

Mr. C. Randy Hutchinson
Vice President, Operations ANO
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72801

SUBJECT: EXEMPTION FROM REQUIREMENTS OF 10 CFR 50.60, ACCEPTANCE CRITERIA FOR FRACTURE PREVENTION FOR LIGHTWATER NUCLEAR POWER REACTORS FOR NORMAL OPERATION - ARKANSAS NUCLEAR ONE, UNIT 1 (TAC NO. M97529)

Dear Mr. Hutchinson:

The Commission has issued the enclosed exemption for Arkansas Nuclear One, Unit 1 from the requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention for Lightwater Nuclear Power Reactors for Normal Operation." This exemption permits using the safety margins recommended in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (Code) Case N-514, "Low Temperature Overpressure Protection" in lieu of the safety margins required by 10 CFR Part 50, Appendix G.

A copy of this Exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,
ORIGINAL SIGNED BY:
George Kalman, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50- 313

Enclosure: Exemption

cc w/encl: See next page

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

March 12, 1997

Mr. C. Randy Hutchinson
Vice President, Operations AND
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72801

SUBJECT: EXEMPTION FROM REQUIREMENTS OF 10 CFR 50.60, ACCEPTANCE CRITERIA FOR
FRACTURE PREVENTION FOR LIGHTWATER NUCLEAR POWER REACTORS FOR NORMAL
OPERATION - ARKANSAS NUCLEAR ONE, UNIT 1 (TAC NO. M97529)

Dear Mr. Hutchinson:

The Commission has issued the enclosed exemption for Arkansas Nuclear One, Unit 1 from the requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention for Lightwater Nuclear Power Reactors for Normal Operation." This exemption permits using the safety margins recommended in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (Code) Case N-514, "Low Temperature Overpressure Protection" in lieu of the safety margins required by 10 CFR Part 50, Appendix G.

A copy of this Exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

A handwritten signature in cursive script, reading "George Kalman", is written over a horizontal line.

George Kalman, Senior Project Manager
Project Directorate IV-1
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-313

Enclosure: Exemption

cc w/encl: See next page

Mr. C. Randy Hutchinson
Entergy Operations, Inc.

Arkansas Nuclear One, Unit 1

cc:

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& Chief Operating Officer
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Russellville, AR 72801

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	
ENTERGY OPERATIONS, INC.)	Docket No. 50-313
)	
(Arkansas Nuclear One, Unit 1))	

EXEMPTION

I.

Entergy Operations, Inc. (the licensee) is the holder of Facility Operating License No. DPR-51, which authorizes operation of Arkansas Nuclear One, Unit 1. The license provides, among other things, that the licensee is subject to all rules, regulations, and orders of the Commission now or hereafter in effect.

The facility consists of two pressurized water reactors, Arkansas Nuclear One, Units 1 and 2, located at the licensee's site in Pope County, Arkansas.

II.

In its letter dated November 26, 1996, the licensee requested an exemption from the Commission's regulations for Arkansas Nuclear One, Unit 1. Title 10 of the Code of Federal Regulations, Part 50, Section 60 (10 CFR 50.60), "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation," states that all

lightwater nuclear power reactors must meet the fracture toughness and material surveillance program requirements for the reactor coolant pressure boundary as set forth in Appendices G and H to 10 CFR Part 50. Appendix G to 10 CFR Part 50 defines pressure/temperature (P/T) limits during any condition of normal operation, including anticipated operational occurrences and system hydrostatic tests to which the pressure boundary may be subjected over its service lifetime. It is specified in 10 CFR 50.60(b) that alternatives to the described requirements in Appendices G and H to 10 CFR Part 50 may be used when an exemption is granted by the Commission under 10 CFR 50.12.

The licensee relies on the electromatic relief valve (ERV) to provide low temperature overpressure protection (LTOP). The ERV is mounted on the pressurizer and helps to control pressure transients during power operations. However, when the reactor is heating up or cooling down and the primary system pressure and temperature are reduced, the ERV is reset to the LTOP mode. In the LTOP mode the setpoint to open the ERV is low enough to prevent pressure transients from exceeding applicable P/T limits. Some margin should be maintained between the primary system pressure and the LTOP setpoint to prevent the ERV from lifting as a result of normal operating pressure surges.

The licensee has requested the use of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Case N-514, "Low Temperature Overpressure Protection," which allows exceeding the Appendix G safety limits by 10 percent. ASME Code Case N-514, the proposed alternate methodology, is consistent with guidelines developed by the ASME Working Group on Operating Plant Criteria to define pressure limits during LTOP events that avoid certain unnecessary operational restrictions, provide adequate margins

against failure of the reactor pressure vessel, and reduce the potential for unnecessary activation of pressure-relieving devices used for LTOP. Code Case N-514 has been approved by the ASME Code Committee. The content of this code case has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI.

III.

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 (1) when the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. Special circumstances are present whenever, according to 10 CFR 50.12(a)(2)(ii), "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule...."

The underlying purpose of 10 CFR 50.60, Appendix G, is to establish fracture toughness requirements for ferritic materials of pressure-retaining components of the reactor coolant pressure boundary to provide adequate margins of safety during any condition of normal operation, including anticipated operational occurrences, to which the pressure boundary may be subjected over its service lifetime. Section IV.A.2 of this appendix requires that the reactor vessel be operated with P/T limits at least as conservative as those obtained by following the methods of analysis and the required margins of safety of Appendix G of the ASME Code.

Appendix G of the ASME Code requires that the P/T limits be calculated: (a) using a safety factor of two on the principal membrane (pressure) stresses, (b) assuming a flaw at the surface with a depth of one-quarter (1/4) of the vessel wall thickness and a length of six (6) times its depth, and (c) using a conservative fracture toughness curve that is based on the lower bound of static, dynamic, and crack arrest fracture toughness tests on material similar to the ANO-1 reactor vessel material.

In determining the setpoint for LTOP events, the licensee proposed to use safety margins based on an alternate methodology consistent with the ASME Code Case N-514 guidelines. The ASME Code Case N-514 allows determination of the setpoint for LTOP events such that the maximum pressure in the vessel would not exceed 110 percent of the P/T limits of the existing ASME Appendix G. This results in a safety factor of 1.8 on the principal membrane stresses. All other factors, including assumed flaw size and fracture toughness, remain the same. Although this methodology would reduce the safety factor on the principal membrane stresses, the proposed criteria will provide adequate margins of safety to the reactor vessel during LTOP transients and, thus, will satisfy the underlying purpose of 10 CFR 50.60 for fracture toughness requirements. Further, by relieving the operational restrictions, the potential for undesirable lifting of the ERV would be reduced, thereby improving plant safety.

IV.

For the foregoing reasons, the NRC staff has concluded that the licensee's proposed use of the alternate methodology in determining the

acceptable setpoint for LTOP events will not present an undue risk to public health and safety and is consistent with the common defense and security. The NRC staff has determined that there are special circumstances present, as specified in 10 CFR 50.12(a)(2), in that application of 10 CFR 50.60 is not necessary in order to achieve the underlying purpose of this regulation.


Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), an exemption is authorized by law, will not endanger life or property or common defense and security, and is, otherwise, in the public interest. Therefore, the Commission hereby grants an exemption from the requirements of 10 CFR 50.60 such that in determining the setpoint for LTOP events, the Appendix G curves for P/T limits are not exceeded by more than 10 percent in order to be in compliance with these regulations. This exemption is applicable only to LTOP conditions during normal operation.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (62 FR 11482).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 12th day of March 1997.

FOR THE NUCLEAR REGULATORY COMMISSION


Samuel J. Collins, Director
Office of Nuclear Reactor Regulation



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

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GKAlman

March 12, 1997

MEMORANDUM TO: Rules Review and Directives Branch
Division of Freedom of Information and Publications Services
Office of Administration

FROM: Office of Nuclear Reactor Regulation

SUBJECT: ENTERGY OPERATIONS, INC. - ARKANSAS NUCLEAR ONE, UNIT 1

One signed original of the *Federal Register* Notice identified below is attached for your transmittal to the Office of the Federal Register for publication. Additional conformed copies (five) of the Notice are enclosed for your use.

- ☐ Notice of Receipt of Application for Construction Permit(s) and Operating License(s).
- ☐ Notice of Receipt of Partial Application for Construction Permit(s) and Facility License(s): Time for submission of Views on Antitrust matters.
- ☐ Notice of Consideration of Issuance of Amendment to Facility Operating License. (Call with 30-day insert date).
- ☐ Notice of Receipt of Application for Facility License(s); Notice of Availability of Applicant's Environmental Report; and Notice of Consideration of Issuance of Facility License(s) and Notice of Opportunity for Hearing.
- ☐ Notice of Availability of NRC Draft/Final Environmental Statement.
- ☐ Notice of Limited Work Authorization.
- ☐ Notice of Availability of Safety Evaluation Report.
- ☐ Notice of Issuance of Construction Permit(s).
- ☐ Notice of Issuance of Facility Operating License(s) or Amendment(s).
- ☐ Order.
- ☒ Exemption.
- ☐ Notice of Granting Exemption.
- ☐ Environmental Assessment.
- ☐ Notice of Preparation of Environmental Assessment.
- ☐ Receipt of Petition for Director's Decision Under 10 CFR 2.206.
- ☐ Issuance of Final Director's Decision Under 10 CFR 2.206.
- ☐ Other: _____

DOCKET NO. 50-313

Attachment(s): As stated

Contact: G. Kalman
Telephone: 415-1300

LA/PDA-1
CHawes
GKAlman