



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUEST FOR RELIEF FROM CODE-REQUIRED REPAIR

CAROLINA POWER & LIGHT COMPANY

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

DOCKET NO. 50-261

1.0 INTRODUCTION

1.1 Purpose

The purpose of this evaluation is to determine the acceptability of granting relief to Carolina Power & Light Company (the licensee or CP&L) from the Section XI repair requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (Code) for repair of a leaking pipe in the chemical and volume control system (CVCS).

1.2 Background

In submittals dated October 14 and November 15, 1994, the licensee requested relief from the Section XI requirements of the Code regarding the repair or replacement of a leaking pipe at the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2). The subject pipe is made of stainless steel Type 304 material. The licensee stated its belief that the leak is caused by a manufacturing defect. The licensee further states that relief is necessary because performing a Code repair at this time would be impossible without shutting down the unit. A licensee may request relief under Section 50.55a(g)(5)(iii) of Title 10 of the Code of Federal Regulation if conformance to the Code would be impractical and result in undue hardship without a compensating increase in the level of quality and safety.

2.0 DISCUSSION

2.1 Section XI Requirement

The 1986 Edition of the Code is used at HBR2. Section XI, Articles IWA/IWD 4000 and IWA/IWD 7000 specify requirements for the repair or replacement of Code Class 3 pressure-retaining components with defects exceeding the acceptance standards of the Code, Section XI, Article IWA 3000.

2.2 Basis for Relief

The licensee requested relief in a October 14, 1994, letter to the NRC and stated:

On September 30, 1994, the plant staff identified that a section of CVCS Line 2-CH-151R-32 had through-wall pinhole leaks. This line is a 2 inch diameter, schedule 10 piping, located downstream of the Boric Acid Filter near valve CVC-348. A total of three separate leaks have been identified within a 3 square inch section of pipe. The leak rate with the line pressurized to its operating pressure of 105 psig is characterized by observation to be approximately 2 cubic centimeters per minute (i.e., 0.00053 gpm). Line 2-CH-151R-32 provides a flow path from the Boric Acid Transfer Pumps to the suction of the Charging Pumps or to the Volume Control Tank. This path is used to provide soluble boric acid for chemical reactor reactivity control. The Code repair involves replacement of the piping and would involve making the normal boric acid flow paths inoperable, and is currently estimated to require approximately 30 hours to complete. Plant Technical Specifications (TS) Section 3.2.2.d requires that CVCS "piping, instrumentation, controls, and valves shall be operable to the extent of establishing one flow path from the boric acid tanks and one flow path from the refueling water storage tank to the Reactor Coolant System." If this TS requirement cannot be met, TS Section 3.0 is entered and requires the plant be placed in hot shutdown within 8 hours of its entry and in cold shutdown within the next 30 hours. The Code repair (i.e., pipe replacement) cannot be accomplished without requiring a plant shutdown.

The licensee requested deferral of the Code-required repair or replacement until the next scheduled outage exceeding 30 days, but no later than the next refueling outage which is currently scheduled to begin in April 1995.

2.3 Proposed Alternative

The licensee states:

We request relief to perform a temporary non-Code repair which consists of a clamping device which compresses a seal material that is compatible with the pipe material and process fluid against the leak site. The integrity of the temporary non-Code repair will be monitored as described in Generic Letter (GL) 90-05 by a qualitative visual examination on a weekly basis. GL 90-05 also recommends either UT or radiographic testing on a three-month interval until the Code repair is completed; however we will not perform this examination, because of the possibility of damaging the pipe heat tracing, unless the visual examination indicates further degradation of the pipe.

During the period prior to a shutdown of sufficient duration, the licensee has proposed to implement the following alternate provisions as stated in the October 14, 1994, letter:

Four additional locations were observed with no leakage. Contrary to the guidance in GL 90-05 with respect to the examination of five other locations, only two of the four locations were examined by UT to determine if the flaws reflect a localized phenomenon or whether they

are indicative of a more pervasive problem. The results of these additional examinations show that the inspected locations are acceptable regarding minimum wall thickness requirements; and therefore, maintain adequate structural integrity. No additional inspections are planned at this time due to accessibility concerns due to the use of heat tracing on the pipe.

Plans for periodic reinspection were provided by the licensee in a supplemental letter dated November 15, 1994, in which the licensee states:

The affected pipe section will be visually inspected on a weekly basis. The insulation will be removed from the affected section on a monthly basis. We consider this inspection to be appropriate for the identified flaw since there is no reason to expect the leakage to accelerate. Since the pipe is heat traced, frequent removal of the insulation would present a small risk of damage to the heat tracing. For this reason, we are proposing to remove insulation and inspect the affected pipe section on a monthly rather than a weekly basis. Any significant leakage through the temporary repair would be seen on the insulation.

Additionally, the pipe is in an area which is entered during operator rounds on each shift. Any substantial increase in leakage from the piping would most likely be detected within a relatively short period of time (i.e., 12 hours maximum).

The licensee committed to the following course of action in the letter to the NRC dated October 14, 1994:

During the monitoring period, if the conditions of the pipe degrade further and structural integrity cannot be assured, an emergency replacement would be required. Since the flawed pipe section cannot be replaced without requiring a plant shutdown, a request for enforcement discretion would be submitted to the NRC prior to undertaking replacement or the plant would be shut down.

2.4 Significant Safety Issues

The licensee evaluated the flaws in this piping under the guidance of GL 90-05 and determined that the pipe is operable, i.e., capable of performing its safety function without any compensatory actions, limitations, or the need for alternate functional capability. The stresses were found to remain within Code allowables. The licensee evaluated the effects of flooding, spraying of water on equipment, and loss of flow in considering the use of a clamp. The licensee is installing the clamp because it is concerned with the potential effect of the leaking borated water on the pipe's heat tracing. The licensee is monitoring the heat tracing and can identify and correct any loss of heat trace function immediately.

3.0 EVALUATION

The NRC agrees that meeting the Code requirements in this case is impractical and would result in hardship without a compensating increase in the level of quality and safety. The licensee would have to shut down the plant to repair the piping in conformance with the Code.

The licensee performed actions that constitute an acceptable alternative to the Code requirements. It evaluated the flaws under the guidance of GL 90-05 and determined that the pipe is operable. It evaluated the effects of flooding, spraying of water on equipment, and loss of flow and found the temporary repair, consisting of a clamp, acceptable. It performed an augmented inspection of four additional locations, and these did not reveal evidence of leakage. The licensee intends to monitor the repair as described in GL 90-05. If the pipe degrades further, the licensee will perform an emergency repair, if necessary.

4.0 CONCLUSION

The NRC has determined that Code repair requirements in this case are impractical and would result in undue hardship without a compensating increase in the level of quality and safety. Furthermore, the licensee has evaluated the flaws in the piping under the guidance of GL 90-05. This evaluation will reasonably ensure structural integrity and protect the public health and safety. Under 10 CFR 50.55a(g)(6)(i), relief is granted until the next scheduled outage exceeding 30 days, but no later than the next scheduled refueling outage. The flawed pipe must then be repaired or replaced in accordance with the Code.

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