



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REGARDING THE REQUEST FOR EXTENSION OF RELIEF FROM ASME CODE
REQUIREMENTS FOR SERVICE WATER CONTAINMENT PENETRATIONS

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NO. 50-261

1.0 INTRODUCTION

By letter dated September 27, 1991, Carolina Power & Light Company (CP&L or the licensee) provided a plan and schedule to the Nuclear Regulatory Commission staff (the staff) for replacement of certain service water (SW) line containment penetrations at H. B. Robinson Steam Electric Plant, Unit No. 2. Included in the plan was a request for continuation of relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, requirements for certain previous temporary repairs to the SW containment penetrations. This plan, dated September 27, 1991, was submitted in compliance with a commitment made by the licensee in a previous relief request dated January 16, 1991.

In 1984, during refueling outage (RO) 9, the welds in much of the SW piping (constructed of 300 series stainless steel), both inside and outside of containment, were found to have pinhole leaks caused by microbiologically induced corrosion (MIC). During RO 9 and, subsequently, in ROs 10, 11, 12, and 13, most of the SW piping was replaced or sleeved with AL6XN pipe, a material with better MIC resistance. By the close of RO 13, the ASME Code replacements/repairs had been made to all portions of the SW pipe except two areas: 1) the supply and return lines for the containment fan cooler No. 4 (HVH-4) that runs under the refueling canal, and 2) the eight SW HVH containment penetrations.

The licensee had committed, as part of the previous relief request to replacing the supply and return lines under the refueling canal during RO 14. Replacement of the eight containment penetrations is proposed to be deferred from RO 14 to RO 15. Specific enhanced inspections and temporary repair methods are also proposed in support of the requested relief continuation.

2.0 EVALUATION

CP&L proposes the following actions in its September 27, 1991, request.

1. During RO 14 (spring 1992), CP&L will:
 - a. Replace the HVH-4 SW line (316L stainless steel) under the refueling canal with AL6XN material.

- b. Perform 100 percent RT [Radiographic Testing] of sleeve and liner welds associated with HVH-1, 2, 3, and 4 containment penetrations. Any weld found with MIC indications will be evaluated and dispositioned at that time.
 - c. Lay up, per approved methods, appropriate portions of the SW system during extended non-operating periods.
2. During Cycle 15, CP&L will:
- a. Maintain chlorination of the service water system during its operation.
 - b. Continue to perform visual inspections for leakage in the vicinity of the affected piping during the normal monthly inspections of the containment.
 - c. Lay up, as described above, if extended non-operating periods occur.
3. During RO 15 (fall 1993), CP&L will:
- a. Replace ASTM A312 grade TP304L steel liners in all eight (4 supply, 4 return) SW lines inside containment penetrations with AL6XN. The new liner will act as the pressure boundary of the SW piping inside the penetrations and meet the ASME Code requirements.
 - b. Lay-up, as described above, if extended non-operating periods occur.

Item 1b of the plan was clarified by the licensee during a conference call with the staff on January 9, 1992, and was followed up by a CP&L confirming letter of the conversation (dated January 29, 1992). Specific actions that would be performed by the licensee with regard to item 1b are:

1. Extent of MIC attack will be evaluated in accordance with NRC Generic Letter 90-05 and determination made for acceptability to leave as is until refueling outage 15.
2. If the evaluation performed in No. 1 above identifies the requirement for repair or replacement, actions detailed in Nos. 3 and 4 below will be taken.
3. Determine if replacement during RO 14 is feasible by considering the following:
 - a) accessibility
 - b) replacement material availability
 - c) engineering and craft person-hours required and as low as reasonably achievable considerations (ALARA) as related to the outage schedule.

4. If replacement during the scheduled RO 14 is not feasible, relief will be requested for the installation of temporary sleeves. Permanent pipe replacement will be made during RO 15.

The proposed temporary repairs would consist of the installation of an external pipe sleeve over the degraded weld. A seal weld would be used to attach the sleeve to the existing pipe to provide an alternate pressure boundary. The sleeve and welds would meet ASME Code requirements. This repair is classified as temporary, primarily because the materials employed (readily available 300 series stainless) are susceptible to MIC.

By way of the submitted plan, the licensee has requested continuation of relief for the replacement of the eight SW containment penetrations. The requested deferment is from RO 14 to RO 15. The need to defer the penetration piping permanent repairs until RO 15 is based on the extensive engineering and construction planning effort for the work. These efforts cannot be completed in time to support installation during RO 14. Until engineering and construction planning are complete, the availability of all needed materials is also uncertain. In addition, this replacement job will incur a high radiation dose, presently estimated to be 124 person-rem, due to the location of the penetrations. The additional planning time available with an RO 15 implementation will allow improvements in dose planning so that ALARA considerations can be assured.

Engineering analysis by the staff finds the existing and proposed temporary repairs to be adequate to ensure continued safe operation. This is due to the technical strength of the proposal which includes both design and operational considerations. The most important of these considerations is the additional ASME Code pressure boundary provided by the sleeves. A secondary consideration is the performance history of the stainless materials for the durations proposed. Although 300 series stainless steel will not last the life of the plant, it is demonstrated by way of the existing temporary repairs that it is adequate for the proposed duration. Finally, operational changes to reduce MIC, such as SW chlorination, should extend the service life of the remaining stainless steel sections.

3.0 CONCLUSION

In accordance with the requirements of 10 CFR 50.55a, the NRC staff has reviewed the information submitted by CP&L in support of the continued relief associated with the weld repair of the service water system at HBR-2. The staff concludes that compliance with the ASME Code requirements would be impractical to perform and that performance of the temporary non-code repair proposed in the plan submitted in the licensee's September 27, 1991, letter, as supplemented January 29, 1992, would provide an acceptable level of quality and safety. The staff has determined that granting relief, pursuant to 10 CFR 50.55a(a)(3)(i), (a)(3)(iii), or (g)(6)(i), 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 upon CP&L that could result if the ASME Code requirements were imposed on the facility. This relief is granted until the completion of R0 15 scheduled for late 1993.

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