



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

WISCONSIN ELECTRIC POWER COMPANY
POINT BEACH NUCLEAR PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-266 AND 50-301

REQUESTS FOR RELIEF FROM ASME CODE SECTION XI EVALUATION REQUIREMENTS

I. BACKGROUND

In a letter dated January 25, 1988, as supplemented by letter dated May 31, 1988, Wisconsin Electric Power Company (the licensee) requested relief from the examination requirements of the 1977 Edition through Summer 1979 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code to conduct Category B-L-1 and B-L-2 examinations on the Units 1 and 2 reactor coolant pump casings. The licensee provided information in support of its determination that the code requirements were impractical to perform, and proposed an alternative to the code requirements. In accordance with 10 CFR 50.55a(g)(6)(i), the staff has evaluated the licensee's determinations and proposed alternative examinations. The relief requests, the code requirements, the licensee's determinations, and our bases for granting the reliefs are contained herein.

II. RELIEF REQUESTS AND SUPPORTING INFORMATION

A. Relief Request RR-1-13 and RR-2-13

- relief from performing a volumetric examination of reactor coolant pump casings.
- relief from performing a visual examination of the reactor coolant pump interior pressure boundary surfaces.

B. Exam Area

Three circumferential pressure-retaining welds on the reactor coolant pump casing.

C. ASME Section XI Category Number and Examination Requirement

B-L-1: "The examinations performed during each inspection interval shall include 100% of the pressure-retaining welds in at least one pump in each group of pumps performing similar functions in system (e.g. recirculating coolant pumps)." The exam method shall be volumetric.

B-L-2: "One pump in each of the group of pumps performing similar functions in the system shall be examined during each inspection interval. This examination may be performed on the same pump selected for the category B-L-1 examination." The exam method shall be visual.

D. Alternative Examinations Proposed by Licensee

- (a) A visual (VT-2) examination of the casing exterior will be performed in conjunction with the system leakage test every outage and each system hydrostatic test.
- (b) If maintenance or operational problems are encountered which necessitate disassembly of the casing internals of either pump, a VT-1 examination of the interior casing surface will be performed. If a pump is not disassembled, this commitment will extend to the next inspection interval.
- (c) If a pump is disassembled to the extent that a radiographic examination is practical and a miniature linear accelerator (MINAC) is available, the code-required volumetric examination will be performed.
- (d) Once each interval, an exterior surface examination of approximately one-third of the accessible pump casing weld surface will be conducted in conjunction with a 100% exterior visual examination (VT-1). If the code-required examination is performed as discussed in Item (c) above, this examination is not necessary.

Furthermore, the licensee stated that vibration monitors are currently installed on the motor frame near the lower radial bearing and on the motor shaft above each pump casing. These monitors will alarm on panel C04 in the control room if either detects high vibration. The PBNF Operating Procedures Manual provides reactor coolant pump (RCP) vibration limits. If the limits are exceeded, the licensee would expect to shut down the RCP's and determine the cause. These monitors would most likely detect any problem which could lead to pump casing, welds, or rotating element failure.

(e) Licensee's Reason for Limitation

The two reactor coolant pumps (RCP) at each Point Beach unit are Westinghouse Model 93 pumps. Each pump casing is fabricated by welding four stainless steel (SA351 CF8) castings together. Thus, there are three circumferential pressure-retaining welds that are to be volumetrically inspected in accordance with Category B-L-1. Because the physical properties of the stainless steel castings and weld material prevent meaningful ultrasonic examination, the casing welds must be inspected using the miniature linear accelerator (MINAC).

To date, the licensee has not attempted any ultrasonic examinations of the reactor coolant pump casing welds. They believe that ultrasonic testing of the welds is impractical based on both their past experience with UT on other stainless steel castings and on past industry experience. However, because the NRC staff considers the impracticality of ultrasonic testing to be plant-specific, the licensee will attempt ultrasonic testing on one weld of a Unit 1 reactor coolant

pump during the spring 1989 refueling outage. Should it prove to be a practical method for volumetric examination of the casing welds, the licensee would propose to complete the ASME Section XI category B-L-1 examination using the ultrasonic method on both Unit 1 and Unit 2. However, in that testing may very well demonstrate that ultrasonic testing will be impractical, the licensee requested that these relief requests be approved.

This radiographic examination is performed by placing the MINAC inside the pump casing and placing the film on the outside of the pump. To perform the examination, the pumps must be completely disassembled. Disassembly to this extent is far beyond any disassembly expected except for this examination. Also, insulation on the casing exterior must be removed for film placement. Additionally, the pump bowl must be dry for installation of the MINAC. Therefore, all fuel assemblies must be removed from the reactor vessel, and reactor vessel water level lowered to below the vessel nozzles. Complete disassembly of the pump is also required to conduct the VT-1 examination in accordance with Category B-L-2.

This radiographic examination using the MINAC was performed on Point Beach Unit 1 "B" RCP during the fall 1981 refueling outage. In addition, the same examination has been performed at several other sites. No problems have been found with the welds at any site. Additionally, no problems have been found during the Category B-L-2 visual examination. This examination was conducted at PBNP by using the video camera on the MINAC.

The licensee believes that performing a volumetric examination of the Point Beach reactor coolant pump casing welds and a visual examination of the interior pressure retaining surface of one pump per unit during the second 10-year inspection period does not provide an increase in safety commensurate with the associated cost potential for inadvertent pump damage and expected radiation exposure. The following items have been considered by the licensee:

1. Radiation Levels

Currently the average dose rates at the RCP are:

8' elevation general area	< 1 - 25 mR/hr
Below RCP	10 - 800 mR/hr
in RCP	700 - 10,000 mR/hr

2. Total Estimated Exposure During the Examination

The whole body doses received during the fall 1981 examination of Unit 1, RCP-B are listed below. This list does not include the additional dose received while getting the plant to a condition where RCP disassembly could be performed (e.g., complete core unload).

- PBNP maintenance personnel during disassembly	5,237 mR
- Contractor personnel - diffuser adapter removal	3,890 mR
- Contractor examination personnel	12,626 mR
- Contractor personnel - insulation removal/replacement	4,490 mR
- Contractor personnel - diffuser adapter replacement	1,833 mR
- PBNP Maintenance personnel - reassembly	6,017 mR
TOTAL	34,093 mR

3. Pump Disassembly

The Category B-L-1 and B-L-2 examinations require complete disassembly of the pump. The pump manufacturer (Westinghouse) does not require or recommend pump disassembly to perform normal maintenance or inspections. The only time disassembly to this degree has ever occurred was to perform this examination during the fall of 1981. Therefore, very limited experience in this area may result in significant damage or degradation to the pump. Additionally, complete pump disassembly is not anticipated for any other reason in the foreseeable future.

4. Pump Performance

The type of material used in these pumps is widely used throughout the industry and has performed very well. There have been no reported problems or failures with the casing welds of these model pumps. Additionally, the licensee has had no operational problems with the RCP's which could indicate potential degradation of the casing welds.

5. Excessive Cost

The estimated cost to disassemble/reassemble the pump, remove and reinstall insulation and to perform the examination is approximately \$810,000. Additionally, this examination is expected to extend the refueling outage a minimum of 5 days. Therefore, replacement power costs would be a minimum of about \$1.5 million. Any minor problems which might occur could significantly increase the cost of the examination.

III. STAFF EVALUATION AND CONCLUSION

Based on the pumps' design, materials of construction, and internal inaccessibility, the staff finds the Code requirements to be impractical to perform. The licensee's proposed alternate examinations will provide a high degree of certainty of the pumps' structural integrity. The staff concludes that relief from the volumetric examination of the pumps' casing welds and visual examination of the internal surfaces should be granted provided the proposed alternative examinations are substituted.

Based on the review summarized, the staff concludes that the relief granted from the examination requirements and the alternate methods imposed through this document give reasonable assurance of the component pressure boundary and support structural integrity. Pursuant to 10 CFR 50.55a(g)(6)(i), and based on the alternatives discussed above, the staff finds that the relief requested is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest considering the burden that could result if it were imposed on the facility.

Date:

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