July 5, 2005

NRC 2005-0071
10 CFR 54

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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 March 30, 2005, the Nuclear Regulatory Commission (NRC) requested additional information regarding Aging Management Programs (Section B2.1 of the LRA). This information request was also included in the NRC draft Safety Evaluation Report of May 2, 2005. During NMC telephone conferences with the NRC staff on April 28 and May 26, 2005, additional time was granted to respond to these questions in order to include additional clarifications in the response. The enclosure to this letter contains NMC's response to the staff's questions.

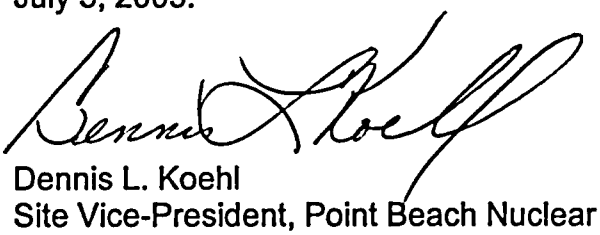
Should you have any questions concerning this submittal, please contact Mr. James E. Knorr at (920) 755-6863.

This letter contains the following new commitment.

As a part of the ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program, the requirements of Code Case N-616 will be supplemented by a VT-2 visual examination performed each outage for Class 1 systems and each inspection period for Class 2 and 3 systems with the insulation removed from the bolted connections. The connections are not pressurized during these examinations.

A093

I declare under penalty of perjury that the forgoing is true and correct. Executed on July 5, 2005.



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

Enclosure

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). This information request was also included in the NRC draft Safety Evaluation Report as an open item (OI).

The NRC staff's question is restated below with the Nuclear Management Company (NMC) response following.

Aging Management Programs

NRC Question RAI B2.1 (OI B2.1):

Several currently approved relief requests, shown in the attached Table 1, were reviewed by the project team during the audit and review of AMPs B2.1.1, "ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program" and B2.1.2, "ASME Section XI, Subsections IWE and IWL Inservice Inspection Program." The relief requests were presented as the bases for taking exceptions to the following GALL Report AMPs:

(1) GALL Section XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD"
(2) GALL Section XI.M3, "Reactor Head Closure Studs"
(3) GALL Section XI.S1, "ASME Section XI, Subsection IWE"
(4) GALL Section XI.S2, "ASME Section XI, Subsection IWL"

Relief requests are approved by the NRC as described in 10 CFR 50.55a, Codes and Standards. Relief requests only apply to the current licensing basis (CLB) issues and are time limited. Consequently, citing approved relief requests cannot be used as a basis for taking exception to the GALL since they may not be renewed.

Each exception to the GALL must be evaluated for NRC approval based on the technical bases that are associated with aging management regardless of whether there is a current, approved, related relief request. Also, it should be noted that approval of an exception to GALL with respect to a plant's AMP does not mean that a relief request that covers the same issue will be approved during the period of plant life extension. The 10 CFR 50.55a process must still be used for relief request approval. Citing a relief request does not provide an acceptable basis to take an exception to GALL.

The staff requests the applicant to provide the technical bases, as it relates to aging management, without referencing the relief request, for the exceptions taken to AMP B2.1.1, "ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program" and to AMP B2.1.2, "ASME Section XI, Subsections IWE and IWL Inservice Inspection Program."

TABLE 1 - Point Beach Nuclear Plant LRA Relief Requests	
Relief Request No.	**Relief Request Description** LRA Pages B-13 through B-16 states, "The following Relief Requests (RR) have been approved by the NRC and have been incorporated into the ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program"
RR 1	Altering the Date of the Start of the Fourth Inspection Interval
RR 2	Use of Later Code Editions
RR 3	Risk Informed Examination of Class 1 and Class 2 Piping Butt Welds (Code Case N-578 and EPRI TR-112657)
RR 4	Alternate Requirements to Repair and Replacement Documentation Requirements and Inservice Inspection Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000 (Code Case - 532-1)
RR 5	Alternate Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure-Retaining Bolted Connections (Code Case - 533-1)
RR 6	Corrective Action for Leakage Identified at Bolted Connections (Code Case - 566-1)
RR 7	Alternate Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure-Retaining Bolted Connections, Section XI, Division 1 (Code Case - 616)
RR 8	Successive Inspections (Code Case - 624)
RR 9	Alternative to Welding and Brazing Performance Qualification Requirements
RR 10	Relief from Regenerative Heat Exchanger Examinations
RR 11	Emergency Diesel System VT-2 Examination

TABLE 1 - Point Beach Nuclear Plant LRA Relief Requests	
RR 12	Request for Alternative to ASME Section XI, Appendix VIII, Supplement 10
RR ERR-1	Elimination of VT-3 examinations of seal and gaskets
RR ERR-5	No Successive Examination of Repairs
RR ERR-6	Elimination of Required Bolt Torque or Tension Tests
RR ERR-7	Elimination of the Need for Venting of Leak Chase Channels During Integrated Leak Rate Tests
RR ERR-9	Allowing the Qualification and Certification of NDE Personnel to a Written Practice in Accordance with SNT-TC1A Instead of CP-189
RR LRR-1	Relaxing the Illumination and Direct Examination Distance Requirements of IWA-2210
RR LRR-2	Allowing a General Visual Inspection of Inaccessible Concrete Surfaces Instead of the VT-3 Examination Required by IWL-2510(a)
RR 1-24 (Unit 1)	Use of ASME Code, Section XI, 1998 Edition with Addenda through 2000
RR 2-30 (Unit 2)	Use of ASME Code, Section XI, 1998 Edition with Addenda through 2000

NMC Response:

ASME SECTION XI, SUBSECTIONS IWB, IWC, AND IWD INSERVICE INSPECTION PROGRAM

ASME SECTION XI, SUBSECTION IWF INSERVICE INSPECTION PROGRAM

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Section XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," Section XI.M3, "Reactor Head Closure Studs," and Section XI.S3, "ASME Section XI, Subsection IWF," are based on the 1995 edition through 1996 addenda of ASME Section XI, as approved in 10 CFR 50.55a. The ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (LRA Section B2.1.1) and the ASME Section XI, Subsection IWF Inservice Inspection Program

(LRA Section B2.1.3) are based on the 1998 edition through 2000 addenda of ASME Section XI, as modified by 10 CFR 50.55a.

The following alternatives to the requirements of ASME Section XI have been reviewed and approved by the NRC under 10 CFR 50.55a for use at PBNP Units 1 and 2 during the fourth inspection interval. The fourth inspection interval ends on June 30, 2012, almost two years after entering the period of extended operation for PBNP Unit 1. Those alternatives that have been determined to be aging management related and are exceptions to NUREG-1801 are justified below from an aging management point of view, in accordance with 10 CFR 54. Any future alternatives to ASME Section XI processed during the fourth inspection interval that are aging management related and exceptions to NUREG-1801 will be justified from an aging management point of view and reviewed/approved by the NRC under 10 CFR 54, as well as 10 CFR 50.55a, before they are implemented.

Subsequent intervals during the period of extended operation will use the edition and addenda of ASME Section XI required by 10 CFR 50.55a, as reviewed and approved by the NRC staff for aging management under 10 CFR 54. Any alternatives to these future requirements that are aging management related and exceptions to NUREG-1801 will be justified from an aging management point of view and reviewed/approved by the NRC staff under 10 CFR 54, as well as 10 CFR 50.55a, before they are implemented.

1) Altering the Date of the Start of the Fourth Inspection Interval

The start date of the fourth interval of the Inservice Inspection (ISI) programs was altered to be the same for both PBNP Units 1 and 2. PBNP Units 1 and 2 began commercial operation on December 21, 1970, and October 1, 1972, respectively. These dates are almost two years apart (650 days), and since the ISI programs are linked to the commercial operating dates, the editions of ASME Section XI effective during the 650 days between the unit updates would be different. Therefore, the date for the start of the fourth interval for both units was changed to July 1, 2002. As a result, the fourth interval for Unit 1 will end almost two years after entering the period of extended operation. There will be no reduction in the number of examinations performed during the fourth interval or subsequent intervals during the period of extended operation for either unit as a result of the interval date change.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

2) Use of ASME Code, Section XI, 1998 Edition with Addenda through 2000

This alternative allows the use of the 1998 edition through 2000 addenda of ASME Section XI, as modified by 10 CFR 50.55a, for both PBNP Units 1 and 2 ISI programs during the fourth inspection interval. The fourth inspection interval began on July 1, 2002 and ends on June 30, 2012, for both PBNP Units 1 and 2.

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Section XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," Section XI.M3, "Reactor Head Closure Studs," and Section XI.S3, "ASME Section XI, Subsection IWF," are based on the 1995 edition through 1996 addenda of ASME Section XI, as approved in 10 CFR 50.55a. Currently at PBNP, both the ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (LRA Section B2.1.1) and the ASME Section XI, Subsection IWF Inservice Inspection Program (LRA Section B2.1.3) are based on the 1998 edition through 2000 addenda of ASME Section XI, as modified by 10 CFR 50.55a. The use of the 1998 edition through 2000 addenda of ASME Section XI, as modified by 10 CFR 50.55a, has already been reviewed and approved by the NRC staff for aging management of systems and components within the scope of license renewal.

Conclusion

This alternative is not an exception to NUREG-1801. The use of the 1998 edition through 2000 addenda of ASME Section XI, as modified by 10 CFR 50.55a, has already been reviewed and approved by the NRC staff for aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

3) Risk-Informed Examination of Class 1 and Class 2 Piping Butt Welds (Code Case N-578 and EPRI TR-112657)

This alternative implements a Risk-Informed Inservice Inspection (RI-ISI) Program for ASME Class 1 and 2 piping welds (Categories B-F, B-J, C-F-1, and C-F-2 only), for both PBNP Units 1 and 2. The RI-ISI program provides an acceptable alternative to the piping ISI requirements with regards to (1) the number of locations, (2) the locations of inspections, and (3) the method of inspection. The RI-ISI program maintains the fundamental requirements of ASME Section XI, such as the examination technique, examination frequency, and acceptance criteria. Although the RI-ISI program reduces the number of required examination locations in some cases, it maintains an acceptable level of quality and safety by focusing inspections on the most safety significant welds with nondestructive examination (NDE) techniques that are more focused towards finding the type of expected degradation as well as the types of flaws and degradation found during traditional inspections.

A systematic approach was used to identify component susceptibility to common degradation mechanisms and to categorize these degradation mechanisms into the appropriate degradation categories with respect to their potential to result in a postulated leak or rupture in the pressure boundary. An evaluation to determine the susceptibility of components to a particular degradation mechanism that may be a precursor to a leak or rupture in the pressure boundary, and an independent assessment of the consequences of a failure at that location were performed. Industry and plant-specific piping failure information (i.e., operating experience) was used to identify piping degradation mechanisms and failure modes, and consequence evaluations performed using PRAs to establish safety ranking of piping segments for selecting new inspection locations. The degradation mechanisms identified in the RI-ISI program include thermal fatigue, thermal transients, intergranular stress-corrosion cracking (IGSCC), and primary water stress-corrosion cracking (PWSCC). The consequences of pressure boundary failures were evaluated and ranked on their impact on core damage and early release. Therefore, redistributing the welds to be inspected with consideration of the safety significance of the segments provides assurance that segments whose failure have a significant impact on plant risk receive an acceptable and improved level of inspection.

The objective of ISI, required by ASME Section XI, is to identify conditions (e.g., flaw indications) that are precursors to leaks and ruptures in the pressure boundary that may impact plant safety. The RI-ISI program meets this objective. The risk-informed selection process not only identifies the risk-important areas of the piping systems but also defines appropriate examination methods, examination volumes, procedures, and evaluation standards necessary to address the degradation mechanism(s) of concern and the ones most likely to occur at each location to be inspected. Therefore, the examination methods of the RI-ISI program are acceptable since they are selected based on specific degradation mechanisms, pipe sizes, and materials of concern.

The risk significance of piping segments is taken into account in defining the inspection scope of the RI-ISI program. The RI-ISI program methodology provides reasonable assurance that any reduction in inspections will not lead to degraded piping performance when compared to the existing performance levels. Inspections are focused on locations with active degradation mechanisms as well as selected locations that monitor the performance of system piping. Inspection strategies ensure that failure mechanisms of concern have been addressed and there is adequate assurance of detecting damage before structural integrity is affected.

The RI-ISI program is a living program that includes performance monitoring and feedback provisions to confirm the assumptions and analyses used in the development of the program. Feedback of relevant information is used to ensure the appropriate identification of safety-significant piping locations. As a

minimum, risk-ranking of piping segments is reviewed and adjusted on an ASME-period basis. Significant changes may require more frequent adjustment of the risk-ranking of piping segments as directed by NRC bulletin or generic letter requirements, or industry and plant-specific feedback (i.e., operating experience).

The ASME Section XI, Subsections IWB, IWC, and IWD ISI Program (LRA Section B2.1.1) is credited for managing cracking due to flaw growth or stress-corrosion cracking on ASME Class 1 piping welds (LRA Table 3.1.2-1). These aging effects are the result of degradation mechanisms already considered in the RI-ISI program, as noted above.

This alternative is also credited for the inspection of small bore piping prior to the period of extended operation instead of the One-Time Inspection Program, as recommended in NUREG-1801 Section XI.M32. The RI-ISI program will require examination of a sample of susceptible risk significant small bore (< 4 inch) ASME Class 1 and 2 piping. The RI-ISI program will require volumetric examination of non-socket welds and surface examination of socket welds in the sample. Approximately twenty small bore piping locations per unit will be examined under the RI-ISI program. Therefore, the RI-ISI program provides an acceptable alternative with regards to (1) the number of locations, (2) the locations of inspections, and (3) the method of inspection for small bore ASME Class 1 and 2 piping.

The aging effects requiring management on other ASME Class 2 piping welds are managed through different aging management programs (LRA Tables 3.2.2-1, 3.3.2-1, 3.3.2-2, and 3.3.2-3). These aging management programs are the Water Chemistry Control Program (LRA Section B2.1.24) or the Closed-Cycle Cooling Water System Surveillance Program (LRA Section B2.1.9), with the effectiveness of these programs verified through the One-Time Inspection Program (LRA Section B2.1.13).

The Water Chemistry Control Program mitigates aging effects by controlling the environment to which internal surfaces of systems and components are exposed. The aging effects are minimized by controlling the chemical species that cause the underlying mechanisms that result in aging effects. The program provides assurance that an elevated level of contaminants and oxygen do not exist in systems and components covered by the program, and thus minimizes the occurrences of aging effects.

The Closed-Cycle Cooling Water System Surveillance Program manages aging effects in closed systems that are not subject to significant sources of contamination, in which the water chemistry is controlled, monitored, and kept within specified limits, and in which the heat is not directly rejected to the ultimate heat sink. The program includes (a) maintenance of system corrosion inhibitor

concentrations to minimize degradation, and (b) periodic or one-time testing and inspections to evaluate system and component performance.

The One-Time Inspection Program is used to verify the effectiveness of the Water Chemistry Control Program and Closed-Cycle Cooling Water System Surveillance Program. The One-Time Inspection Program addresses the potentially long incubation period for aging effects and provides a means of verifying that aging effects are either not occurring or progressing so slowly as to have negligible effect on the intended function(s) of systems and components.

Conclusion

This alternative is considered an exception to NUREG-1801, Section XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," under the element of "Detection of Aging Effects" in the ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (LRA Section B2.1.1). This exception provides acceptable aging management for ASME Class 1 piping welds, since the inspection strategies ensure that the failure mechanisms of concern have been addressed and there is adequate assurance of detecting damage before structural integrity is affected. The RI-ISI program also provides an acceptable alternative with regards to (1) the number of locations, (2) the locations of inspections, and (3) the method of inspection for small bore ASME Class 1 and 2 piping. The aging effects requiring management on other ASME Class 2 piping welds are managed through different aging management programs. These aging management programs are the Water Chemistry Control Program or the Closed-Cycle Cooling Water System Surveillance Program, with the effectiveness of these programs verified through the One-Time Inspection Program. Therefore, reasonable assurance is provided that aging effects will be managed such that systems and components within the scope of license renewal will continue to perform their intended functions consistent with the current licensing basis for the period of extended operation.

4) Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Inspection Summary Report Preparation and Submission as Required by IWA-4000 and IWA-6000 (Code Case N-532-1)

This alternative allows the use of ASME Code Case N-532-1, "Alternative Requirements to Repair and Replacement Documentation Requirements and Inservice Summary Report Preparation and Submission," subject to the limitations identified in Regulatory Guide (RG) 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (Revision 13, dated January 2004). This alternative only affects documentation and reporting requirements. The information provided in the documentation required by the code case can be used in the same manner to assess the safety implications of code activities performed during an outage. Reviews using this information provide the same or improved level of safety as reviews that may have been

conducted using the older reporting requirements. Therefore, this alternative provides an acceptable level of quality and safety.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

5) Alternative Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure-Retaining Bolted Connections (Code Case N-533-1)

This alternative allows the use of ASME Code Case N-533-1, "Alternative Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure-Retaining Bolted Connections, Section XI, Division 1," subject to the limitations identified in RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (Revision 13, dated January 2004). ASME Section XI, Article IWA-5242(a) requires the removal of insulation from pressure-retaining bolted connections in systems borated for the purpose of controlling reactivity when performing VT-2 visual examinations during system pressure tests. The code requires this examination to be performed each refueling outage for Class 1 systems and each inspection period for Class 2 and 3 systems.

ASME Code Case N-533-1 allows VT-2 visual examinations of Class 1, 2, and 3 bolted connections during system pressure tests to be performed without removing the insulation. The system pressure test includes a minimum four-hour hold time at normal operating pressures and temperatures, before performing the VT-2 examination with the insulation installed on bolted joints. The four-hour hold time allows any leakage to penetrate the insulation, thus providing a means of detecting leakage with the insulation in place. In addition, a VT-2 visual examination is performed each outage for Class 1 systems and each inspection period for Class 2 and 3 systems with the insulation removed from the bolted connections. The connections are not pressurized during these examinations. However, any minor leakage, as indicated by the presence of boric acid crystals or residue, will be detected by removing the insulation. These examinations will find evidence of leakage by having the examiners look for boric acid residue, which accumulates around leakage sites, or any other evidence of leakage. Any leakage is evaluated in accordance with ASME Section XI, Article IWA-5250. As a result, this alternative provides reasonable assurance of leak-tightness and bolting integrity for pressure-retaining bolted connections in Class 1, 2, and 3 systems borated for the purpose of controlling reactivity.

All other examination requirements for Class 1, 2, and 3 pressure-retaining bolting are in accordance with ASME Section XI, Tables IWB 2500-1, IWC 2500-1, and IWD 2500-1, respectively. For Class 1 components, Table IWB 2500-1, Examination Category B-G-1, for bolting greater than two inches in diameter, specifies volumetric examination of studs and bolts and visual VT-1 examination of surfaces of nuts, washers, bushings, and flanges. Examination Category B-G-2 for bolting 2 inches, or smaller, requires visual VT-1 examination of surfaces of bolts, studs, and nuts. For Class 2 components, Table IWC 2500-1, Examination Category C-D, for bolting greater than two inches in diameter, requires volumetric examination of studs and bolts. Examination Categories B-P, C-H, and D-B require VT-2 visual examination (IWA-5240) during system leakage testing of all pressure-retaining Class 1, 2, and 3 components, according to Tables IWB 2500-1, IWC 2500-1, and IWD 2500-1, respectively. Therefore, the extent and schedule of inspections in accordance with ASME Section XI and this alternative ensure detection of aging degradation before the loss of the intended function of the closure bolting.

Conclusion

This alterative is not an exception to NUREG-1801. The extent and schedule of inspections in accordance with ASME Section XI and this alternative ensure detection of aging degradation before the loss of the intended function of the closure bolting. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

6) Corrective Action for Leakage Identified at Bolted Connections (Code Case N-566-1)

This alternative allows the use of ASME Code Case N-566-1, "Corrective Action for Leakage Identified at Bolted Connections, Section XI, Division 1," subject to the limitations identified in RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (Revision 13, dated January 2004). ASME Section XI, Article IWA-5250(a)(2) requires one of the bolts be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA 3100 if leakage occurs at a bolted connection. IWA-5250(a)(2) requires the bolt that is closest to the source of leakage be selected for removal. In lieu of these requirements, an attempt is made to stop the leakage and an evaluation of the susceptibility of the bolting to corrosion and failure is performed.

ASME Code Case N-566-1 requires that the leakage be stopped and the joint integrity be reviewed. If the leakage is not stopped, the joint is evaluated in accordance with IWB-3142.4 for joint integrity, which relies on an analytical evaluation of a component containing relevant conditions for continued service. The evaluation for the specific case would consider the number and service age of the bolts, bolt and component material, corrosiveness of process fluid, leakage location and system function, leakage history at the connection or other

components, and visual evidence of corrosion at the assembled connection. This allows a systematic approach and sound engineering judgment, provided that as a minimum, all of the evaluation factors listed in the code case are considered. Therefore, the use of ASME Code Case N-566-1 provides an acceptable level of quality and safety for Class 1, 2, and 3 pressure-retaining bolted connections.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative involves corrective actions for leakage identified at bolted connections and has no bearing on the aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

7) Alternative Requirements for VT-2 Visual Examination of Class 1, 2, and 3 Insulated Pressure-Retaining Bolted Connections, Section XI, Division 1 (Code Case N-616)

This alternative allows the use of ASME Code Case N-616, "Alternative Requirements for VT-2 Visual Examination of Classes 1, 2, and 3 Insulated Pressure Retaining Bolted Connections, Section XI, Division 1," subject to the limitations identified in RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (Revision 13, dated January 2004). ASME Section XI, Article IWA-5242(a) requires the removal of insulation from pressure-retaining bolted connections in systems borated for the purpose of controlling reactivity when performing VT-2 visual examinations during system pressure tests. The code requires this examination to be performed each refueling outage for Class 1 systems and each inspection period for Class 2 and 3 systems.

ASME Code Case N-616 allows VT-2 visual examinations of Class 1, 2, and 3 bolted connections during system pressure tests to be performed without removing the insulation. This code case provides an acceptable level of quality and safety by requiring ASME Section XI examinations to be performed in the same manner as the remainder of the pressure-retaining components. The bolting referenced in this code case has been determined to be corrosion resistant, except for some specific types of material as stated in the limitations of RG 1.147. The examinations performed will find evidence of leakage by looking at those areas where water accumulates around leakage sites (i.e., by looking at the insulation and areas under the bolted connections for evidence of leakage), or evidence of boric acid accumulation.

The requirements of this code case are supplemented by the following conditions, as stated in the limitations of RG 1.147.

1. Insulation will be removed for VT-2 visual examination during the system pressure test for any 17-4 PH stainless steel or 410 stainless steel stud or bolt aged at a temperature below 1100 degrees F or with a hardness above R_c 30. The 17-4 PH stainless and 410 stainless steel are suitable for use in contact with primary water if they are aged at a temperature of 1100 degrees F or higher. If they are aged at a lower temperature, they become susceptible to primary water stress corrosion cracking. The hardness of these alloys should be below R_c 30 if they are properly heat treated.

2. For A-286 stainless steel studs or bolts, the preload must be verified to be below 100 ksi or the thermal insulation must be removed and the joint visually examined. A-286 stainless steel is susceptible to stress corrosion cracking in primary water if preloaded above 100 ksi.

3. For nuts conforming to SA-194, removal of the insulation for visual examination is not necessary based on experience.

4. A four-hour hold time at operating temperature and pressure is performed prior to conducting VT-2 visual examinations. The four-hour hold time allows any leakage to penetrate the insulation, thus providing a means of detecting leakage with the insulation in place.

The requirements of this code case will also be supplemented by a VT-2 visual examination performed each outage for Class 1 systems and each inspection period for Class 2 and 3 systems with the insulation removed from the bolted connections. The connections are not pressurized during these examinations. As a result, this alternative provides reasonable assurance of leak-tightness and bolting integrity for pressure-retaining bolted connections in Class 1, 2, and 3 systems borated for the purpose of controlling reactivity.

All other examination requirements for Class 1, 2, and 3 pressure-retaining bolting are in accordance with ASME Section XI, Tables IWB 2500-1, IWC 2500-1, and IWD 2500-1, respectively. For Class 1 components, Table IWB 2500-1, Examination Category B-G-1, for bolting greater than two inches in diameter, specifies volumetric examination of studs and bolts and visual VT-1 examination of surfaces of nuts, washers, bushings, and flanges. Examination Category B-G-2, for bolting two inches or smaller, requires visual VT-1 examination of surfaces of bolts, studs, and nuts. For Class 2 components, Table IWC 2500-1, Examination Category C-D, for bolting greater than two inches in diameter, requires volumetric examination of studs and bolts. Examination Categories B-P, C-H, and D-B require VT-2 visual examination (IWA-5240) during system leakage testing of all pressure-retaining

Class 1, 2, and 3 components, according to Tables IWB 2500-1, IWC 2500-1, and IWD 2500-1, respectively. Therefore, the extent and schedule of inspections in accordance with ASME Section XI and this alternative ensure detection of aging degradation before the loss of the intended function of the closure bolting.

Conclusion

This alterative is not an exception to NUREG-1801. The extent and schedule of inspections in accordance with ASME Section XI and this alternative ensure detection of aging degradation before the loss of the intended function of the closure bolting. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

8) Successive Inspections (Code Case N-624)

This alternative allows the use of ASME Code Case N-624, "Successive Inspections, Section XI, Division 1," subject to the limitations identified in RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1" (Revision 13, dated January 2004). ASME Section XI, Articles IWB-2420(a), IWC-2420(a), IWD-2420(a), and IWF-2420(a) require the sequence of component examinations which was established during the first inspection interval to be repeated during each successive inspection interval, to the extent practical. In addition, the code requires a distribution of examinations in accordance with ASME Section XI, Article IWX-2400, "Inspection Schedule." This alternative allows the sequence of examinations established in the previous inspection interval to be modified in a manner that reduces scaffold, insulation, and radiation exposure. There is no reduction in the number of examinations as a result of this code alternative, rather, the sequence of examinations has been changed. The number of examinations performed meets or exceeds the minimum number required by each Examination Category. The number of components examined meets the percentage requirements of the ISI program (Program B). Therefore, this alternative provides reasonable assurance of the structural and leakage integrity of the affected systems and components.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

9) Alternative to Welding and Brazing Performance Qualification Requirements (Code Case N-600)

This alternative allows the use of a welder, welding operator, brazer, or brazing operator qualified by other owners in lieu of the qualification requirements of ASME Section XI, Article IWA-4000. Specifically, this alternative allows the use of Code Case N-600, "Transfer of Welder, Welding Operator, Brazer, and Brazing Operator Qualifications Between Owners," for both PBNP Units 1 and 2. Code Case N-600 permits welders, welding operators, brazers, and brazing operators qualified by one owner to be used by another owner provided the conditions/requirements listed in Code Case N-600 are met. The NRC has reviewed Code Case N-600 for inclusion in a future revision of RG 1.147 (Proposed Revision 14, dated April 2004) and has established no additional conditions for its use. This alternative provides an acceptable level of quality and safety, since welding and brazing personnel qualified by other NRC-licensed facilities have already demonstrated an acceptable level of quality and safety.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

10) Relief from Regenerative Heat Exchanger Examinations

This alternative allows examination of only one of the three vessels comprising the regenerative heat exchangers for PBNP Units 1 and 2, as opposed to the requirement to examine all three of the vessels. This alternative allows the examination of the bottom heat exchanger vessel since significant personnel radiation exposure would be encountered in examining the upper two vessels of the heat exchanger. The regenerative heat exchanger is a high radiation component located inside a locked high radiation area. It is the greatest single source of radiation exposure during a normal refueling outage for ISI and support personnel. To perform the examinations as required, would result in an excessive radiation dose accumulation. Therefore, this alternative results in a significant reduction in radiation dose accumulation.

The lower vessel of the regenerative heat exchanger would be 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 volumetric and surface (where required) examinations of the subject welds in the lower vessel of the regenerative heat

exchanger assembly would detect any pattern of degradation, if present. In addition, required VT-2 visual examinations are performed during system leakage tests. Therefore, this alternative provides an acceptable level of quality and safety.

The ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (LRA Section B2.1.1) is not credited for managing aging effects on the regenerative heat exchangers during the period of extended operation. The aging effects requiring management on the regenerative heat exchangers are managed through different aging management programs (LRA Table 3.3.2-1). These aging management programs are the Water Chemistry Control Program (LRA Section B2.1.24) and the One-Time Inspection Program (LRA Section B2.1.13), with the effectiveness of water chemistry control verified through the One-Time Inspection Program.

The Water Chemistry Control Program mitigates aging effects by controlling the environment to which internal surfaces of systems and components are exposed. The aging effects are minimized by controlling the chemical species that cause the underlying mechanisms that result in aging effects. The program provides assurance that an elevated level of contaminants and oxygen do not exist in systems and components covered by the program and thus minimizes the occurrences of aging effects.

The One-Time Inspection Program is used to verify the effectiveness of the Water Chemistry Control Program. The One-Time Inspection Program addresses the potentially long incubation period for aging effects and provides a means of verifying that aging effects are either not occurring or progressing so slowly as to have negligible effect on the intended function(s) of systems and components.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative has no bearing on the aging management of the regenerative heat exchangers. The aging effects requiring management on the subject heat exchangers are managed through different aging management programs. These aging management programs are the Water Chemistry Control Program and the One Time Inspection Program, with the effectiveness of water chemistry control verified through the One-Time Inspection Program. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

11) Emergency Diesel System VT-2 Examination

This alternative allows the use of Technical Specification surveillance testing in lieu of the requirements to perform VT-2 visual examinations and system leakage

and hydrostatic testing on Class 3 pressure retaining components of certain Emergency Diesel Generator (EDG) subsystems. The auxiliary support subsystems addressed within the scope of this alternative include the EDG starting air systems, fuel oil systems, and the EDG G03 and G04 glycol cooling systems.

The primary intent of Technical Specification surveillance testing is slightly different from the code required examinations. Technical Specifications are intended to demonstrate component operability, whereas system leakage and hydrostatic tests are intended to demonstrate pressure boundary integrity. However, successful EDG operability testing requires the associated subsystems to maintain pressure boundary integrity. As such, the tests provide an indirect verification of the leakage integrity of the pressure boundary, in lieu of a direct visual examination performed under normal operating pressure. Surveillance testing is performed at more frequent intervals and the parameters monitored ensure that the leakage integrity of the pressure boundary is maintained. Therefore, this alternative provides an acceptable level of quality and safety for components in the EDG subsystems.

The ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program (LRA Section B2.1.1) is not credited for managing aging effects on these EDG auxiliary support subsystems during the period of extended operation. The aging effects requiring management on these EDG auxiliary support subsystems are managed through different aging management programs (LRA Table 3.3.2-7), as discussed below.

Aging effects on the starting air systems for EDG G01 and G02 are managed during the period of extended operation by a combination of the Periodic Surveillance and Preventive Maintenance Program (LRA Section B2.1.15) and the Tank Internal Inspection Program (LRA Section B2.1.22). (The EDG starting air systems for G03 and G04 have air dryers and, therefore, have no aging effects requiring management.) The Tank Internal Inspection Program manages aging effects on the internal surfaces of carbon steel tanks. The EDG starting air receivers are included within the scope of this program. This program provides for periodic inspections to confirm that aging effects will not impair tank intended functions. Tank wall thinning of internal surfaces may be detected by direct visual inspection from inside the tank or indirectly by UT wall thickness measurements from outside the tank. The Periodic Surveillance and Preventive Maintenance Program manages aging effects for certain components within the scope of license renewal. The program provides for inspection, examination, or testing of selected components, including fasteners, for evidence of age-related degradation on a specified frequency based on operating experience or other requirements (e.g., Technical Specifications or code requirements). Periodic EDG preventative maintenance overhaul activities and surveillance testing are also credited for managing the aging effects of the starting air systems for

G01 and G02, as part of the Periodic Surveillance and Preventive Maintenance Program.

Aging effects on the EDG fuel oil systems for all four EDGs are managed during the period of extended operation by the Fuel Oil Chemistry Control Program (LRA Section B2.1.12), with the effectiveness of fuel oil chemistry control verified through the One-Time Inspection Program (LRA Section B2.1.13). The Fuel Oil Chemistry Control Program mitigates and manages aging effects on the internal surfaces of fuel oil storage tanks and associated components in systems that contain fuel oil. The program includes (a) surveillance and monitoring procedures for maintaining fuel oil quality by controlling contaminants in accordance with applicable ASTM standards, (b) periodic draining of water from fuel oil tanks, (c) periodic or conditional visual inspections of internal surfaces or wall thickness measurements (e.g., UT) from external surfaces of fuel oil tanks, and (d) one-time inspections of a representative sample of components in systems that contain fuel oil. The objective of the Fuel Oil Chemistry Control Program is to minimize the introduction and presence of contaminants in the PBNP Fuel Oil System that could cause degradation of components in systems that contain fuel oil. A representative sample of components in systems that contain fuel oil will be inspected via the One-Time Inspection Program to verify the effectiveness of the Fuel Oil Chemistry Control Program. The One-Time Inspection Program addresses the potentially long incubation period for aging effects and provides a means of verifying that aging effects are either not occurring or progressing so slowly as to have negligible effect on the intended function(s) of systems and components.

Aging effects on the EDG glycol cooling systems for G03 and G04 are managed during the period of extended operation by the Closed-Cycle Cooling Water System Surveillance Program (LRA Section B2.1.9), with the effectiveness of the program verified through the One-Time Inspection Program (LRA Section B2.1.13). The Closed-Cycle Cooling Water System Surveillance Program manages aging effects in closed systems that are not subject to significant sources of contamination, in which the water chemistry is controlled, monitored, and kept within specified limits, and in which the heat is not directly rejected to the ultimate heat sink. The program includes (a) maintenance of system corrosion inhibitor concentrations to minimize degradation, and (b) periodic or one-time testing and inspections to evaluate system and component performance. The One-Time Inspection Program is used to verify the effectiveness of the Closed-Cycle Cooling Water System Surveillance Program. The One-Time Inspection Program addresses the potentially long incubation period for aging effects and provides a means of verifying that aging effects are either not occurring or progressing so slowly as to have negligible effect on the intended function(s) of systems and components.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative has no bearing on the aging management of these EDG auxiliary support subsystems. The aging effects requiring management on these EDG auxiliary support subsystems are managed through different aging management programs. Aging effects on the EDG starting air systems for G01 and G02 are managed during the period of extended operation by a combination of the Periodic Surveillance and Preventive Maintenance Program and the Tank Internal Inspection Program. Aging effects on the EDG fuel oil systems for all four EDGs are managed during the period of extended operation by the Fuel Oil Chemistry Control Program, with the effectiveness of fuel oil chemistry control verified through the One-Time Inspection Program. Aging effects on the EDG glycol cooling systems for G03 and G04 are managed during the period of extended operation by the Closed-Cycle Cooling Water System Surveillance Program, with the effectiveness of the program verified through the One-Time Inspection Program. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

12) Alternative to ASME Section XI, Appendix VIII, Supplement 10

ASME Section XI, Appendix VIII, Supplement 10 contains the qualification requirements for procedures, equipment, and personnel involved with examining dissimilar metal welds using ultrasonic techniques. In lieu of these requirements, this alternative allows the use of the dissimilar metal weld criteria of the Electric Power Research Institute (EPRI)-Performance Demonstration Initiative (PDI) Program. This alternative does not affect the ISI programs inspection scope, schedule or acceptance criteria. The NRC staff has evaluated the differences between the EPRI-PDI Program and the requirements of ASME Section XI, Appendix VIII, Supplement 10, and found that this alternative provides an acceptable level of quality and safety.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is administrative in nature and has no bearing on the aging management of systems and components within the scope of license renewal. As a result, any exceptions identified in LRA Sections B2.1.1 and B2.1.3 based upon this alternative are withdrawn.

Subsequent to the submittal of the LRA, the following alternative to the requirements of ASME Section XI was submitted and reviewed/approved by the NRC under 10 CFR 50.55a for use during the fourth inspection interval.

13) Alternative Requirements for Wall Thickness Restoration of Class 2 and 3 Carbon Steel Piping for Raw Water Service (Code Case N-661)

This alternative allows the use of Code Case N-661, "Alternative Requirements for Wall Thickness Restoration of Class 2 and 3 Carbon Steel Piping for Raw Water Service," in lieu of the requirements of ASME Section XI, Article IWA-4000. Paragraphs IWA-4221(a) and IWA-4221(b) of ASME Section XI require replacement or weld repair of wall thinning conditions for Class 2 and 3 carbon steel raw water piping systems to the design specification and original construction code. This alternative addresses external weld repair of wall thinning conditions in Class 2 and 3 carbon steel raw water piping systems. Use of Code Case N-661 provides additional time so pipe replacements can be planned to reduce impact on system availability and for availability of replacement materials. The NRC has reviewed Code Case N-661 for inclusion in a future revision of RG 1.147 (Proposed Revision 14, dated April 2004) and has established three conditions for its use. The use of Code Case N-661 with these three conditions provides reasonable assurance of structural integrity and an acceptable level of quality.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative involves corrective actions for wall thinning conditions in Class 2 and 3 carbon steel piping for raw water service and has no bearing on the aging management of systems and components within the scope of license renewal.

ASME SECTION XI, SUBSECTIONS IWE & IWL INSERVICE INSPECTION PROGRAM

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Section XI.S1, "ASME Section XI, Subsection IWE," and Section XI.S2, "ASME Section XI, IWL," are based on the 1992 edition through 1992 addenda of ASME Section XI as approved in 10 CFR 50.55a. The ASME Section XI, Subsections IWE & IWL Inservice Inspection Program (LRA Section B2.1.2) is also based on the 1992 edition through 1992 addenda of ASME Section XI, as modified by 10 CFR 50.55a.

The following alternatives to the requirements of ASME Section XI have been reviewed and approved by the NRC under 10 CFR 50.55a for use at PBNP Units 1 and 2 during the first inspection interval. The first inspection interval ends on September 9, 2006, prior to the period of extended operation for both PBNP Units 1 and 2. Those alternatives that have been determined to be aging management related and are exceptions to NUREG-1801 are justified below from an aging management point of view, in accordance with 10 CFR 54. Any future alternatives to ASME Section XI processed during the first inspection interval that are aging management related and exceptions to NUREG-1801 will be justified from an aging management point of view

and reviewed/approved by the NRC under 10 CFR 54, as well as 10 CFR 50.55a, before they are implemented.

The second inspection interval for both PBNP Units 1 and 2 will end on September 9, 2016, after entering the period of extended operation. The second inspection interval and subsequent intervals during the period of extended operation will use the edition and addenda of ASME Section XI required by 10 CFR 50.55a as reviewed and approved by the NRC staff for aging management under 10 CFR 54. Any alternatives to these future requirements that are aging management related and exceptions to NUREG-1801 will be justified from an aging management point of view and reviewed/approved by the NRC staff under 10 CFR 54, as well as 10 CFR 50.55a, before they are implemented.

1) Elimination of VT-3 Examinations of Seals and Gaskets

This alternative allows the leak-tightness of containment seals and gaskets to be tested in accordance with 10 CFR 50, Appendix J, Option B as required by ASME Section XI, Table IWE-2500-1, Examination Category E-P, Item E9.40 in lieu of the requirements of ASME Section XI, Table IWE-2500-1, Examination Category E-D, Items E5.10 and E5.20, which requires seals and gaskets to be VT-3 visually examined once each inspection interval to assure containment leak-tight integrity. Testing in accordance with 10 CFR 50, Appendix J, Option B provides adequate assurance of the leak-tight integrity of the containment seals and gaskets.

Performance of VT-3 examinations on containment airlock and certain electrical penetration seals and gaskets requires disassembly to gain access to the gaskets and seals. Without disassembly, most of the surface of the seals and gaskets would not be accessible. Disassembling components for the sole purpose of inspecting seals and gaskets does not offer a compensating increase in the level of quality and safety and imposes the risk that equipment could be damaged. Reasonable assurance of the functionality and integrity of the containment seals and gaskets is provided by the testing performed in accordance with 10 CFR 50, Appendix J, Option B, as provided in the ASME Section XI, Subsections IWE & IWL Inservice Inspection Program (LRA Section B2.1.2).

The 1998 edition of ASME Section XI recognized that disassembly of joints for the sole purpose of performing visual examinations is unwarranted and because of this, Examination Category E-D was modified to remove this requirement. The elimination of this visual examination requirement for containment seals and gaskets has also been reviewed and approved by the NRC staff for aging management under 10 CFR 54.

Conclusion

This alternative is not an exception to NUREG-1801. Reasonable assurance of the functionality and integrity of the containment seals and gaskets is provided by the testing performed in accordance with 10 CFR 50, Appendix J, Option B. In addition, the elimination of this visual examination requirement for containment seals and gaskets has been reviewed and approved by the NRC staff for aging management under 10 CFR 54. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.

2) No Successive Examination of Repairs

This alternative allows repairs of flaws in Class MC components to be evaluated and accepted in accordance with Article IWA-4000 without performing successive examinations in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) of ASME Section XI. The purpose of a repair is to restore the component to an acceptable condition for continued service in accordance with the acceptance standards of Article IWE-3000. Paragraph IWA-4150 requires an evaluation of the suitability of the repair, including consideration of the cause of the failure. If the repair has restored the component to an acceptable condition, successive examinations are not warranted. If the repair was not suitable, then the repair does not meet code requirements and the component is not acceptable for continued service. If the repair area is subject to accelerated degradation, it would still require augmented examination in accordance with Table IWE-2500-1, Examination Category E-C. In addition, neither Paragraphs IWB-2420(b), IWC-2420(b), nor IWD-2420(b) requires a repair to be subject to successive examination requirements.

SECY-96-080, Comment 3.3, was resolved as follows:

> "The purpose of IWE-2420(b) is to manage components found to be acceptable for continued service (meaning no repair or replacement at this time) as an Examination Category E-C component. If the component had been repaired or replaced, then more frequent examination would not be required."

As stated in the NRC/NEI meeting notes dated January 13, 1998, Item 7:

> "The staff believes that the successive examinations are required to monitor the flaws or degradation accepted by evaluation (and not by repair). For repaired flaws evaluated and accepted by the requirements of IWA-4000, the staff does not believe that successive examinations are necessary."

Successive exams in accordance with Paragraphs IWE-2420(b) and IWE 2420(c) are not required for repairs made in accordance with Article IWA 4000 in the 1998 edition of ASME Section XI. The elimination of the requirement to perform successive examination of repairs of flaws in Class MC components in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) has also been reviewed and approved by the NRC staff for aging management under 10 CFR 54.

Conclusion

This alternative is not an exception to NUREG-1801. A suitable code repair provides an acceptable level of quality and safety. In addition, the elimination of the requirement to perform successive examination of repairs of flaws in Class MC components in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) has been reviewed and approved by the NRC staff for aging management under 10 CFR 54. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.

3) Elimination of Required Bolt Torque or Tension Tests

ASME Section XI, Table IWE-2500-1, Examination Category E-G, Item E8.20, requires all Class MC pressure-retaining bolts that have not been disassembled and reassembled during the inspection interval to be torque or tension tested. Performing a torque or tension test requires the bolted connection to be loosened and then re-torqued or re-tensioned. This alternative allows the use of 10 CFR 50, Appendix J, Type B tests to demonstrate that a leak-tight seal exists and that the structural integrity of a bolted connection is maintained. 10 CFR 50, Appendix J, Type B testing ensures the pressure retaining bolting torque or tension has not changed significantly to have affected its leak-tight integrity and, therefore, additional torque or tension testing is not needed. All bolted connections meet the pressure test requirements of Table IWE-2500-1, Examination Category E-P, Items E9.30 and E9.40, requiring 10 CFR 50, Appendix J testing. Therefore, all pressure retaining bolted connections are routinely tested under the 10 CFR 50, Appendix J, Option B testing program, as provided in the ASME Section XI, Subsections IWE & IWL Inservice Inspection Program (LRA Section B2.1.2).

The requirement to perform bolt torque or tension tests has been removed in the 1997 addenda of ASME Section XI. In addition, Examination Category E-G is not included in the 1998 edition of ASME, Section XI. The elimination of the requirement to perform bolt torque or tension tests for all Class MC pressure-retaining bolts that have not been disassembled and reassembled during the inspection interval has also been reviewed and approved by the NRC staff for aging management under 10 CFR 54.

Conclusion

This alternative is not an exception to NUREG-1801. 10 CFR 50, Appendix J, Type B testing ensures the pressure retaining bolting torque or tension has not changed significantly to have affected its leak-tight integrity. In addition, the elimination of the requirement to perform bolt torque or tension tests for all Class MC pressure-retaining bolts that have not been disassembled and reassembled during the inspection interval has been reviewed and approved by the NRC staff for aging management under 10 CFR 54. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.

4) Elimination of the Need for Venting of Leak Chase Channels During Integrated Leak Rate Tests

ASME Section XI, Table IWE-2500-1, Examination Category E-P, Item E9.10, Note (2) requires that leak chase channels be unplugged or tested in accordance with 10 CFR 50, Appendix J, Type B. This alternative relies on 10 CFR 50, Appendix J, Type A testing to provide adequate assurance that the leak-tight integrity of the containment vessel is maintained, as provided in the ASME Section XI, Subsections IWE & IWL Inservice Inspection Program (LRA Section B2.1.2).

All containment leak chase channels are plugged with the test connections removed and visually inspected as part of the containment pressure boundary. The leak chase channels are qualified as an integral part of the containment liner plate. The as-built containment liner weld leak chase channels, which meet the intent of ASME Section III, are an integral part of the liner plate and, therefore, are a part of the leak tight containment pressure boundary. As such, it is not necessary to vent the containment liner weld leak chase channels during a containment integrated leak rate test.

Conclusion

This alternative is not an exception to NUREG-1801. 10 CFR 50, Appendix J, Type A integrated leak testing provides adequate assurance that the leak-tight integrity of the containment vessel and its leak chase channels is maintained. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.

5) Allowing the Qualification and Certification of NDE Personnel to a Written Practice in Accordance with SNT-TC1A Instead of CP-189

This alternative allows the examinations required by ASME Section XI, Subsections IWE and IWL to be performed with NDE personnel qualified and certified to a written practice based on SNT-TC-1A instead of CP-189. CP-189 is required by IWA-2300. Visual examination is the primary NDE method required by ASME Section XI, Subsections IWE and IWL. Neither CP-189 nor SNT-TC-1A specifically includes visual examination and, therefore, the code requires qualification and certification to comparable levels as defined in CP-189 or SNT-TC-1A, as applicable. In addition, ASME Section XI, IWA-2300 states: "Certification based on SNT-TC-1A are valid until recertification is required." PBNP currently qualifies and certifies NDE personnel in accordance with CP-189 as a result of NMC fleet standardization efforts.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is administrative in nature and has no bearing on the aging management of components within the scope of license renewal. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.

6) Relaxing the Illumination and Direct Examination Distance Requirements of IWA-2210

ASME Section XI, IWA-2210 and Table IWA-2210-1 impose minimum illumination and maximum direct examination distance requirements for the containment inspections required for Class CC components under IWL-2310. This alternative relaxes these requirements as long as conditions or indications for which the visual examinations are performed are detectable at the chosen distance and illumination.

Visual examinations of the concrete containment are performed to determine if damage or degradation, including cracks, wear, corrosion, erosion, or other physical damage, warrants additional evaluation or repair of the structure. Because of the nature of concrete, a concrete containment will have numerous small surface cracks and imperfections. These are due to shrinkage and are not detrimental to the structural integrity of the containment. Therefore, application of ASME Section XI, IWA-2210 and Table IWA-2210-1 requirements to identify these insignificant shrinkage-type cracks and imperfections is unnecessary.

Accessibility to higher portions of the containment building limits the ability to obtain the maximum direct examination distance and minimum illumination requirements of ASME Section XI, IWA-2210 and Table IWA-2210-1. The installation of extensive temporary scaffold systems or a climbing scaffold system

to access these portions of the containment would be necessary. These scaffolds would only provide limited access due to containment geometry restrictions as well as structural and equipment interferences. The installation and removal of these scaffolds would also increase worker radiation exposure and endanger personnel safety.

The NRC staff response to Comment 2.3 in Part III of Attachment 6A to SECY-96-080 states, in part, the following:

> "Comments received from ASME members, on the containment committees indicate that the newer, more stringent requirements of IWA-2210 were not intended to be used for the examination of containments and were inadvertently included in Subsection IWL. The NRC agrees that remote examinations are the only practical method for inspecting much of the containment surface area."

Conclusion

This alternative is not an exception to NUREG-1801. This alternative adequately ensures that conditions or indications that might impair containment integrity are detectable. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.

7) Allowing a General Visual Inspection of Inaccessible Concrete Surfaces Instead of the VT-3 Examination Required by IWL-2510(a)

ASME Section XI, IWL-2510(a) requires that containment concrete surface and tendon end anchorage areas be VT-3C visually examined for evidence of damage or degradation. This alternative allows a general visual examination of inaccessible concrete surfaces, excluding those areas exempted by IWL-1220, instead of the code required VT-3C visual examination. Accessible concrete surface areas, including coated areas and areas subjected to strains and pressures (e.g., penetrations, hatch areas), are VT-3C visually examined for evidence of conditions indicative of damage or degradation, as required by the code. Selected areas, such as those that indicate suspect conditions, receive a VT-1C examination in accordance with IWL-2310(a). Accessible areas are considered those areas where visual examinations can be performed from floors, roofs, platforms, walkways, ladders, ground surface, or other permanent vantage points. A VT-1C examination of the tendon end anchorages is also performed under Examination Category L-B, Item L2.30, as required by IWL-2521.

The conventional method of accomplishing a VT-3C examination on all concrete surface areas, including coated areas, with the exception of those exempted is by the use of remote visual magnification aids, such as binoculars or a spotting scope. This method of accomplishing a VT-3C examination on all required concrete and coated areas is not possible at PBNP because both the Unit 1 and

Unit 2 containment vessels are totally enclosed within a permanent facade structure. The facade structure prevents exposure of the containment concrete surfaces to environmental degradation effects due to wind, rain, snow, etc. However, the facade structure also prevents remote magnification inspections that many facilities are using to examine concrete areas that are inaccessible due to a lack of walkways, platforms, etc.

Performing VT-3C exams on all containment concrete surface areas does not provide a safety benefit commensurate with the risk to personnel required to perform these exams. It is more beneficial to focus the examination of concrete surfaces to the areas of high stress where degradation is expected to occur. These areas include tendon end anchorage areas, containment hatches, and penetrations. Penetration and hatch areas are accessible and, therefore, are VT-3C visually examined, as required by the code. A VT-1C examination of the tendon end anchorages is performed under Examination Category L-B, Item L2.30, as required by IWL-2521. Should an indication be discovered by an Examination Category L-B exam, IWL-3310 requires an evaluation of the extent, nature, and frequency of additional exams.

As provided in the ASME Section XI, Subsections IWE & IWL Inservice Inspection Program (LRA Section B2.1.2), inaccessible areas of concrete are evaluated for acceptability when conditions exist in accessible areas that could indicate the presence of or result in degradation to inaccessible areas. The extent of condition and corrective actions would be determined through the corrective action program. Therefore, performance of a general visual examination on inaccessible containment concrete surface areas provides reasonable assurance of containment integrity.

Conclusion

This alternative is not an exception to NUREG-1801. This alternative is acceptable, since inservice degradation is most likely to occur in accessible areas of high stressed concrete and inaccessible areas of concrete are evaluated for acceptability when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to inaccessible areas. As a result, any exceptions identified in LRA Section B2.1.2 based upon this alternative are withdrawn.