



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING RELIEF FROM EXAMINATION OF REACTOR COOLANT PUMPS

CONNECTICUT YANKEE ATOMIC POWER COMPANY

HADDAM NECK PLANT

DOCKET NO. 50-213

BACKGROUND

Section XI of the ASME Code requires examination of one reactor coolant pump during each ten-year interval of plant operation. By letters dated March 12 and June 26, 1984, Connecticut Yankee Atomic Power Company (CYAPCO) submitted requests for relief from the requirement for the Haddam Neck Plant and provided information in support of the requests. Pursuant to 10 CFR 50.55a(g)(6)(i), this information was evaluated to determine if the requirement is impractical to perform on the component and if relief from the requirements can be granted.

RELIEF REQUEST

Relief from performing volumetric examination of a reactor coolant pump is requested. Relief from performing visual inspection of a Reactor Coolant Pump internal surface is requested unless the pump is disassembled for maintenance or other reasons.

SECTION XI CODE REQUIREMENTS

- (1) Code Item No. B5.6, Category B-L-1 - Volumetric examination, to include 100% of pressure retaining welds of one pump in each group of pumps performing similar functions in a system. The examinations shall be performed during each inspection interval, and may be performed at or near the end of the inspection interval.

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- (2) Code Item No. B5.7, Category B-L-2 - Visual examination of the internal pressure boundary surfaces on one pump in each of the group of pumps performing similar functions in the system during each inspection interval. The examinations may be performed at or near the end of the inspection interval.

LICENSEE BASES FOR RELIEF REQUEST

Volumetric examination of the casing welds or visual examination of the internal casing surfaces requires complete disassembly of the reactor coolant pump casing internals and draining of the reactor coolant pump. Ultrasonic examination of the welds would produce questionable results because of the ultrasound attenuation characteristics of the casing material, therefore making radiography the only feasible method which could be utilized. However, the preparation work, relatively high radiation levels that would be encountered by personnel (estimated to be 30 ManRem for the work associated with the ISI examination only), the additional risk of pump component damage, the costs associated with accomplishing these additional steps, approximately \$300,000, and the probability of using an additional 3 days of critical path time at \$600,000 per day, make the requirements impractical and unjustifiable since the total cost for pump examination would be in excess of \$2,000,000.

ALTERNATE EXAMINATIONS PROPOSED BY LICENSEE

Alternate examinations to which CYAPCO has committed are:

- (1) to visually inspect the pump casing during performance of system pressure tests,
- (2) to perform a surface examination of the welds on the exterior of the pump and,
- (3) to perform a visual inspection of the pump internal surfaces welds if a reactor coolant pump is disassembled for other reasons.

STAFF EVALUATION AND CONCLUSION

Volumetric examination of the casing welds or visual examination of the internal casing surfaces requires complete disassembly and draining of the reactor coolant pump. Ultrasonic testing and radiography are the two techniques currently used to perform volumetric examinations of welds and surfaces. Ultrasonic examination of the welds would produce questionable results because of the ultrasound attenuation characteristics of the cast stainless steel casing material, thereby making radiography the only feasible method that could be used. However, the preparation work, relatively high radiation levels that would be encountered by personnel, risk of pump component damage and personnel safety makes volumetric examination by radiography impractical to perform. A number of radiography and visual examinations of pump casings have been performed at other plants with no evidence of cracks or surface degradation reported.

In lieu of the volumetric examination of the pump casing weld and visual inspection of the internal surfaces, the licensee has committed to perform a surface examination of the welds. In addition to the surface examination, a visual inspection of the casing exterior surface will be performed during the hydrostatic test of the reactor coolant system. In the event that the pump has to be disassembled for operational or maintenance purposes, the required visual inspection of the internal surfaces will be performed.

In consideration of the service experience cited above and the fact that defects in pump casings are most likely to be initiated from outer surfaces, the staff concludes that the alternative surface and visual examinations which will be performed on the pump welds and casing will provide adequate assurance that pump degradation has not occurred and that the plant can be operated safely. Therefore the requested relief from volumetric examination of the casing weld and visual inspection of the internal casing surfaces is granted. The relief thus granted 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 CYAPCO that could result if the requirements were imposed on the Haddam Neck Plant.

ACKNOWLEDGMENTS

This Safety Evaluation was prepared by G. Johnson.

Dated: June 10, 1985.