February 27, 2003

Mr. Fred J. Cayia
Site Vice President
Point Beach Nuclear Plant
Nuclear Management Company, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2 - ISSUANCE OF RELIEF REQUEST NO. 10 ALTERNATIVE TO EXAMINE ALL THREE VESSELS OF THE REGENERATIVE HEAT EXCHANGER (TAC NOS. MB5401 AND MB5402)

Dear Mr. Cayia:

By letter dated March 22, 2002, as supplemented by letters dated August 15 and September 4, 2002, the Nuclear Management Company, LLC, submitted Relief Request No. 10 for the Point Beach Nuclear Plant, Units 1 and 2, requesting an alternative to the requirement to examine all three vessels of the regenerative heat exchanger, thus allowing for one of the vessels to be examined as opposed to all three.

The Nuclear Regulatory Commission staff has determined that the proposed request for relief is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative provides an acceptable level of quality and safety. The duration of the authorized alternative is for the fourth interval inservice inspection program.

A copy of our related safety evaluation is also enclosed.

Sincerely,

/RA/

L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-266 and 50-301

Enclosure: Safety Evaluation

cc w/encl: See next page

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DISTRIBUTION:

PUBLIC	OGC	ACRS
PDIII-1 Reading	SCoffin	DSpaulding
LRaghavan	RBouling	TMcLellan
DSpaulding	GHill(4)	KRiemer, RGN-III

**No legal objection
*Provided SE input by memo

ADAMS Accession No. ML030210126

OFFICE	PDIII-1/PM	PDIII-1/LA	EMCB/SC*	OGC**	PDIII-1/SC
NAME	DSpaulding	RBouling	SCoffin	RHoefling	LRaghavan
DATE	02/25/03	02/24/03	09/19/02	01/28/03	02/27/03

OFFICIAL RECORD COPY

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO FACILITY OPERATING LICENSE NO. DPR-24

AND TO FACILITY OPERATING LICENSE NO. DPR-27

NUCLEAR MANAGEMENT COMPANY, LLC

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-266 AND 50-301

1.0 INTRODUCTION

By letter dated March 22, 2002, as supplemented by letters dated August 15, and September 4, 2002, the Nuclear Management Company, LLC (the licensee), submitted Relief Request No. 10 which proposed an alternative to the requirements to examine all three vessels of the regenerative heat exchanger. The relief request would allow the licensee to only examine one of the three vessels.

2.0 REGULATORY EVALUATION

Inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (the Code) Class 1, 2, and 3 components is to be performed in accordance with ASME code Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(i). It is stated in 10 CFR 50.55a(a)(3) that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if the applicant demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the Point Beach Nuclear Plant, Units 1 and 2, fourth 10-year ISI interval is the 1998 Edition through the 2000 Addenda of the ASME Code.

3.0 TECHNICAL EVALUATION

The following technical evaluation pertains to the Relief Request No. 10.

Code Requirement:
The 1998 Edition through the 2000 Addenda of the ASME *Boiler and Pressure Vessel Code*, Section XI:

Table IWB-2500-1, Examination Category B-B, Items B2.51 and B2.80, Examination Category B-D, Items B3.150 and 3.160 requires a 100 percent volumetric examination;

Table IWC-2500-1, Examination Category C-A, Items C1.20 and C1.30 requires a 100 percent volumetric examination;

Table IWC-2500-1, Examination Category C-B, Item C2.21 requires a 100 percent volumetric examination and a 100 percent surface examination.

Component Identification:
Regenerative Heat Exchangers 1HX-2 and 2HX-2 Welds

Examination Category B-B, Item No. B2.51, circumferential head weld, volumetric examinations

Unit 1	Unit 2
RHE-01	RHE-01
RHE-05	RHE-05
RHE-09	RHE-09

Examination Category B-B, Item No. B2.80, tubesheet to shell weld, volumetric examinations

Unit 1	Unit 2
RHE-02	RHE-02
RHE-06	RHE-06
RHE-10	RHE-10

Examination Category B-D, Item No. B3.150, nozzle to vessel weld, volumetric examinations

Unit 1	Unit 2
RHE-N1	RHE-N1
RHE-N4	RHE-N4
RHE-N5	RHE-N5
RHE-N8	RHE-N8
RHE-N9	RHE-N9
RHE-N12	RHE-N12

Examination Category B-D, Item No. B3.160, nozzle inner radius section, volumetric examinations

Unit 1	Unit 2
RHE-N1-IRS	RHE-N1-IRS
RHE-N4-IRS	RHE-N4-IRS
RHE-N5-IRS	RHE-N5-IRS
RHE-N8-IRS	RHE-N8-IRS
RHE-N9IRS	RHE-N9IRS
RHE-N12-IRS	RHE-N12-IRS

Examination Category C-A, Item No. C1.20, tubesheet to shell weld, volumetric examinations

Unit 1	Unit 2
RHE-04	RHE-04
RHE-08	RHE-08
RHE-12	RHE-12

Examination Category C-A, Item No. C1.30, tubesheet to shell weld, volumetric examinations

Unit 1	Unit 2
RHE-03	RHE-03
RHE-07	RHE-07
RHE-11	RHE-11

Examination Category C-B, Item No. C2.21, tubesheet to shell weld, surface and volumetric examinations

Unit 1	Unit 2
RHE-N2	RHE-N2
RHE-N3	RHE-N3
RHE-N6	RHE-N6
RHE-N7	RHE-N7
RHE-N10	RHE-N10
RHE-N11	RHE-N11

Licensee's Code Relief Request: (As stated)
Pursuant to 10 CFR 50.55a(a)(3)(ii), Point Beach Nuclear Plant (PBNP) requests an alternative to the Code requirement for scheduling of components for examination as specified in the 1998 Edition of ASME Section XI with Addenda through 2000. To perform the examinations as required would result in excessive radiation dose accumulation and is a hardship.

Licensee's Basis for Requesting Relief: (As stated)
The regenerative heat exchanger is a high radiation component, located inside of a lock [sic] high radiation area. It is the greatest single source of radiation exposure accumulated during a normal refueling outage for ISI and support personnel. Just as an outage begins, radiation protection personnel make a survey of the area to document dose rates. These rates are typically 700 mr [millirem] to 1400 mr for the general area. Hot spots of 3000 mr are normally found on contact with the heat exchanger. The following dose accumulations are expected using 3.0 rem-hour due to the close contact the workers and nondestructive examination (NDE) examination personnel experience in the course of performing their duties for each weld:

0.2 Man-hours for insulation removal	= 0.6 Man-Rem
0.2 Man-hours for weld cleaning and preparation	= 0.6 Man-Rem
0.75 Man-hours for conducting examinations	= 1.5 Man-Rem
0.75 Man hours second examiner (700 mr dose area)	= 0.525 Man-Rem
0.5 Man-hours for insulation replacement	= 1.5 Man-Rem

Total = 4.725 Man-Rem

By eliminating 23 of the required vessel examinations, a total reduction in excess of 100 man-rem can be realized. While it is recognized this dose accumulation is probably a high estimate, it is obvious a significant reduction in dose accumulation will occur.

As part of the as low as reasonably achievable program, shielding is placed over non-examination areas. The general dose rates are reduced by approximately 50 percent. However, the highest dose rates are encountered during the examinations. The benefit the examiner receives from the shielding is minimal.

Early examinations of these welds show there are significant restrictions to meeting full Code compliance. In some cases, only 25 percent of the examination area was achieved.

The examination of the lowest vessel of the regenerative heat exchanger will satisfy the IWB-1220(a) and IWC-1220(a) requirements to perform examinations on the same welds as was examined previously. The welds on this vessel were examined during the third interval in accordance with the previously approved relief requests, RR-1-12 and RR-2-12.

At the beginning of an outage, operations personnel walk down the containment with procedure PC-24, containment inspection checklist. This checklist requires entry into the regenerative heat exchanger cubicle to look for leakage from valves. Since the heat exchanger and valves are in close proximity to each other and operations personnel are trained to look for leakage, any leakage would be noticed. System engineers also perform an entry into this area to look over their systems. There is also a walk down performed by NDE personnel to look for leakage anywhere in containment.

The consequences of a weld failure of one of the regenerative heat exchanger welds has been addressed in the plant's final safety analysis report. To evaluate chemical and volume control system (CVCS) safety, failures or malfunctions were assumed to be concurrent with a loss-of-coolant accident (LOCA) and the consequences analyzed. A LOCA and a concurrent regenerative heat exchanger weld failure is included in the more general category of a rupture in the CVCS line inside containment. During such an occurrence, the remote-operated valve located near the main coolant loop, upstream of the regenerative heat exchanger, is closed on low pressurizer level to prevent supplementary loss of coolant through the letdown line. The regenerative heat exchanger would eventually be isolated, with leakage being confined to the containment, in the case of a weld failure without a LOCA.

The bottom heat exchanger welds are the logical ones to be examined. The bottom heat exchanger operates at the highest temperature of the three and is the most highly stressed. Typical operating temperatures for letdown flow are 538 degrees into the bottom shell and 252 degrees out the top shell. The bottom heat exchange [sic] welds can generally be more extensively examined than the other heat exchanger welds due to ease of access. This was documented and was found during a review of previous examination data.

By implementing the proposed alternatives, the intent of the Code requirements are being met. The welds on the most severely stressed vessel are being volumetrically examined. With the combination of the Section XI volumetric examinations and leakage tests, the system engineer walkdowns, and the walkdown of the containment by operations and NDE personnel looking for areas where leakage occurred, the alternative examinations will provide an acceptable level of quality and safety.

Licensee's Proposed Alternative Examination: (As stated)
PBNP proposes to examine one of the three vessels comprising the regenerative heat exchanger component. The [sic] will be the bottom vessel of the three. The accessible portions of the circumferential, head welds, tubesheet to shell welds, nozzle to shell

welds, and nozzle inside radius sections on one of the identical vessels will be examined to the extent practical. The vessel selected for examination is the same as for the previous interval.

NRC Staff Evaluation:

The licensee's submittal did not provide an adequate basis for the staff to review the relief request pursuant to 10 CFR 50.55a(a)(3)(ii). However an adequate basis was provided for the NRC staff to review the relief request pursuant to 10 CFR 50.55a(a)(3)(i).

The ASME Code, Section XI, Table IWB-2500-1, Examination Category B-B, Items B2.51 and B2.80, Examination Category B-D, Items B3.150, and 3.160, Table IWC-2500-1, Examination Category C-A, Items C1.20 and C1.30, Examination Category C-B, Item C2.21, requires 100 percent volumetric examination. In addition, for Examination Category C-B, Item C2.21, the Code requires a 100-percent surface examination.

To reduce the overall radiation dose associated with the examination of the regenerative heat exchanger welds in each interval (estimated at 100 man-rem for the examining of the subject welds), the licensee has proposed, as an alternative, to perform the Code required examinations on the lower of the three vessels in the regenerative heat exchanger assembly, and that the accessible portions of the circumferential head welds, tubesheet to shell welds, nozzle to vessel welds, and nozzle inside radius sections on one of the identical vessels will be examined to the extent practical.

The lower regenerative heat exchanger should be the representative of the general state of the assembly. It is subject to the most severe operating conditions, operates at the highest temperature of the three vessels, and is the most highly stressed. Furthermore, the bottom heat exchanger welds can generally be more extensively examined than the other heat exchanger welds due to ease of access. The NRC staff determined that the proposed volumetric and surface (where required) examinations of the subject welds in the lower vessel of the regenerative heat exchanger assembly should detect a pattern of degradation, if present. In addition, the licensee will be performing Code required VT-2 visual examinations during system leakage tests. Therefore, the licensee's proposed alternative provides a reasonable assurance of quality and safety.

The NRC staff concludes that the licensee's proposed alternative provides a reasonable assurance of quality and safety. Therefore, the licensee's proposed alternative is acceptable pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI interval. This alternative does not preclude the 10 CFR 50.55a(g)(5)(iii) requirement to submit a request for relief for the subject welds, if the licensee finds it impractical to obtain an examination coverage of essentially 100 percent as defined in Code Case N-460 *Alternative Examination Coverage for Class 1 and 2 Welds, Section XI, Division 1*. Code Case N-460 is approved for general use in Regulatory Guide 1.147 *Inservice Inspection Code Case Acceptability*, ASME Section XI, Division 1, Revision 12.

The NRC staff authorizes an alternative to the requirement to examine all three vessels of the regenerative heat exchanger, thus allowing for one of the vessels to be examined as opposed to all three. The alternative provides an acceptable level of quality and safety. The duration of the authorized alternative is for the fourth interval ISI program.

4.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the relief request will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: T. McLellan

Date: February 27, 2003

Point Beach Nuclear Plant, Units 1 and 2

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