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Palisades Nuclear Plant
Operated by Nuclear Management Company, LLC

July 28, 2005

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U. S. Nuclear Regulatory Commission
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Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Response to NRC Requests for Additional Information Relating to License Renewal dated June 28, 2005

In letters dated June 28, 2005 (ML051790133, ML051790142, and ML051790157), the Nuclear Regulatory Commission (NRC) requested additional information regarding the License Renewal Application for the Palisades Nuclear Plant. This letter responds to those requests.

Enclosures 1, 2, and 3 provide the text of, and the NMC response to, each NRC request.

Please contact Mr. Darrel Turner, License Renewal Project Manager, at 269-764-2412, or Mr. Robert Vincent, License Renewal Licensing Lead, at 269-764-2559, if you require additional information.

Summary of Commitments

This letter contains no new commitments or changes to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 28, 2005.

Paul A. Harden
Site Vice President, Palisades Nuclear Plant
Nuclear Management Company, LLC

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Enclosures (3)

CC Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
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ENCLOSURE 1

**NMC Responses to NRC Requests for Additional Information (ML051790133)
Dated June 28, 2005**

(3 Pages)

Enclosure 1
NMC Responses to NRC Requests for Additional Information (ML051790133)
dated June 28, 2005

RAI 3.5.2-1-1

In Table 3.5.2-1 (Page 3-311), under the component type "Flood Barrier-Carbon Steel, Protected," PNP's Structural Monitoring Program is credited to manage the loss of leak tightness aging effect of flood doors. The Structural Monitoring Program is also credited to manage the loss of leak tightness effect in: (1) HELB doors (Table 3.5.2-1, Page 3-313); (2) Control room vestibule door (Table 3.5.2-2, Page 3-314); (3) Flood doors and hatch (Table 3.5.2-10, Page 3-389); and (4) Control room vestibule door (Table 3.5.2-10, Page 390). Summarize past PNP's operating/inspection experience in managing the leak tightness of the above listed PNP components, and discuss specific provision(s) of the Structural Monitoring Program that are intended to maintain the leak tightness junction of the PNP components.

NMC Response to NRC RAI 3.5.2-1-1

For the flood doors, hatch, and High Energy Line Break / Moderate Energy Line Break doors, the Structural Monitoring Program credits an existing watertight barrier inspection procedure, MSM-M-16, "Inspection of Watertight Barriers". The watertight barrier inspection procedure is currently performed on a yearly basis on all watertight barriers as well as twice every refueling outage on high use doors. Parameters inspected include seals (including performance of a chalk test), loose or missing parts, latch tightness, etc. A review of work order history identifies instances where the program has found barrier seals that failed chalk tests and latches that were discovered to be loose. Repairs were made and the barriers were retested satisfactorily.

For the control room vestibule doors, the Structural Monitoring Program credits Palisades' monthly Technical Specification Test MO-33, "Control Room Ventilation Emergency Operation". One of the acceptance criteria is to ensure the control room pressure readings are equal to or greater than 0.125 inches of water as required by Technical Specification Surveillance Requirement SR 3.7.10.4. Review of action requests indicates that this test has found and repaired a degraded vestibule door closing mechanism that had impacted its leak tightness.

RAI 3.5.2-2-1(a)

Table 3.5.2-2 (Page 3-318) of the LRA credits ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Programs to manage loss of material aging effect of Auxiliary Building cast iron components (ASME Class 2 & 3 Piping & Mechanical Component Support). Table 3.5.2-2 (Page 3-336) of the LRA credits Structural Monitoring Program to manage loss of material aging effect of Discharge Structure Cast Iron components (Non-ASME Piping & Mechanical Component Support). Note 582 referred to by the tables states that cast iron is considered consistent with carbon steel and is evaluated the same, but with the additional aging effect/mechanism of loss of material due to selective leaching also evaluated. Discuss PNP's past operating experience and inspection results related to selective leaching of PNP's in-scope cast iron components. Did any of these affected cast iron components experience cracking or loss of function as a result of leaching? If yes, summarize PNP's corrective action(s) taken to dispose the identified aging degradation.

NMC Response to NRC RAI 3.5.2-2-1(a)

The ASME and Non-ASME Cast Iron components in question are pump support skids located in the Auxiliary Building and in the Warm Water Recirculation Pump House above the Discharge Structure. Both are in an indoor air environment. As indicated in note 582, both sets of components were evaluated for loss of material due to selective leaching. The results of those evaluations are that loss of material due to selective leaching does not apply to these components in their plant indoor air environment. Thus, the ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program and the Structural Monitoring Program are only being credited for age managing loss of material due to general corrosion, not for loss of material due to selective leaching.

Where loss of material due to selective leaching does apply, namely in a wetted environment, the One Time Inspection Program is the appropriate program to manage the aging effect. Since the One Time Inspection Program is a new program (see LRA Section B2.1.13), there is no operating experience or inspection results related to selective leaching on in-scope cast iron components.

It was noted, however, while reviewing the structural component types where loss of material due to selective leaching does apply in LRA Tables 3.5.2-5 (page 3-349) and 3.5.2-7 (page 3-355), the One Time Inspection Program was not listed. These line items should have credited the One Time Inspection Program for the aging management of loss of material due to selective leaching, in addition to the Structural Monitoring Program for management of other loss of material mechanisms. The resulting line item revisions are provided below. The existing table line item is shown in gray. The added information is shown in bold text.

Enclosure 1
NMC Responses to NRC Requests for Additional Information (ML051790133)
dated June 28, 2005

Line Item Change for Discharge Structure Table 3.5.2-5 on page 3-349

Building Framing – Cast Iron, Raw Water (sluice gates)	Structural Support for Non-Safety Related	Cast Iron	Raw Water (Ext.)	Loss of Material	Structural Monitoring	III.A6.2-a	3.5.1-22	580, 582. A
				Loss of Material – Selective Leaching	**One-Time Inspection**	**III.A6.2-a**	**3.5.1-22**	**580, 582. H**

Line Item Change for Intake Structure Table 3.5.2-7 on page 3-355

Building Framing – Cast Iron Raw Water (sluice gates)	Structural Support for Regulated Events Structural Support for Safety Related	Cast Iron	Raw Water (Ext.)	Loss of Material	Structural Monitoring	III.A6.2-a	3.5.1-22	580, 582. A
				Loss of Material – Selective Leaching	**One-Time Inspection**	**III.A6.2-a**	**3.5.1-22**	**580, 582. H**

ENCLOSURE 2

NMC Responses to NRC Requests for Additional Information (ML051790142) Dated June 28, 2005

(2 Pages)

RAI 3.5.2-4-1

In Table 3.5.2-4, under the component type "concrete protected," a number of structural components (e.g.,masonry walls, RC beams, columns, pedestals) are listed. It would be logical to have primary shield walls, secondary shield walls, and reactor pressure vessel (RPV) supports included under this component type. Section 3.5.2.2.2.1 describes the elevated temperature situation around the reactor vessel, and justifies the existence of the elevated temperatures in these areas, based on the estimated temperatures in the Palisades FSAR. The applicant is requested to provide the following information related to this component type.

RAI 3.5.2-4-1(a)

Please provide the operating experience related to the effectiveness of the "shield cooling system." Are the shield wall temperatures, or any other parameter monitored, that would detect the malfunctioning of the cooling system?

NMC Response to NRC RAI 3.5.2-4-1 and 3.5.2-4-1(a)

In the 1995 Refueling Outage, an array of temperature monitoring devices was installed in the annulus between the reactor vessel and the biological shield wall. Ten of these devices were installed on the shield wall itself. Measurements showed temperatures ranging between 164°F and 202°F at the shield wall steel liner plate. These measured temperatures were used as input to the development of the revised biological shield wall temperature profiles shown in FSAR Figures 9-3, 9-4, 9-5 and 9-6. The results of this benchmarking analysis showed that the structural concrete in the biological shield wall remained below 165°F.

Shield wall temperatures are not continuously monitored. However, the shield cooling water temperatures are monitored and will alarm in the control room when temperature reaches 120°F. Follow up actions to the alarm include commencing a plant shutdown if the alarm cannot be cleared and shield cooling return temperature exceeds 165°F. Similarly, shield cooling pump breakers are monitored and, should both shield cooling pumps trip, commencement of a plant shutdown is directed.

RAI 3.5.2-4-1(b)

Based on the discussion of the elevated temperature condition, in and around the primary shield wall in Section 3.5.2.2.2.1, the staff agrees with EPRI TR-103842, that the concrete properties will not be significantly affected, if the actual temperatures around the shield wall remain within the estimated limits. However, additional shrinkage and loss of moisture due to radiation could degrade the concrete on a long term basis. In this context, please provide a summary of the results of the last two inspections performed for: (1) the primary shield wall, (2) RPV supports, (3) grouted anchorages, and (4) masonry walls inside the containment.

NMC Response to NRC RAI 3.5.2-4-1(b)

1 & 2) No inspection results are available. As discussed in section 2.4.4 of the LRA, the entire interior concrete surface of the Palisades Primary Shield Wall is lined with welded carbon steel plate. This includes the area around the reactor pressure vessel (RPV) supports. Accordingly, the shield wall concrete and the concrete around the RPV supports are not accessible for inspection.

3) The term "grouted anchorage" in the description of "Building Framing - Containment Cavity" in LRA Table 2.4.4-1 is used generically. The specific anchorage in the vicinity of the reactor shield wall is cast-in-place bolting or strap anchors, depending on elevation, for the liner plate. These anchors are not accessible for inspection.

4) There is one block wall inside containment on the 649' level, which is remote from the high temperature and radiation environment of the shield wall. Structural Monitoring Program inspections were performed inside containment in 1996 and 1999. The top five courses of masonry wall blocks were found spalled at the northern most tip of the block wall. The existing condition was determined not to be damaging to the masonry wall integrity, which serves only as a partition wall. The condition was deemed acceptable as-is.

It should be noted that the concrete shielding blocks in the primary coolant pipe openings of the shield wall that are mentioned in LRA Section 3.5.2.2.2.1 are not masonry walls. These removable concrete blocks are held in place by external restraints without mortar, and are not inspected or evaluated as block walls.

ENCLOSURE 3

NMC Responses to NRC Requests for Additional Information (ML051790157) dated June 28, 2005

(12 Pages)

RAI A2.3-1

On Page A-3 of the LRA, the first two sentences in Section A2.3, Bolting Integrity Program, are not consistent with the FSAR Supplement in NUREG-1800 (e.g., Page 3.1-23). Please clarify.

NMC Response to NRC RAI A2.3-1

The summary program description on LRA page A-3 is intended to describe the Palisades Bolting Integrity Program for all systems and components in the scope of License Renewal. This description is intended to encompass the requirements for bolting integrity described in NUREG-1800 page 3.3-17, 3.4-11, 3.5-19, 3.2-12 as well as 3.1-23. Because there are slight differences in the various bolting program descriptions in NUREG 1800, the Palisades program was more generally described in a way that was intended to be consistent with all the NUREG 1800 descriptions. In addition, since the Palisades Bolting Integrity Program addresses structural bolting as well as pressure retaining bolting, NMC did not limit the Palisades program scope by including the words "pressure retaining bolting" that appear in each NUREG-1800 description. Finally, the reference to "enhanced inspection techniques" in NUREG 1800 is not clearly coupled to the GALL NUREG 1801 XI.M18 "Bolting Integrity" program description, so this statement was not considered relevant to the Palisades program description.

Since the Palisades Bolting Integrity Program is consistent with the NUREG 1801, XI.M18, program description, it is concluded that its content is consistent with the description on page 3.1-23 of NUREG 1800.

RAI B2.1.3-1

On Page B-25 of the LRA, the applicant states that the Structural Monitoring Program in LRA Section B2.1.19 is credited for the Palisades' Bolting Integrity Program. On Page B-29, the applicant states that structural bolting and fasteners are inspected visually in accordance with the Structural Monitoring Program. However, bolting is not discussed in the Structural Monitoring Program. Please clarify why the Structural Monitoring Program is credited for the Bolting Integrity Program when bolting is not explicitly discussed in the Structural Monitoring Program.

NMC Response to NRC RAI B2.1.3-1

While the summary description of the Structural Monitoring Program in LRA B2.1.19 does not explicitly mention bolting, bolting is included in the program scope. The program basis documentation for the Palisades Structural Monitoring Program specifically states that structural bolting is inspected for indications of potential problems including loss of coating integrity and obvious signs of corrosion, rust, etc.

RAI B2.1.3-2

On Page B-25 of the LRA, the applicant states that the system monitoring program in LRA Section B2.1.20 is credited for the Bolting Integrity Program; however, bolting is not mentioned in the system monitoring program. (1) Please clarify why the system monitoring program is credited for the Bolting Integrity Program when bolting is not discussed in the system monitoring program; (2) Under the system monitoring program, the applicant inspects piping systems visually to determine leakage during walkdowns. Most piping systems are covered with insulation. Discuss how bolting integrity (e.g., cracking, loss of preload, and loss of material due to corrosion) would be determined when bolts are covered with insulation.

NMC Response to NRC RAI B2.1.3-2

(1) Although Bolting is not specifically discussed in the LRA description of the Palisades System Monitoring Program, bolting is a component that will be inspected by the program. The intent of the System Monitoring Program is to inspect all accessible external surfaces of various component types (e.g., pump casings, valve bodies, piping, expansion joints), which would include bolted connections.

(2) NMC will not remove insulation solely for the inspections performed by the System Monitoring Program. Removal of insulation is not considered necessary to identify likely locations of potential degradation. The condition of the insulation (e.g., discoloration, evidence of wetting, etc.), in itself, provides a good indirect indicator of the conditions beneath. If the insulation condition indicates that a potential problem exists beneath the insulation, this condition would be documented and corrective action (e.g., isolation, insulation removal, further inspection, repairs) would be initiated.

The Palisades system walk downs will look for evidence of degradation where pipe insulation is not removed in a manner similar to the ASME Code for safety-related piping and components. The inspection performed under the Palisades System Monitoring Program of insulated non-Class 1 pipe and closure joints will be similar to the visual examinations, VT-2, prescribed by the ASME Code for insulated Class 1 piping and pressure retaining bolted connections. ASME Section XI, Paragraph IWA-5242, Insulated Components, states, (a) For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for visual examination VT-2. For other components, visual examination VT-2 may be conducted without the removal of insulation by examining the accessible and exposed surfaces and joints of the insulation. Essentially vertical surfaces of insulation need only be examined at the lowest elevation where leakage may be detected. Essentially horizontal surfaces of insulation shall be examined at each insulation joint. (b) When examining insulated components, the examination of surrounding area (including floor areas or equipment surfaces located underneath the components) for evidence of leakage, or other areas to which such leakage may be channeled, shall be required. (c) Discoloration or residue on surfaces examined shall be given particular attention to detect evidence of boric acid accumulation from borated reactor coolant leakage.

Management of loss of bolting pre-load is addressed by maintenance and installation procedures. Loss of material due to corrosion will be identified by discovering the evidence of leakage prior to a loss of intended function. For cracking to occur three conditions must be present: high stress, a corrosive environment, and susceptible material. A corrosive environment is precluded through use of proper lubricants, and proper bolt torquing practices. Should leakage occur, the evidence of the leak would be discovered, investigated and resolved prior to a loss of intended function.

RAI B2.1.3-3

On Page B-25 of the LRA, the applicant states that the ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection (ISI) program in LRA Section B2.1.2 is credited for the Bolting Integrity Program. The ASME Section XI specifies periodic inservice examination on a sampling basis. Please clarify whether all bolts in the Palisades plant that are covered under the LRA will be examined before entering extended period of operation. If not, provide a percentage of bolts that will be examined per the ISI program before entering extended period of operation and discuss whether this percentage is sufficient to show bolting integrity of the entire bolting population.

NMC Response to NRC RAI B2.1.3-3

On page B-25 of the LRA, NMC states that the bolting integrity program credits activities performed under three separate aging management programs for the inspection of bolting. The three aging management programs are: (1) ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection (ISI) program, (2) Structural Monitoring Program, and (3) System Monitoring Program.

On page B-26 of the LRA, NMC describes the scope of the credited programs for bolting as:

- The ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program provides the requirements for inservice inspection of ASME Class 1, 2, and 3 piping, supports, and their integral attachments, which includes pressure retaining and support bolting. This program specifically discusses the inspection and lubrication of the reactor vessel head closure studs. The program supplements the ASME Section XI (Code Case N491-2), Subsection IWF requirements, by applying the inspection requirements of Subsection IWB, Category B-G-1 to high yield strength (>150 ksi) bolting used in Nuclear Steam Supply System (NSSS) component supports.

- The System Monitoring Program provides the requirements for the inspection of non-safety related bolting within the scope of license renewal.

- The Structural Monitoring Program provides the requirements for the inspection of all structural bolting within the scope of license renewal. Other bolting and fasteners are also included within the scope of this program, such as those used in supports for cable trays, conduits and cabinet supports.

All ASME class 1, 2, and 3 bolting is inspected by the ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program a minimum of once each ten year inspection interval. ASME Section XI, Table IWB-2500-1 requires inspection of bolts, studs, and nuts for various class 1 components. In all cases, the inspection requirement encompasses all bolts, studs, and nuts each inspection interval. There is no provision for a sampling size. ASME Section XI, Table IWC-2500-1 requires inspection of 100 percent of bolts and studs of size two inch and greater at each bolted connection in class 2 components.

IWC-2500-1 also requires a visual VT-2 examination of all pressure retaining components during a system leakage test. The leakage test is required each inspection period. ASME Section XI, Table IWD-2500-1 requires a visual VT-2 examination of the pressure retaining boundary of class 3 systems during a system leakage test each inspection period.

Non-ASME classed bolting within the scope of license renewal that is reasonably accessible for external visual inspection will be periodically inspected under either the System Monitoring Program (system walkdowns) or the Structural Monitoring Program (general area inspections).

Each of these programs currently exists. The LRA includes commitments for certain enhancements to make each program an effective aging management program. Enhancements to the bolting integrity program will be implemented prior to the period of extended operation. Upon completion of the identified enhancements, all bolting requiring aging management for license renewal will be included in an appropriate aging management program, and a sufficient percentage of the total population will be accessible for inspection to provide reasonable assurance that bolting condition is adequate.

RAI B2.1.3-4

On Page B-26 of the LRA, the applicant states that the attributes of the Bolting Integrity Program are adequate to manage loss of preload without hot torquing; therefore, hot torquing to establish a preload will not be credited for aging management of bolting. The applicant needs to explain in detail which attributes of the Bolting Integrity Program are adequate to manage loss of preload without hot torquing.

NMC Response to NRC RAI B2.1.3-4

Consistent with the recommendations in EPRI TR-104213s, Bolted Joint Maintenance and Applications Guide, NMC has assessed the various aspects of proper preloading practices, including the potential benefits versus risks of hot torquing. Based on these considerations, it has been concluded that Palisades' fastener preload practices and procedures are sufficient to assure bolted joint integrity without the inclusion of hot torquing requirements. Several key attributes of those practices and procedures are described below.

Palisades' fastener preload procedures include instructions for preparation of joints and predetermination of fastener size, material, thread lubricant and design temperature. Yield strength, thread stress areas and nut factors are determined. Final torque, maximum torque and torque for each pass is calculated. Torque is generally applied in a minimum of four passes, and measured during the sequence. Gasket compression thicknesses are determined as part of the preload procedure. Gaskets are crushed progressively, in stages, and standard bolt patterns are used to crush gaskets uniformly.

Therefore, the combination of the maintenance and installation practices and the periodic inspections conducted under the Bolting Integrity Program are sufficient to manage loss of bolting preload.

RAI B2.1.3-5

On Page B-26 of the LRA, the applicant states that "...The Bolting Integrity Program is consistent with NUREG-1801, Section XI.M18, Bolting Integrity." The applicant also states that -2- "...Two enhancements are planned to bring the Bolting Integrity Program into conformance with the NUREG-1801 program description..." These two statements seem to contradict each other. Please clarify.

NMC Response to NRC RAI B2.1.3-5

These statements are not inconsistent. LRA Section B1.1, Overview and Methods of Discussion, discuss the NMC philosophy applied to the LRA concerning enhancements and exceptions to NUREG 1801 program descriptions. LRA page B-1 states, "Program enhancements are identified for some of the existing programs that will bring the programs into conformance with NUREG 1801. Each program in this appendix is described as if the identified enhancements have been implemented."

All the enhancements identified in the LRA Appendix B program descriptions have also been listed as commitments in the LRA transmittal letter.

RAI B2.1.3-7

On Page B-28 of the LRA, the applicant states that normal maintenance practices and quality verification procedures for pressure retaining bolting includes a check of bolt torque and uniformity of gasket compression. Discuss whether there are similar procedures to verify the torque of structural bolting.

NMC Response to NRC RAI B2.1.3-7

There are similar procedures to verify the torque of structural bolting. MSM-M-45, "Removal, Installation, and Repair of Pipe Supports" provides criteria for proper torquing or retorquing of bolted connections related to pipe supports. MSM-M-44, "Hilti Bolt Installation and Inspection" provides instructions for installation and or retorquing of the HILTI brand Drop-In anchors, and installation and or retorquing of the HILTI brand Kwik Bolt II Anchors. Hilti Drop-in Anchors are used for mounting small items. Hilti Kwik Bolt II Anchors may be used for piping , cable tray, HVAC, and small equipment supports as well as electrical components and instrumentation. Torquing requirements for new construction or modifications would not necessarily be covered by permanent plant maintenance procedures, but would be specified in new construction specifications or drawings. Finally, procedure MSM-M-48 "Standard Torque Tables" is applied to fasteners in standard bolting applications on pressure retaining components, and it is available for use in structural applications in the absence of other guidance.

RAI B2.1.3-8

On Page B-30 of the LRA, the applicant states that MC component support bolting is evaluated in accordance with the acceptance standards of ASME Code Case N-491-2, Section 3410. GALL XI.M18 recommends immediate replacement of the cracked bolt when indications of cracking is found in support bolting. Code Case N-491-2 provides guidance on examination and acceptance criteria, but it does not specify replacement. Discuss whether the Bolting Integrity Program has a process by which a cracked bolt will be replaced immediately.

NMC Response to NRC RAI B2.1.3-8

If a degraded bolt is identified, the condition would be entered into the plant Corrective Action Program. The program, in turn, would require a prompt assessment of the effect of the condition on equipment operability and plant safety. Corrective actions would be assigned and completed commensurate with the safety and operational significance of the condition. The corrective action for a degraded bolt would likely include eventual replacement of that bolt, but the timing of the replacement would have to consider the safety-significance of the condition, the plant conditions needed to safely complete the work, the status of other plant equipment, the extent and complexity of repair, radiological conditions, availability of replacement parts, etc.

The most prudent action, therefore, could include immediate replacement as emergency maintenance; or it could involve such things as isolation of the affected bolted joint from operating systems, analysis to verify adequate pressure boundary or structural integrity, later replacement using normal maintenance planning and scheduling procedures, etc. The timing and nature of any actions to be taken would be planned and managed under the corrective action process in a way that best assures the safety of the public, plant workers, and plant equipment.

RAI B2.1.3-9

On Page B-30 of the LRA, the applicant states that "...Palisades Bolting Integrity Program makes no distinction regarding "immediate' repairs, but instead relies upon the plant inservice inspection program and corrective action process to evaluate, prioritize and schedule repairs..." GALL XI.M18 recommends that immediate repairs be performed for major leaks that may cause corrosion or contamination. Explain whether major leaks that are caused by degraded bolting will be repaired immediately, including bolting replacement.

NMC Response to NRC RAI B2.1.3-9

If a major leak were to occur that had a significant impact on plant equipment or plant safety, operators would take prompt action in accordance with procedures to bring the plant to a safe, stable condition. The leaking joint would be isolated if practical, or the plant could even be shut down and depressurized, if warranted. Actions for such a severe condition would not be delayed for administrative processing of corrective action documents, etc. Longer term repairs and recovery actions would be managed under the corrective action program.

Whether or not immediate operational actions are taken, degraded conditions would be entered promptly into the plant Corrective Action Program. The program, in turn, would require a prompt assessment of the effect of the condition on plant safety and equipment operability. Corrective actions would be assigned and completed commensurate with the safety and operational significance of the condition. The corrective action for a degraded bolt would likely include eventual replacement of that bolt, but the timing of the replacement would have to consider the safety-significance of the condition, the plant conditions needed to safely complete the work, the status of other plant equipment, the extent and complexity of repair, radiological conditions, availability of replacement parts, etc.

The most prudent action, therefore, could include immediate replacement as emergency maintenance; or it could involve such things as isolation of the affected bolted joint from operating systems, analysis to verify adequate pressure boundary or structural integrity, later replacement using normal maintenance planning and scheduling procedures, etc. The timing and nature of any actions to be taken would be planned and managed under the corrective action process in a way that best assures the safety of the public, plant workers, and plant equipment.

RAI B2.1.3-10

On Page B-31 of the LRA, the applicant states that the Bolting Integrity Program has been effective in identifying six instances of bolting degradation at Palisades in a timely manner. (1) Discuss how the six instances of bolting degradation were dispositioned; (2) Discuss how the six instances of bolting degradation were detected (e.g., by routine maintenance, system walkdown, or leakage monitoring system); and (3) Describe degradation mechanism(s) of each of the six instances in question.

NMC Response to NRC RAI B2.1.3-10

There were two instances of corrosion of components in the Condensate Storage Tank, valve pit. A Corrective Action document was initiated after corrosion was identified on carbon steel flanges during a valve line-up by operations. Another Corrective Action document was initiated by engineering due to corroded bolts in a flange that were discovered during a walk down in the valve pit. In both instances, the components were replaced. Both of these instances were due to the unventilated damp environment within the pit.

There were two Corrective Action documents initiated concerning boric acid wastage of Primary Coolant Pump flange bolts. This was discovered by System Engineering during walk down. The boric acid was removed and an engineering evaluation of the bolts was performed. The evaluation confirmed that the Primary Coolant Pumps remained operable (i.e., integrity was not compromised by the limited degradation of the bolting material). The degraded bolts were subsequently replaced during the next refueling outage.

In addition to database searches, the Palisades License Renewal Project solicited operating experience from plant equipment experts. Specifically, plant experts were asked, "What comments or documents would you suggest adding to the [Palisades OE] database to highlight recurring aging issues that we might need to address in our Aging Management Programs"? There were two bolting-related responses to this question from system owners. One system engineer identified the possibility of fatigue of pipe supports, and another engineer identified the potential for boric acid wastage of Engineered Safeguards System bolting material. Since both of these concerns were non-specific, and were being addressed by a combination of TLAAs and Aging Management Programs, no further action was required. No new aging mechanisms nor failures of aging management programs were identified.