psia)
	High Pressure Injection	≤ 4 psig (18.7 psia)
	Start of Reactor Building Cooling and Reactor Building Isolation	≤ 4 psig (18.7 psia)
	Reactor Bldg. Ventilation	≤ 4 psig (18.7 psia)
	Low Pressure Injection	≤ 4 psig (18.7 psia)
	Penetration Room Ventilation	≤ 4 psig (18.7) psia)
Low Reactor Coolant System Pressure**	High Pressure Injection	≥ 1585 psig
	Low Pressure Injection	≥ 1585 psig
	Start of Reactor Building Cooling and Reactor Building Isolation	≥ 1585 psig

*May be bypassed during reactor building leak rate test.

**May be bypassed below 1750 psig and is automatically reinstated above 1750 psig.

With the safety features actuation setpoints less conservative than the above values, declare the channel inoperable and apply the applicable Action requirements of Table 3.5.1-1 until the channel is restored to OPERABLE status with the trip setpoint adjusted consistent with the trip setpoint value.

Bases

High Reactor Building Pressure

The basis for the 30 psig and 4 psig setpoints for the high pressure signal is to establish a setting which would be reached in adequate time in the event of a DBA, cover a spectrum of break sizes and yet be far enough above normal operation maximum internal pressure to prevent spurious initiation.

Low Reactor Coolant System Pressure

The basis for the 1585 psig low reactor coolant pressure setpoint for high and low pressure injection initiation is to establish a value which is high enough such that protection is provided for the entire spectrum of break sizes and is far enough below normal operating pressure to prevent spurious initiation. (1)

REFERENCES

- (1) FSAR, Section 14.2.2.5
- (2) B&W Calculation 32-1158581



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 207 TO

FACILITY OPERATING LICENSE NO. DPR-51

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO. 1

DOCKET NO. 50-313

1.0 INTRODUCTION

By letter dated August 18, 1999 (1CAN089903), as supplemented by letter dated April 20, 2000 (1CAN040003), Entergy Operations, Inc. (EOI or the licensee), submitted a request for changes to the Arkansas Nuclear One, Unit No. 1 (ANO-1), Technical Specifications (TSs). The requested changes would revise TS 3.5.3, "Safety Feature Actuation System Setpoints," and its associated Bases to allow for an increase to the low reactor coolant system (RCS) pressure setpoint. This setpoint change was requested to account for additional instrument uncertainties associated with cable insulation resistance effects, and to allow for the plugging of up to 1200 tubes in each steam generator. The proposed change adjusts the low RCS pressure setpoint in a conservative direction, resulting in an early initiation of the engineered safeguards actuation system (ESAS) on a decreasing RCS pressure.

The April 20, 2000, letter provided clarifying information that did not change the scope of the August 18, 1999, application and the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The ESAS monitors two parameters for indications of a major transient, such as a loss-of-coolant accident (LOCA), that would challenge fuel cladding integrity and reactor building integrity. The parameters monitored are RCS pressure and reactor building pressure. During a LOCA, these two parameters provide early and positive evidence of the transient. ESAS would respond through an automatic initiation of high pressure injection, low pressure injection, reactor building cooling, and the closure of certain valves in the reactor building isolation system. Based on the safety analysis, the analytical value for the required initiation of ESAS due to at low RCS pressure has been determined to be 1480 psig (pounds per square inch gauge). This value is documented in Final Safety Analysis Report (FSAR) Section 14.2.2.1.3.1.f and FSAR Table 14.19a. The analytical value is then adjusted in the conservative direction to account for instrument loop uncertainties, as well as steam generator tube plugging. Currently, TS 3.5.3 requires a setpoint of ≥ 1526 psig for the low RCS pressure functional unit. This value includes an allowance for up to 1000 plugged tubes in each of the two once-through steam generators. This value is selected so that it is high enough to ensure

that protection is provided for the entire spectrum of postulated RCS break sizes and is far enough below normal operating pressure to prevent a spurious initiation.

The reactor protective system (RPS) monitors parameters related to safe operations and trips the reactor to protect the reactor core against fuel rod cladding damage in the event that an adverse transient condition is detected. The RPS also assists in protecting against RCS damage caused by high system pressure by limiting the energy input to the system through reactor trip action. The RPS is designed to provide the necessary protection to insure that certain safety limits and accident analysis acceptance criteria is not violated. High and low RCS pressure are monitored by the RPS. The RPS will initiate a reactor trip at 1800 psig to maintain the departure from nucleate boiling (DNB) ratio greater than or equal to the minimum allowable DNB ratio for those accidents that result in a pressure reduction. TS 2.3.1.C, "Limiting Safety System Settings, Protective Instrumentation - RCS Pressure," provides the requirement to establish a setpoint of 1800 psig for a reactor trip on low RCS pressure.

During controlled plant maneuvers, it is necessary for plant operations to bypass the low RCS pressure functional unit to prevent an automatic initiation of ESAS when purposely depressurizing the RCS. TS 3.5.3 allows the low RCS pressure functional unit to be bypassed when pressure is below 1750 psig and requires that it is automatically reinstated when pressure is above 1750 psig. Procedures, panel alarms, and computer alarms are available to alert the operator that an ESAS low RCS pressure actuation is imminent, if not bypassed within a reasonable amount of time. The RCS pressure LO LO alarm setpoint was set at 1550 psig to provide such a warning.

The allowances for the loop uncertainties associated with the setpoint for the low RCS pressure functional unit were reviewed by the licensee. This review demonstrated that the value list in TS 3.5.3 was non-conservative in that it did not account for all instrument uncertainties. The allowance for instrument uncertainties associated with the effects of cable insulation resistance were found to be inadequate. A revised calculation was performed and determined that the setpoint should be raised by an additional 16 psig to properly bound instrument uncertainties. In addition, the licensee decided to include additional margin and an allowance for plugging a maximum of 1200 steam generator tubes in each steam generator when establishing the proposed setpoint. The previous allowance for steam generator tube plugging was 1000 tubes for each steam generator. The licensee has proposed a RCS pressure setpoint of ≥ 1585 psig.

The setpoint calculation for this limiting safety system setting was performed in accordance with the guidelines set forth in EOI Design Guideline IDG-001, "Instrument Loop Error and Setpoint Methodology Manual." Although ANO-1 is not committed to strict compliance with Instrument Society of America Standard, ISA-S67.04 - 1982, "Setpoints for Nuclear Safety Related Instrumentation Used in Nuclear Power Plants," the requirements of this standard were used to develop IDG-001 and is an integral part of the ANO-1 setpoint program. The statistical method of the square root of the sum of the squares was used to determine the random error on a component level and for the loop. Non-random errors were combined algebraically with the random error term to establish total error. In addition, these calculations are performed assuming a 95/95 tolerance limit.

As a result of this change, the RCS pressure LO LO alarm setpoint would be increased to 1640 psig to alert the operator in sufficient time to establish that an ESAS low RCS pressure actuation is imminent, if not bypassed prior to reaching a pressure of approximately 1585 psig.

3.0 EVALUATION

The NRC staff has reviewed the licensee's submittal with respect to the applicable portions of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," and the ANO-1 TSs and FSAR. The staff has determined that the licensee's proposal does not change any of the inputs, assumptions, or conclusions of the bounding design basis accident analyses as described in FSAR Chapter 14. The low RCS pressure reactor trip setpoint remains unchanged at 1800 psig. The analytical value for the initiation of ESAS on low RCS pressure remains unchanged at 1480 psig. The licensee's proposed change to increase the ESAS setpoint for low RCS pressure to fully account for instrument uncertainties and future steam generator tube plugging needs is conservative. The methodology used to establish the total loop uncertainty is consistent with the current licensing basis for ANO-1. The proposed setpoint of ≥ 1585 psig is well below the normal operating band for RCS pressure and approximately 215 psig below the reactor trip setpoint for low RCS pressure. Therefore, the proposed change does not significantly increase the likelihood of an inadvertent ESAS initiation due to a plant transient that does not involve a LOCA and does not require an ESAS initiation for recovery. The ESAS low RCS pressure functional unit may be bypassed below 1750 psig when purposely depressurizing the RCS. The proposed setpoint for the low reactor coolant pressure functional unit is sufficiently below the bypass value such that this operation can be accomplished without an undue challenge to the plant operations staff. Therefore, the staff finds the proposed change acceptable.

4.0 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.

5.0 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 (65 FR 4270, January 26, 2000). 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.

6.0 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

August 18, 1999, application as supplemented by letter dated April 20, 2000, and the initial proposed no significant hazards consideration determination. 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: C. Nolan

Date: May 10, 2000