NMC
Committed to Nuclear Excellence

Point Beach Nuclear Plant
Operated by Nuclear Management Company, LLC

January 7, 2005

NRC 2005-0005
10 CFR 54

U.S. Nuclear Regulatory Commission
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Washington, DC 20555

Point Beach Nuclear Plant, Units 1 and 2
Dockets 50-266 and 50-301
License Nos. DPR-24 and DPR-27

Response to Request for Additional Information
Regarding the Point Beach Nuclear Plant License Renewal Application
(TAC Nos. MC2099 and MC2100)

By letter dated February 25, 2004, Nuclear Management Company, LLC (NMC), submitted the Point Beach Nuclear Plant (PBNP) Units 1 and 2 License Renewal Application (LRA). On November 18, 2004, the Nuclear Regulatory Commission (NRC) requested additional information regarding Auxiliary Systems and Time-Limited Aging Analyses (TLAA) (Sections 3.3 and 4.3.13 of the LRA). The enclosure to this letter contains NMC's response to the staff's questions.

On December 1, 2005, the NRC staff verbally provided additional time for NMC to respond to this request for additional information in order for further clarifications to be provided. The clarifications allowed for the NRC staff and the PBNP License Renewal project staff to clearly understand the information needed.

Should you have any questions concerning this submittal, please contact Mr. James E. Knorr at (920) 755-6863.

This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the forgoing is true and correct. Executed on January 7, 2005.

Dennis L. Koehl
Site Vice-President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosure

A093

cc: Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC
PSCW

ENCLOSURE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2 LICENSE RENEWAL APPLICATION

The following information is provided in response to the Nuclear Regulatory Commission (NRC) staff's request for additional information (RAI) regarding the Point Beach Nuclear Plant (PBNP) License Renewal Application (LRA).

The NRC staff's questions are restated below, with the Nuclear Management Company (NMC) response following.

Section 3.3 - Aging Management of Auxiliary Systems

NRC Question RAI 3.3-1:

In LRA Tables 3.3.2-3, 3.3.2-7, and 3.3.2-9, heat exchangers and heater/coolers with heat transfer as the intended function are identified with only internal environments and associated aging effects. The external environment is listed as N/A. The applicant is requested to explain why the external environment and associated aging effects are not identified for these components. The applicant is also requested to address the similar question for the heat exchangers and heater/coolers in Tables 3.3.2-2, 3.3.2-3, 3.3.2-4, 3.3.2-5, 3.3.2-7, and 3.3.2-9 which have a pressure boundary as their intended function.

NMC Response:

Due to the way the license renewal database was developed and used, tubing assets were identified as two separate components (i.e., tubing inside diameter (ID) and tubing outside diameter (OD)). This allowed selection of an internal environment for each (i.e., ID and OD), but since the database required each component to have both an internal and external environment, the external environment was documented as "N/A." This was done to keep the internal and external environments somewhat standard (see PBNP LRA Table 3.0-1, "Internal Service Environments," and Table 3.0-2, "External Service Environments"). Note that in Tables 3.3.2-3, 3.3.2-7, and 3.3.2-9, a Heat Exchanger (HX) material type is found with two or more different internal environments due to multiple referenced HXs, which is reflective of the different environments for the ID and OD of the tubing.

The only components in the subject HXs that have a "heat transfer" intended function are the tubes. External environments ("Indoor-No Air Conditioning," "Outdoor," etc.) would only apply to the shell of the HX, and since the shell only has a pressure boundary function, it (the shell) and its external environment are not identified under the "heat transfer" intended function. Additionally, the shell is typically made of a different material than the tubes, and therefore would not be represented by the same line item as the tubing in the LRA. Note 8 was used for each line item in the 3.x.2 tables of the LRA where this external environment of "N/A" was used for the "heat transfer" intended function.

This same methodology was used for heat exchangers and heater/coolers that have "pressure boundary" intended functions, which produces similar results in Tables 3.3.2-2, 3.3.2-3, 3.3.2-4, 3.3.2-5, 3.3.2-7, and 3.3.2-9. Note 8 was also used for each line item in the 3.x.2 tables in the LRA where this external environment of "N/A" was used for the "Pressure Boundary" intended function.

NRC Question RAI 3.3-2:

LRA Table 3.3.2-7 identifies no aging effects for neoprene expansion joints with an internal environment of air and wetted gas less than 140°F. Also, LRA Table 3.3.2-13 identifies the aging effects change in material properties and cracking for neoprene expansion joints with an internal environment of indoor with no air condition but does not identify an aging management program for these aging effects. For similar neoprene components in a warm, moist environments, the GALL report identifies the aging effects hardening and loss of strength and recommends a plant specific AMP to manage these aging effects. The applicant is requested to provide justification why no aging effects were identified for the internals of the expansion joints in Table 3.3.2-7 and why no aging management program is identified to manage the aging effects for the expansion joints in Table 3.3.2-13.

NMC Response:

Note that both Table 3.3.2-7 and 3.3.2-13 refer to external environments of "Indoor and No Air Conditioning" with no aging management required.

In accordance with the EPRI Report 1002950, "Aging Effects for Structures and Structural Components (Structural Tools)," Revision 1, August 2003, no aging effects exist for this material in these environments (less than 95°F). This is substantiated by PBNP plant-specific Operating Experience (OE). Note 16 was used to explain this 95°F threshold in LRA Tables 3.3.2.7 and 3.3.2-13. Note 16 states that elastomer components (e.g., neoprene, rubber, etc.) are indoors and not subject to ultraviolet (UV) or ozone, nor are they in locations that are subject to radiation exposure. These locations are also not subject to temperatures where change in material properties or cracking could occur (i.e., greater than 95°F).

Although the environment definition implies that temperatures may reach 140°F, the actual individual environments for these specific components were reviewed, and they do not exceed the 95°F threshold temperature. As a result, it was determined that these criteria are not exceeded in these instances, and therefore no aging management is required.

NRC Question RAI 3.3-3:

LRA Table 3.3.2-14 identifies the loss of material as an aging effect for carbon steel piping and fittings, and valve bodies in a raw water drainage environment. The applicant identifies the One-Time Inspection Program, LRA Section B2.1.13, to manage this aging effect. NUREG-1801, XI.M32 recommends one-time inspections as an appropriate aging management program where either an aging effect is not expected to occur but there is insufficient data to completely rule it out, or an aging effect is expected to progress very slowly. In cases where an aging effect is likely to occur, NUREG-1801 recommends periodic inspections. The staff does not consider a one-time inspection appropriate to manage the loss of material for carbon steel components in a raw water environment. The applicant is requested to justify use of a one-time inspection program to manage the loss of material for carbon steel components in a raw water environment.

NMC Response:

The components in question are drainage and sump pump discharge piping and valves as shown on drawing LR-M-223, Sheet 3, location G-8. The internal environment is referred to as "Raw Water – Drainage," which typically consists of groundwater from the facade sumps. Groundwater at PBNP is a non-aggressive environment (see LRA Table 3.5.0-1, responses to items 12 and 13). As this is a non-aggressive environment, any aging effects would be expected to proceed very slowly. Plant operating experience over 34 years of operation has not identified leakage from these lines. Based on the non-aggressive environment and plant specific operating experience, the use of one-time inspections to manage this aging effect is considered acceptable. A one-time inspection will provide ample indication of the condition of these components prior to the period of extended operation. Note that the One-Time Inspection Program provides the option to change to periodic inspections or provide for repairs based on the results of the condition assessment after the one-time inspection.

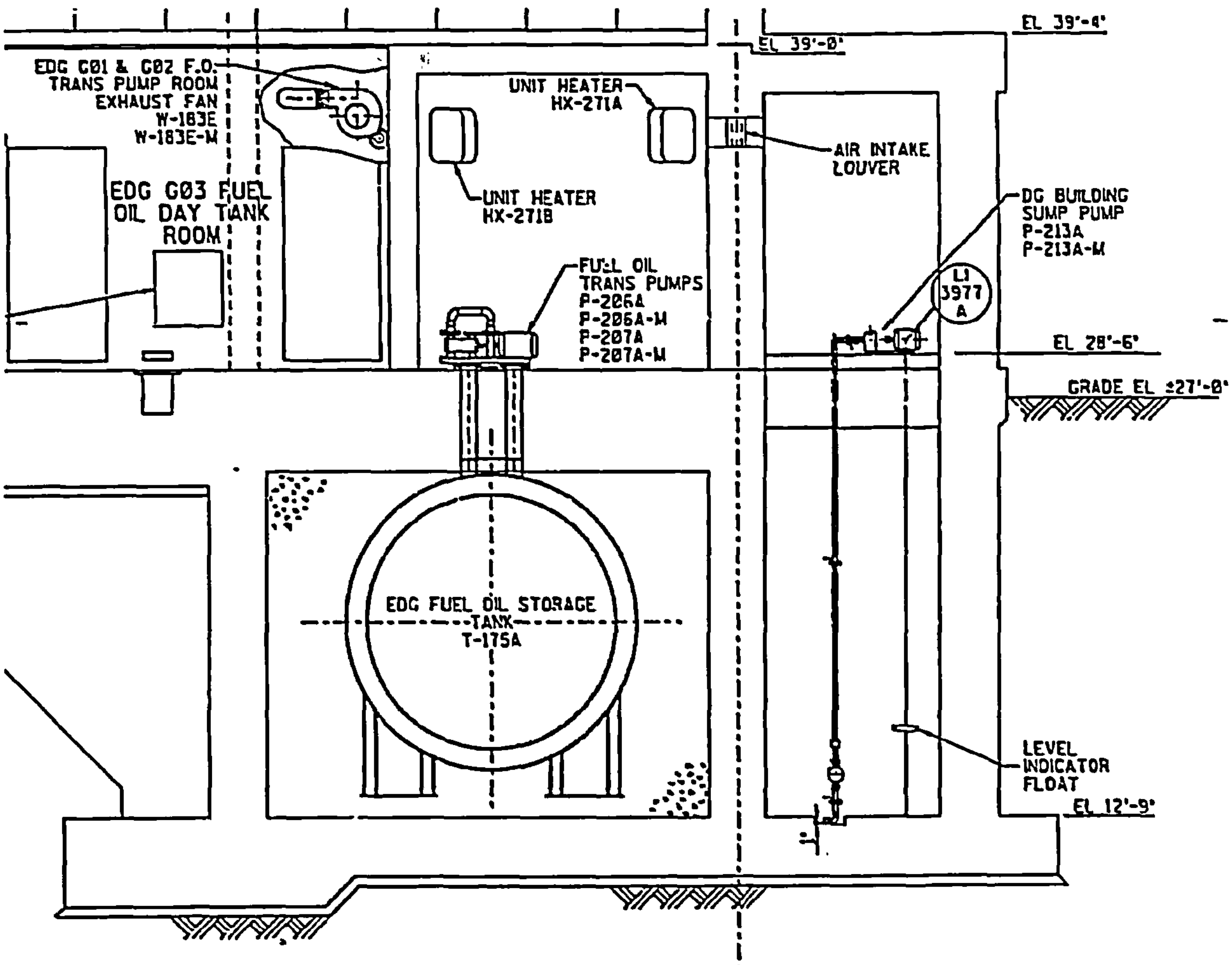
NRC Question RAI 3.3-4:

LRA Table 3.3.2-7 identifies no aging effects for carbon and low alloy steel tanks in a concrete environment. Staff notes that concrete has a high pH which is a natural inhibitor for steel; however, concrete contaminated with chlorides or concrete in contact with acidic water is subject to loss of material due to general, pitting, and crevice corrosion. The applicant is requested to describe the basis for concluding that no aging effects occur in this environment. Also state the specific tanks, the location of the tanks including the external environment, describe how the concrete interfaces with the tanks, and discuss if chlorides or acidic water can be present in this environment.

NMC Response:

The tanks referenced in LRA Table 3.3.2-7 are the fuel oil storage tanks, T-175A & B (reference drawings LR-M-219 Sheets 2 and 3). These tanks were installed via a modification to add two additional diesel generators in 1995. The 35,000 gallon carbon steel tanks were installed in a below-grade vault that was backfilled with concrete and are part of the diesel building structure, (shown on the next page). The arrangement for T-175B is similar to that for T-175A. The concrete-filled vault is not expected to experience groundwater infiltration. The ground and lake water have been analyzed for pH, chlorides, and sulfates and have been determined to be non-aggressive.

The tanks are provided with a secondary containment leak detection system. The tanks were covered with a high density polyethylene (HDPE) membrane system (40 mil thickness) manufactured by Gundle Lining Systems, Inc. of Houston, Texas. The membrane was applied to the tanks before the tanks were set in place and the backfill of concrete was completed. Because of the membrane/liner, the concrete is not in direct contact with the steel; therefore, chloride contamination is not expected. Associated with the membrane/liner are a collection box and piping routed to the building's collection/leakage detection system as shown on LRA drawing LR-M-219, Sheet 2. The tank membrane/liners are monitored weekly by plant procedure for oil and/or water effluent to the building sump. The carbon steel tanks are not subject to chlorides or acidic water and therefore have no aging effects requiring aging management.



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NRC Question RAI 3.3-5:

LRA Tables 3.3.2-7 and 3.3.2-9 identify the Periodic Surveillance and Preventive Maintenance (PSPM) Program to manage the loss of heat transfer due to fouling for heat exchangers in oil, fuel oil, outdoor, and wetted air and gas environments. The monitoring and trending element in the applicant's PSPM states that inspections, examination, testing, and component replacement activities are performed on a specified frequency based on operating experience or other requirements. The applicant stated that the results of these surveillance and preventive maintenance activities are documented, and subject to review and approval. NUREG-1800, Section A.1.2.3.5 recommends that monitoring and trending activities be described, and they should provide predictability of the extent of degradation and thus effect timely corrective actions. Plant specific and/or industry operating experience may be considered in evaluating the appropriateness of the technique and frequency.
The applicant is requested to describe the inspection technique and frequency.
The inspection frequency should be justified by plant operating experience and should be adequate to detect the aging effects such that the intended function will be maintained during the period of extended operation.

NMC Response:

By letter dated February 25, 2004 (NRC 2004-0016), Nuclear Management Company (NMC), LLC, submitted the Point Beach Nuclear Plant (PBNP) Units 1 and 2 License Renewal Application (LRA). During the weeks of April 26 and June 7, 2004, the NRC performed an on-site audit of the PBNP aging management programs and aging management reviews. As a result of this audit and subsequent conversations between NMC and the NRC staff, the NRC staff requested various clarifications to the LRA. By letter dated July 12, 2004 (NRC 2004-0071), NMC submitted these LRA clarifications to the NRC staff. Several of these clarifications involved the Periodic Surveillance and Preventive Maintenance Program (LRA Section B2.1.15), including the responses to Audit items 69, 148 and 196.

The response to Audit item 196 provided a table that linked the aging effects/mechanisms managed by the Periodic Surveillance and Preventive Maintenance Program with the parameters monitored/inspected and the measurement methodology. The inspection method identified for "Loss of Heat Transfer" due to fouling was "General or Remote Visual." Where the material is in an oil or fuel oil environment, an oil sample will be taken and analyzed for evidence of Microbiologically Induced Corrosion (MIC), corrosion products, and/or other contaminants in lieu of these inspections. General or remote visual examinations will be performed in accordance with the requirements of ASME Section V and 10 CFR 50, Appendix B. This inspection methodology is capable of measuring the parameter monitored (i.e., tube fouling) and providing data that is adequate to conclude the aging effect is managed consistent with the current licensing basis. If a different inspection method is used, the basis for the revised inspection method will be documented. If degradation is identified through a visual inspection, additional non-destructive examination (NDE) may be performed to characterize the degradation and determine the extent of condition. The inspection frequency for the Periodic Surveillance and Preventive Maintenance Program activities credited for those line items in LRA Tables 3.3.2-7 and 3.3.2-9 will be justified by plant-specific operating experience during implementation of the program. This process will ensure that the activities will be adequate to detect aging effects such that the intended function will be maintained during the period of extended operation.

NRC Question RAI 3.3-6:

Loss of preload is an aging effect for closure bolting in high temperature or high pressure systems. NUREG-1801, XI.M18, "Bolting Integrity" program provides aging management inspections for this aging effect. LRA section 3.3 for the auxiliary systems does not identify loss of preload as an aging effect for closure bolting. The applicant is requested to discuss why the loss of preload was not identified as an aging effects for auxiliary systems closure bolting and the inspections in NUREG-1801, XI.M18 were not credited for managing this aging effect. This RAI is also applicable for closure bolting in the ESF and SPCS.

NMC Response:

NMC considered loss of preload for closure bolting to be a design driven effect, not an applicable aging effect for the Engineered Safety Features (ESF), Auxiliary Systems, and Steam and Power Conversion System (SPCS) system groupings. Operating temperatures in these three system groupings are below the threshold temperature where creep of the bolting material could occur. Additionally, a properly designed and installed bolted joint will not be affected by loss of preload. Leakage at joints is typically associated with improper joint installation (e.g., proper cleanliness, gasketing, and preload) or inadequate joint design, not relaxation of the bolting materials. Although PBNP does not consider loss of preload an aging effect, normal maintenance practices intended to preclude loss of pre-load are applied to pressure retaining bolted connections when they are assembled. These maintenance practices are proceduralized and include proper torque selection, torque patterns, thread engagement criteria, and inspection of bolting materials including gaskets. These procedures for joint installation incorporate industry bolting guidance, which also provide for the use of proper lubricants and sound bolt torquing practices. PBNP's plant specific operating experience shows that bolted joint failures due to loss of preload are not occurring within these system groupings. Therefore, the loss of preload due to stress relaxation for closure bolting in the Auxiliary Systems, ESF, and SPCS system groupings does not require aging management based on system operating temperatures and industry bolting practices.

Also note that the GALL line items for closure bolting in ESF (E.2-a, E.2-b), Auxiliary Systems (I.2-a, I.2-b), and SPCS (H.2-a, H.2-b), do not list loss of preload as an aging effect requiring management. Therefore, NMC's position that loss of preload is not an aging effect requiring management is consistent with GALL for bolting components in these system groupings.

Section 4.3.13 - Crane Load Cycle Limit

NRC Question RAI 4.3.13-1:

LRA Section 4.3.13, "Crane Load Cycle Limit," states that the load limit of the containment polar, auxiliary building, and turbine hall cranes are designed in accordance with CMAA-70 Class "A" service for 20,000 to 200,000 load cycles, and based on conservative usage assumptions, the cranes are expected to make 50,000 partial load lifts and less than 5,000 at or near rated load lift for the period of extended operation. The applicant is requested to provide the basis for concluding that 50,000 partial load lifts and less than 5,000 at or near rated load lift are in accordance with design of 20,000 to 200,000 load cycles.

NMC Response:

The unnumbered December 22, 1980, Generic Letter regarding the control of heavy loads (NUREG-0612), required a six month report. On January 11, 1982, PBNP provided the NRC a Revision 1 to that six month report. The Revision 1 submittal contained Appendix B detailing the PBNP crane design review, which has been excerpted below.

APPENDIX B

CONTAINMENT POLAR AND TURBINE BUILDING MAIN CRANE DESIGN REVIEW

CMAA Specification 70 and ANSI B30.2-1976 apply to the Containment Building, Turbine Building and Auxiliary Building Cranes.

The Containment Building, Turbine Building and Auxiliary Building Cranes were designed to comply with EOCI Specification 61, which was superceded by CMAA Specification 70. The differences between these two specifications which impact the evaluation of the safe handling of heavy loads are addressed below with respect to the Containment and Turbine Building Cranes. The Auxiliary Building Crane will be modified to provide adequate redundant lifting features. The modification will take into consideration the requirements of CMAA specification 70 and ANSI B30.2-1976 and the guidance of Regulatory Guide 1.13.

It is to be noted that the Franklin Research Center, a division of the Franklin Institute, conducted a comparison of the recommendations of CMAA-70 with those contained in EOCI-61. Generally, the requirements of CMAA-70 represent the codification of good engineering practice which should have been incorporated in cranes built to EOCI-61 specification although specific requirements were not contained in EOCI-61. The Franklin Research Center study is addressed in "Technical Evaluation Report," NRC Docket No. 50-334, dated September 24, 1981, performed under NRC Contract No. NRC-03-79-118.

Fatigue Considerations

CMAA-70, Article 3.3.3.1.3 provides substantial guidance with respect to fatigue failure by indicating allowable stress ranges for various structural members in joints under repeated loads. EOCI-61 does not address fatigue failure. The requirements of CMAA-70 are not of consequence for the Containment Building and Turbine Building Cranes since these cranes are not generally subjected to frequent loads at or near design conditions (CMAA-70 provides allowable stress ranges for loading cycles in excess of 20,000 cycles) and are not generally subjected to stress reversal (CMAA-70 allowable stress range is reduced to below the basic allowable stress for only a limited number of joint configurations).

As used in the LRA, a rated load lift is equal to or greater than 50 percent of the cranes' rating. A partial load lift is less than 50 percent of the crane's rating. The Auxiliary Building crane is the most limiting for rated load lifts, while the Containment crane is most limiting for partial load lifts.

The conservative usage assumptions for these two cranes are:

- Auxiliary Building Crane – This crane is used for fuel cask lifts (NUHOMS), miscellaneous maintenance loads, and original fuel casks (VCS-24). The estimated number of lifts is 2700, 600, and 892, respectively, totaling less than 5,000 lifts for the 60 year life of the plant.

- Containment Crane – It is assumed that a total of 60 outages, with 20 days of lifting per outage, and a total of 40 lifts per day will produce a total of less than 50,000 lifts for the 60 year life of the plant.

Consistent with the PBNP Current Licensing Basis (CLB) and loading and usage patterns, fatigue failures are not a concern for the Containment Building, Turbine Building and Auxiliary Building cranes during the period of extended operation.