

July 15, 1996

Mr. Jerry W. Yelverton  
Vice President, Operations ANO  
Entergy Operations, Inc.  
1448 S. R. 333  
Russellville, AR 72801

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 - ENVIRONMENTAL ASSESSMENT RELATED TO  
CODE CASE N-514 EXEMPTION (TAC NO. M77399)

Dear Mr. Yelverton:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for exemption from the requirements of 10 CFR 50.60 dated April 11, 1996. The proposed exemption would allow Arkansas Nuclear One, Unit 2 to utilize the American Society of Mechanical Engineers Boiler and Pressure Vessel Code Case N-514, "Low Temperature Overpressure Protection" to determine its low temperature overpressure protection setpoints.

The assessment is being 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 No. 50-368

Enclosure: Environmental Assessment

cc w/encl: See next page

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

July 12, 1996

Mr. Jerry W. Yelverton  
Vice President, Operations ANO  
Entergy Operations, Inc.  
1448 S. R. 333  
Russellville, AR 72801

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Sincerely,

A handwritten signature in black ink that reads "George Kalman".

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

Docket No. 50-368

Enclosure: Environmental Assessment

cc w/encl: See next page

Mr. Jerry W. Yelverton  
Entergy Operations, Inc.

Arkansas Nuclear One, Unit 2

cc:

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UNITED STATES NUCLEAR REGULATORY COMMISSION  
ENERGY OPERATIONS, INC.  
DOCKET NO. 50-368  
ARKANSAS NUCLEAR ONE, UNIT 2  
ENVIRONMENTAL ASSESSMENT AND FINDING OF  
NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an exemption from certain requirements of its regulations to Facility Operating License No. NPF-6, issued to Entergy Operations, Inc. (the licensee), for operation of Arkansas Nuclear One, Unit 2, located in Pope County, Arkansas.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The proposed action would allow the licensee to utilize American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Case N-514, "Low Temperature Overpressure Protection" to determine its low temperature overpressure protection (LTOP) setpoints and is in accordance with the licensee's application for exemption dated April 11, 1996. The proposed action requests an exemption from certain requirements of 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Lightwater Nuclear Power Reactors for Normal Operation," to allow application of an alternate methodology to determine the LTOP setpoints for ANO-2. The proposed alternate methodology is consistent with guidelines developed by the ASME Working Group on Operating Plant Criteria (WGOPC) 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. These guidelines have been incorporated into Code Case N-514, "Low Temperature Overpressure Protection," which 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. However, 10 CFR 50.55a, "Codes and Standards," and Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability" have not been updated to reflect the acceptability of Code Case N-514.

The philosophy used to develop Code Case N-514 guidelines is to ensure that the LTOP limits are still below the pressure/temperature (P/T) limits for normal operation, but allow the pressure that may occur with activation of pressure relieving devices to exceed the P/T limits, provided acceptable margins are maintained during these events. This philosophy protects the pressure vessel from LTOP events, and still maintains the Technical Specifications P/T limits applicable for normal heatup and cooldown in accordance with 10 CFR Part 50, Appendix G and Sections III and XI of the ASME Code.

The Need for the Proposed Action:

Pursuant to 10 CFR 50.60, all lightwater nuclear power reactors must meet the fracture toughness requirements for the reactor coolant pressure boundary as set forth in 10 CFR Part 50, Appendix G. 10 CFR Part 50, Appendix G, defines 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 10 CFR Part 50, Appendix G, may be used when an exemption is granted by the Commission under 10 CFR 50.12.

To prevent transients that would produce excursions exceeding the 10 CFR Part 50, Appendix G, P/T limits while the reactor is operating at low temperatures, the licensee installed an LTOP system. The LTOP system includes pressure relieving devices in the form of relief valves that are set at a pressure below the LTOP enabling temperature that would prevent the pressure in the reactor vessel from exceeding the P/T limits of 10 CFR Part 50, Appendix G. To prevent these valves from lifting as a result of normal operating pressure surges (e.g., reactor coolant pump starting and shifting operating charging pumps) with the reactor coolant system in a solid water condition, the operating pressure must be maintained below the relief valve setpoint.

In addition, to prevent damage to reactor coolant pump seals, the operator must maintain a minimum differential pressure across the reactor coolant pump seals. Hence, the licensee must operate the plant in a pressure window that is defined as the difference between the minimum required pressure to start a reactor coolant pump and the operating margin to prevent lifting of the relief valves due to normal operating pressure surges. The 10 CFR Part 50, Appendix G, safety margin adds instrument uncertainty into the LTOP setpoint. The licensee's current LTOP analysis indicates that using this 10 CFR Part 50, Appendix G, safety margin to determine the relief valve setpoint would result in an operating window between the LTOP setpoint and the

minimum pressure required for reactor coolant pump seals which is too small to permit continued operation. Operating with these limits could result in the lifting of relief valves or damage to the reactor coolant pump seals during normal operation. Using Code Case N-514 would allow the licensee to recapture most of the operating margin that is lost by factoring in the instrument uncertainties in the determination of the LTOP setpoint. Therefore, the licensee proposed that in determining the relief valve setpoint for LTOP events for ANO-2, the allowable pressure be determined using the safety margins developed in an alternate methodology in lieu of the safety margins required by 10 CFR Part 50, Appendix G. The alternate methodology is consistent with ASME Code Case N-514. 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.

An exemption from 10 CFR 50.60 is required to use the alternate methodology for calculating the maximum allowable pressure for LTOP considerations. By application dated April 11, 1996, the licensee requested an exemption from 10 CFR 50.60 to allow it to utilize the alternate methodology of Code Case N-514 to compute its LTOP setpoints.

Environmental Impacts of the Proposed Action:

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-2 reactor vessel material.

In determining the relief valve setpoint for LTOP events, the licensee proposed the use of safety margins based on an alternate methodology consistent with the proposed ASME Code Case N-514 guidelines. ASME Code Case N-514 allows determination of the setpoint for LTOP events such that the maximum pressure in the vessel will not exceed 110% 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, use of the proposed criteria will provide adequate margins of safety to the reactor vessel during LTOP transients.

The change will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released offsite, and there is no significant increase in the allowable individual or cumulative occupational radiation exposure. Accordingly, the Commission concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential nonradiological impacts, the proposed action does involve features located entirely within the restricted area as defined in 10 CFR Part 20. It does not affect nonradiological plant effluents and has no other environmental impact. Accordingly, the Commission concludes that there are no significant nonradiological environmental impacts associated with the proposed action.



Alternatives to the Proposed Action:

Since the Commission has concluded there is no measurable environmental impact associated with the proposed action, any alternatives with equal or greater environmental impact need not be evaluated. As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the application would result in no change in current environmental impacts. The environmental impacts of the proposed action and the alternative action are similar.

Alternative Use of Resources:

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for ANO-2.

Agencies and Persons Consulted:

In accordance with its stated policy, on May 13, 1996, the staff consulted with the Arkansas State official, Mr. Bernard Bevill Director of Radiation Control and Emergency Management, regarding the environmental impact of the proposed action. The State official had no comments.

FINDING OF NO SIGNIFICANT IMPACT

Based upon the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the Commission has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated April 11, 1996, which is available for public inspection at the Commission's Public Document Room, 2120 L Street, NW.,

Washington, DC, and at the local public document room located at the Tomlinson Library, Arkansas Tech University, Russellville, AR 72801.

Dated at Rockville, Maryland, this 15th day of July, 1966.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, appearing to read "George Kalman".

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