



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

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO THE USE OF AN ALTERNATIVE ASME CODE

ARKANSAS POWER & LIGHT COMPANY (AP&L)

ARKANSAS NUCLEAR ONE - UNIT 2 (ANO-2)

DOCKET NO.: 50-368

I. BACKGROUND

Paragraph 10 CFR 50.55a(g)(4) requires that inservice examination of ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Code except where specific written approval has been granted by the Commission. After completion of construction the repair, replacement and modification of components is implemented by the rules of ASME Section XI.

On April 22, 1987, a containment entry was made at ANO-2 to assess the potential of a small leak on one of the Safety Injection Tanks as indicated by a higher than normal make-up rate to the tank. While in the containment, a general walkdown of the Reactor Coolant System was conducted. During the walk-down, leakage in the area of the pressurizer was detected. Additional entries on April 23 and 24, 1987, determined that two small leaks existed, one from the high point vent line located over the pressurizer and another originating from the pressurizer lower head. ANO-2 was shutdown on April 24, 1987 per Technical Specifications and a 10 CFR 50.72 report was made. Following removal of insulation and visual inspection of the pressurizer lower head, the leakage source was determined to be a pressurizer heater sleeve. Boric acid wastage was also observed on the lower head adjacent to the heater penetration in an area approximately 1 1/2 inch in circumference and 3/4 inch deep. Remote internal examination revealed that two of the heaters had ruptured.

The licensee determined that a permanent repair of the pressure vessel, in accordance with currently approved ASME Code editions, is impractical to perform with current tooling limitations. In a letter dated May 12, 1987, as supplemented May 18, 1987, the licensee proposed a temporary repair by welding plugs in the two heater penetrations and requested Commission approval to use certain provisions of ASME Section III that are more recent than the document referenced in 10 CFR 50.55a(b).

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## II. RELIEF REQUEST AND SUPPORTING INFORMATION

### A. Code Requirement:

The applicable requirements for ANO-2 for repairs and replacement of components is the 1980 Edition of ASME Section XI including Addenda through Winter 1981. Subarticle IWA-4120 of this document requires that repairs shall be performed in accordance with the Owner's Design Specification and Construction Code of the component or system. Later editions of the Construction Code or of ASME Section III, either in the entirety or portions thereof, may be used. If repair welding cannot be performed in accordance with these requirements, Article IWB-4000 may be used for Class 1 components.

The original Construction Code for the pressurizer is the 1968 Edition of ASME Section III including Addenda through Summer 1970. The latest document referenced in 10 CFR 50.55a(b) is the 1983 Edition of ASME Section III including Addenda through Summer 1984.

### B. Code Relief Request:

The licensee requests Commission approval to use the temper bead weld repair technique as described in paragraph NB-4622.9 of the Winter 1985 Addenda of the 1983 Edition of ASME Section III for the temporary repair of the ANO-2 pressurizer.

### C. Bases For Request:

The licensee determined that a permanent repair based on currently referenced ASME Codes would require repair by welding from the inside of the pressurizer. The repair process would require the removal of all 96 heaters and personnel entering into the high radiation areas inside the pressurizer (10 R/hr Gamma, 12 R/hr Beta) to remove the heater support plates. During the heater removal process, which requires the heaters to be cut out, the heaters may be damaged to an extent where they could not be used again. Preliminary estimates for delivery of new replacement heaters is 22 weeks. If a sufficient number of heaters are not available following the repair ANO-2 could not be returned to operation. Following the support plate removal, a corrosion resistant repair could only be accomplished by sending personnel into the pressurizer to perform the weld repair. Additionally, the exterior of the vessel may also require welding to provide sufficient strength. If this were necessary, an elevated temperature post weld heat treatment would be required. This heat treatment could only be accomplished by placing heater blankets inside the pressurizer on the lower head wall. The above described repair would result in excessive radiation exposure to the workers performing the repair, a prolonged outage for the repair (potentially up to 22 weeks), and considerable expense to AP&L and its customers.



The Winter 1985 Addenda of ASME Section III allows temper bead welds to a depth of  $1/3$  the vessel wall thickness without performing an elevated temperature post weld heat treatment, which is required by earlier versions of the ASME Section III for weld depths of greater than  $3/8$  inch. This additional depth is necessary for the vessel repair. The temper bead weld repair technique, described in the Winter 1985 Addenda, provides an equally safe and quality alternative to the unusually difficult method of repair from the inside of the pressurizer.

### III. STAFF EVALUATION

This staff evaluation is limited to the issue of the acceptability of paragraph NB-4622.9 of the Winter 1985 Addenda of 1983 Edition of ASME Section III. During fabrication of the pressurizer, the structural and seal weld for the heater sleeve was made from the inside; then two heater support plates were installed. In accordance with the ANO-2 Inservice Inspection Program the licensee has the option of performing repairs to ASME Code Class 1 components based on requirements in the original Construction Code or editions of ASME Section III or ASME Section XI Article IWB-4000 referenced in the regulation. Pursuant to 10 CFR 50.55a(g)(5)(i) the staff evaluated the existing design, geometry and materials of construction of the pressurizer heater sleeve and the staff determined that repair by welding from the inside of the pressure vessel is impractical to perform during the current ANO-2 maintenance outage.

The ASME Code is periodically evaluated for incorporation by reference in 10 CFR 50.55a(b). The staff has completed the technical evaluation of paragraph NB-4622.9 of the Winter 1985 Addenda of ASME Section III and determined that the defined temper bead weld repair is technically acceptable. Based on the licensee's May 12, 1987 submittal the staff evaluated the repair process as related to ANO-2. ASME Codes already referenced in the regulation permit the specific repair proposed by the licensee except that the depth of repair is currently limited to  $3/8$  inch. The lower head thickness is approximately 4 inches and the heater sleeve outside diameter is approximately 1.156 inch. Boric acid wastage also resulted in an enlargement of the annulus between the XI heater sleeve and the outside surface of the pressurizer shell. Replacing the heater with a temporary plug may not require a repair weld of depth of  $1/3$  the vessel wall thickness. Based on the above considerations the staff finds acceptable the licensee's proposal to use paragraph NB-4622.9 of the Winter 1985 Addenda of ASME Section III for the interim repair.

### IV. CONCLUSION

The staff has reviewed the request and has determined that the proposed use of the newer ASME Code for the temporary repair of the ANO-2 pressurizer provides an acceptable level of quality and safety and is, therefore, acceptable under 10 CFR 50.55a(a)(3). The staff has also determined that the relief request is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden that would result if the requirements

were imposed on the ANO-2 facility. Pursuant to 10 CFR 50.55a(g)(6)(i) the staff concludes that the licensee is authorized to use paragraph NB-4622.9 of the Winter 1985 Addenda of ASME Section III for a temporary repair by welding of the pressurizer giving due consideration to the burden upon the licensee that could result if the requirements of the ASME Code editions currently referenced in the regulation were imposed on the facility. The staff will require that the licensee submit for review his plans for a permanent repair of the pressurizer by November 1, 1987.

May 22, 1987

Docket No. 50-368

Mr. T. Gene Campbell  
Vice President, Nuclear  
Operations  
Arkansas Power and Light Company  
P. O. Box 551  
Little Rock, Arkansas 72203

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Dear Mr. Campbell:

By letter dated May 12, 1987, as supplemented May 18, 1987, you submitted a request in accordance with 10 CFR 50.55a(a)(3) for approval to use the Temper Bead Weld Repair Technique as described in paragraph NB-4622.9 of the Winter 1985 Addenda of the 1983 Edition of Section III of the ASME Boiler and Pressure Vessel Code for the temporary repair of the ANO-2 pressurizer as an alternative to the Summer 1984 Addenda of the 1983 Edition of the Section III of the ASME Boiler and Pressure Vessel Code referenced in 10 CFR 50.55a(b)(1). The staff has reviewed the request and has determined that the proposed use of the newer ASME Code for the temporary repair of the ANO-2 pressurizer provides an acceptable level of quality and safety and is, therefore, acceptable under 10 CFR 50.55a(a)(3). We have also determined that pursuant to 10 CFR 50.55a(g)(6)(i), the relief request is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden that would result if the requirements were imposed on the ANO-2 facility. Our associated Safety Evaluation is enclosed.

The staff, therefore, approves your request to use the Winter 1985 Addenda of 1983 Edition of Section III of the ASME Boiler and Pressure Vessel Code for the temporary repair of the ANO-2 pressurizer.

You are requested to submit your plan for a permanent repair of the ANO-2 pressurizer no later than November 1, 1987.

Our Safety Evaluation associated with the repair will be transmitted in a separate letter.

Sincerely,

IS/

Jose A. Calvo, Director  
Project Directorate - IV  
Division of Project Directorate - III,  
IV, V and Special Projects  
Office of Nuclear Reactor Regulation

Enclosure:  
As stated

cc w/enclosure:  
See next page

\*SEE PREVIOUS PAGE FOR CONCURRENCES

PD4*	PD4*	OGC-Bethesda*
RLee: as	PNoonan	
5/22/87	5/22/87	5/22/87

PD4 *Paul*  
JACalvo *for*  
5/24/87 *SL.*



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Vice President, Nuclear  
Operations  
Arkansas Power and Light Company  
P. O. Box 551  
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Enclosure:

As stated

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JACalvo

5/12/87

*findings need to be  
revised per Tele discussion  
between JPS & P Noonan  
5/22/87*

*subject to  
revisions*

Mr. T. Gene Campbell  
Arkansas Power & Light Company

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