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May 31, 1988

U. S. NUCLEAR REGULATORY COMMISSION
Document Control Desk
Mail Station Pl-137
Washington, D.C. 20555

Attention: Mr. David Wagner, Project Manager
Project Directorate III-3

Gentlemen:

DOCKETS 50-266 and 50-301
ASME SECTION XI, RELIEF REQUESTS
POINT BEACH NUCLEAR PLANT, UNITS 1 and 2

In a letter to the NRC dated January 25, 1988, Wisconsin Electric Power Company requested an inservice inspection relief for the second ten-year inspection interval for the Point Beach Nuclear Plant, Units 1 and 2. The request was for relief from the requirement to conduct Category B-L-1 and B-L-2 examinations on one Unit 1 and one Unit 2 reactor coolant pump casing.

In a response to Wisconsin Electric dated April 14, 1988, the NRC staff indicated our proposed alternative examinations would be generally acceptable and suggested several additions regarding the alternative examinations. We have reviewed the suggestions from your April 14, 1988 letter and agree to revise our proposed alternative examinations as follows:

- (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.

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

Your letter also asked us to describe any previous attempts to perform ultrasonic testing on the reactor coolant pump casing welds at Point Beach. To date, we have not attempted any ultrasonic examinations of the reactor coolant pump casing welds. We believe that ultrasonic testing of the welds is impractical. This is based both on our 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 we 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, we 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 our testing may very well demonstrate that ultrasonic testing will be impractical, we request that the attached relief requests be approved.

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We believe that these revised relief requests enclosed herewith address your concerns. If you have any further questions, please contact us.

Very truly yours,



C. W. Fay
Vice President
Nuclear Power

Enclosures

Copy to NRC Regional Administrator, Region III
NRC Resident Inspector



ATTACHMENT 1

UNIT 1 RELIEF REQUEST

Relief Request No. RR-1-13 (Revision 1)

Description: Reactor Coolant Pump Casing Welds



ATTACHMENT 1

Component

Reactor Coolant Pump

Exam Area

Class 1 Casing Welds

Isometric or Component Drawing

See Attachments 3 and 4

ASME Section XI Category

B-L-1

B-L-2

ASME Section XI Item Number

B12.10

B12.20

ASME Section XI 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.

Alternative Examination

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.

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.

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.

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 above, this examination is not necessary.

Reason for Relief Request

The two reactor coolant pumps (RCP) for Point Beach Unit 1 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).

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 the vessel water level lowered to below the 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 visual examination was conducted at PBNP by using the video camera on the MINAC.

We believe that performing a volumetric examination of the Point Beach Unit 1 reactor coolant pump casing welds and a visual examination of the interior pressure retaining surface of one pump during the second ten-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:

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 adaptor 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 RCPs 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.

6. Alternative Examinations

The alternative examinations we are proposing, as well as the already installed vibration monitoring system, will be sufficient to detect any problems which may occur.

- (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 radiograph 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.
- (e) Vibration monitors are currently installed on the motor frame near the lower radial bearing and on the motor shaft above the pump casing. These monitors will alarm on panel CO4 in the control room if either detects high vibration. The PBNP Operating Procedures Manual provides reactor coolant pump vibration limits. If the limits are exceeded, we would expect to shut down and determine the cause. These monitors would most likely detect any problem which could lead to pump casing, welds, or rotating element failure.

In conclusion, we believe that, based on the preceding items, performing the volumetric inspection of the RCP casing welds and the visual examination of the internal surface of the pump casing during the second ten-year interval do not provide a commensurate increase in safety. We, therefore, request approval of this relief request.



ATTACHMENT 2

UNIT 2 RELIEF REQUEST

Relief Request No. RR-2-13 (Revision 1)

Description: Reactor Coolant Pump Casing Welds



ATTACHMENT 2

Component

Reactor Coolant Pump

Exam Area

Class 1 Casing Welds

Isometric or Component Drawing

See Attachment

ASME Section XI Category

B-L-1
B-L-2

ASME Section XI Item Number

B12.10
B12.20

ASME Section XI 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.

Alternative Examination

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.

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.

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.

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 above, this examination is not necessary.

Reason for Relief Request

The two reactor coolant pumps (RCP) for Point Beach Unit 2 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).

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 the vessel water level lowered to below the 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 visual examination was conducted at PBNP by using the video camera on the MINAC.

We believe that performing a volumetric examination of the Point Beach Unit 2 reactor coolant pump casing welds and a visual examination of the interior pressure retaining surface of one pump during the second ten-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:

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 |
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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).

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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 RCPs 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.

6. Alternative Examinations

The alternative examinations we are proposing, as well as the already installed vibration monitoring system, will be sufficient to detect any problems which may occur.

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In conclusion, we believe that, based on the preceding items, performing the volumetric inspection of the RCP casing welds and the visual examination of the internal surface of the pump casing during the second ten-year interval do not provide a commensurate increase in safety. We, therefore, request approval of this relief request.

