

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B.2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program

Preventive Actions (ISG-17XLE4)

No information is provided in Non-Segregated Phase Bus and Connections AMP. Provide this element

Final Response: See page 5 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

A new bullet, Non-Segregated Phase Bus and Connections, has been added under Preventive Actions in response to this question.

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☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: B.2.2.12 Non-EQ Electrical Commodities Condition Monitoring Program

Detection of Aging Effects (ISG-17 XLE4)

Address the detection of aging effects element for Non-Segregated Phase Bus and Connection AMP

Final Response: See response to B2.1.12-015 6/21/05

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☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B.3.1 Electrical Equipment Qualification

Program Description

Provide EQ Component Reanalysis Attributes

Final Response:

LRA section B3.1, Program Description, on page B-160, is hereby revised to add the following:

☐ EQ Component Reanalysis Attributes (NUREG-1801 X.E1)

The reanalysis of an aging evaluation is normally performed to extend the qualification by reducing excess conservatism incorporated in the prior evaluation. Reanalysis of an aging evaluation to extend the qualification of a component is performed on a routine basis pursuant to 10 CFR 50.49(e) as part of an EQ program. While a component life limiting condition may be due to thermal, radiation, or cyclical aging, the vast majority of component aging limits are based on thermal conditions. Conservatism may exist in aging evaluation parameters, such as the assumed ambient temperature of the component, unrealistically low activation energy, or in the application of a component (de-energized versus energized). The reanalysis of an aging evaluation is documented according to the station's quality assurance program requirements, which requires the verification of assumptions and conclusions. As already noted, important attributes of a reanalysis include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions (if acceptance criteria are not met). These attributes are discussed below.

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Analytical Methods: The analytical models used in the reanalysis of an aging evaluation are the same as those previously applied during the prior evaluation. The Arrhenius methodology is an acceptable thermal model for performing a thermal aging evaluation. The analytical method used for a radiation aging evaluation is to demonstrate qualification for the total integrated dose (that is, normal radiation dose for the projected installed life plus accident radiation dose). For license renewal, one acceptable method of establishing the 60-year normal radiation dose is to multiply the 40-year normal radiation dose by 1.5 (that is, 60 years/40 years). The result is added to the accident radiation dose to obtain the total integrated dose for the component. For cyclical aging, a similar approach may be used. Other models may be justified on a case-by-case basis.

Data Collection and Reduction Methods: Reducing excess conservatism in the component service conditions (for example, temperature, radiation, cycles) used in the prior aging evaluation is the chief method used for a reanalysis. Temperature data used in an aging evaluation is to be conservative and based on plant design temperatures or on actual plant temperature data. When used, plant temperature data can be obtained in several ways, including monitors used for technical specification compliance, other installed monitors, measurements made by plant operators during rounds, and temperature sensors on large motors (while the motor is not running). A representative number of temperature measurements are conservatively evaluated to establish the temperatures used in an aging evaluation. Plant temperature data may be used in an aging evaluation in different ways, such as (a) directly applying the plant temperature data in the evaluation, or (b) using the plant temperature data to demonstrate conservatism when using plant design temperatures for an evaluation. Any changes to material activation energy values as part of a reanalysis are to be justified on a plant-specific basis. Similar methods of reducing excess conservatism in the component service conditions used in prior aging evaluations can be used for radiation and cyclical aging.

Underlying Assumptions: EQ component aging evaluations contain sufficient conservatism to account for most environmental changes occurring due to plant

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modifications and events. When unexpected adverse conditions are identified during operational or maintenance activities that affect the normal operating environment of a qualified component, the affected EQ component is evaluated and appropriate corrective actions are taken, which may include changes to the qualification bases and conclusions.

Acceptance Criteria and Corrective Actions: The reanalysis of an aging evaluation could extend the qualification of the component. If the qualification can not be extended by reanalysis, the component is to be refurbished, replaced, or requalified prior to exceeding the period for which the current qualification remains valid. A reanalysis is to be performed in a timely manner (that is, sufficient time is available to refurbish, replace, or requalify the component if the reanalysis is unsuccessful).

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B.3.1 Electrical Equipment Qualification

Monitored/Inspected

Provide details of monitoring or inspection of component parameters to ensure that a component is within bounds of its qualified or as a mean to modify the qualified life during the extended period of operation

Final Response:

The current EQ program monitors temperature as necessary to ensure the calculations are conservative, or as a means to modify the qualified life during the extended period of operation.

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☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: B.3.1 Electrical Equipment Qualification

Acceptance Criteria

How actual operating environment is determined

Final Response: The current program monitoring operating environments will continue for the period of extended operation. 6/21/05

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☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B3.2-001

Identify the preventive measures that mitigate fatigue cracking.

CLARIFICATION: In the scope attribute of the GALL FM program, the staff suggests the following:

The program includes preventive measures to mitigate fatigue cracking of metal components of the reactor coolant pressure boundary caused by anticipated cyclic strains in the material.

Identify the preventive measures that mitigate fatigue cracking.

Final Response:

The Palisades Fatigue Monitoring Program includes preventive measures designed to mitigate fatigue cracking of the metal components of the reactor coolant pressure boundary caused by cyclic strains in the materials. Preventive measures are consistent with the aging management program recommended in NUREG 1801 Section X.M1.

The Fatigue Monitoring Program monitors plant transients that have been identified as causing cyclic strains that contribute significantly to the cumulative usage fatigue factor. Using inputs from plant instrumentation to define the transients, the thermal transient cycles are counted. If it becomes necessary, a computer program will be employed to update the cumulative usage factor calculations for viewing, trending and evaluation.

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Status: Closed - Response Docketed

Information Request: B3.2-002

Identify the basis for selection of locations subject to local monitoring, especially those that may be more limiting than those identified in NUREG/CR-6260 and those that are identified subsequently.

Final Response:

The locations defined in NUREG/CR-6260 were considered during the development of the program, but represent only about one third of the Palisades components being monitored. The most limiting Palisades locations identified during program development were also evaluated for monitoring. The Palisades program includes the most limiting locations that warrant either cycle counting or stress-based monitoring.

The criterion for selecting monitored locations is based on the following:

- ☐ Only locations with a design basis fatigue usage factor greater than 0.40 were considered. The cutoff value of 0.4 is somewhat arbitrary, but was selected to ensure at least a 50% margin on design basis cumulative fatigue usage for a potential 60-year operating period (i.e., $1.5 \times 0.4 = 0.60$, which has greater than 50% margin compared to an allowable value of 1.0).
- ☐ Field experience that suggests a fatigue concern may exist.

The term local monitoring does not necessarily imply direct monitoring of the location of concern. In cycle-based fatigue monitoring like that used at Palisades, the actual data being used to define specific thermal transients may be coming from locations that are physically separated from the location of concern. The term local monitoring is interpreted to mean identification of a location of interest for either cycle counting or stress-based monitoring.

As stated in LRA Section B3.2 on page B-168, Palisades has a comprehensive Operating Experience Program (OEP) that monitors industry issues/events and assesses these for applicability to its own operations. In addition, the Palisades Corrective Action Program (CAP) is used to track, trend and evaluate plant issues/events. Those issues and events, whether external or plant specific, that are potentially significant to the Fatigue Monitoring Program at Palisades will be evaluated. The Fatigue Monitoring Program will be augmented, as appropriate, if these evaluations show that program changes or monitoring of additional locations will enhance program effectiveness. Using the OEP and CAP to focus on industry and plant operating experience ensures that Fatigue Monitoring Program issues are addressed in a timely manner and that age related deterioration of SSC within the scope of the Fatigue Monitoring Program will be effectively managed throughout the license renewal period.

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Status: Closed - Accepted by Auditor

Information Request: B3.2-003

Identify the basis for choosing or changing the parameters monitored (e.g., to perform BF vs. CBF) and the commitment to apply SBF when those criteria are met.

B3.2-003a

CLARIFICATION: The LRA does not describe the FM program the basis for using SBF vs. CBF for a particular location

Final Response:

Palisades has not committed to use stress-based fatigue (SBF) monitoring as part of the program described in the LRA. It is only a capability of the computer-based monitoring software that could be available if a particular location became problematic to the degree that more localized monitoring was required.

Because Palisades does not currently plan to use the stress-based capability of the fatigue monitoring program, no specific criteria has been established to shift from cycle-based to stress-based monitoring. Palisades has committed to monitor thermal fatigue and take corrective action if trends indicate that the CUF will exceed 1.0 during the extended period of operation. These actions may include reevaluation, closer monitoring (with SBF as an example), repair or replacement. The methods employed will be dependent upon the circumstances at that time, as the number of variables makes it impractical to develop comprehensive criteria at this time.

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B3.2-004

Clarify the meaning of "should not exceed" or similar expression when referring to a CUF <1.0 (whether or not it constitutes a commitment to a particular acceptance criterion)

Final Response:

This question appears to be directed specifically at the statement on page 4-17 of the application, which reads, "Therefore the CUF should not approach 0.5 in 60 years..." In this instance, it is not a commitment to use 0.5 or any value less than 1.0 as the acceptance criterion. This was a conclusion that could have been stated as "...will not approach..." or, "...is not expected to approach ..."

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☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B3.2-005

Confirm that non-design-basis transients will be addressed prior to the period of extended operation. (In other words, commit to determination of values presented as "TBD".)

B3.2-005a

CLARIFICATION: Confirm that non-design-basis transients will (vice "may") be addressed prior to the period of extended operation.

Final Response:

As indicated in the LRA Section B3.2, Scope of Program, on page B-165, non-design basis transients have already been included in the development of the Fatigue Monitoring Program. The design parameters for these non-design-basis transients are being developed at this time. These parameters will be used to design fatigue usage and/or cycle counting algorithms to be implemented in the fatigue monitoring program prior to entering the period of extended operation.

Therefore, "will" be addressed is the accurate statement.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: B3.2-006

Clarify when the fatigue monitoring program will (is committed to) come into effect.

Final Response:

The Fatigue Monitoring Program will be fully implemented prior to entering the period of extended operation.

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Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: B3.2-007

Identify the frequency (minimum freq./max interval) for determination of CUF for the least frequently monitored component.

Final Response: The minimum frequency for determination of the CUF will be once per refueling cycle

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: B3.2

Provide condition report of the most recent representative fatigue failure experienced at PNP.

Final Response: Palisades does not have a history of Class 1 thermal fatigue failures. However, a recent PCS failure attributed to vibration fatigue (not an AERM) may be useful in providing objective evidence of how a thermal fatigue failure would be handled using our corrective actions and root cause procedures. Please see attached.

(Provided copy of CAP030845, RCE000251, CA015199, CA015200, CA015201, CA015202, CA015203, and CA015204)

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☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: C-PAL-96-1557 This Condition Report discusses polar crane bridge rail splice welds as being cracked. However, the disposition of the condition report appears to be to accept the cracks. The disposition states that the rust in the area would indicate that the cracked welds have been there for a while. This condition report is eight years old. Please discuss if the cracked welds were ever repaired and the rust removed and the area coated to prevent further rusting. Discuss if this operating experience is representative of how crane aging management will be performed during a renewed license.

Final Response: The welding of the vertical splice between each rail is vendor specific. As an example, the polar crane vertical splices were welded where the original Spent Fuel Pool rails were not. In the case of the Polar Crane, with a round rail configuration, there are always going to be some fit-up problems. Each section of the rail was bent at the factory to obtain its present shape prior to being shipped to the site. Although this bending was very precise, there was some tolerance allowed that makes each section slightly different. When the sections were placed on the support beam in containment, all sections did not perfectly align so a partial penetration splice weld was performed by the field installation team. When all ends had been connected, the rail was then welded to the support beam. There was no intension for the splice weld to perform any structural support -- it was just for installation.

Regarding the rust, these rails are designed to be outside in the elements. They are made out of extremely strong and durable carbon steel with no need for rust inhibitors. This rust is most likely there from construction when the rails were stored outside prior to installation and/or prior to installation of the Containment dome. Since there is no free water in Containment near the Polar Crane, the rust isn't a true corrosion problem -- its just there.

In summary, there is no need to fix the cracked vertical splice welds, to remove the rust or coat the rails to prevent more rust. The rails are looked at each outage by individuals that are specifically trained to know what is important for crane operability and safe operation of the crane. The attached is the statement identifying the cracked splice welds in the inspection procedure as specified in C-PAL-96-1557.

(Provided copy of MSM-M-13, "Overhead Crane Mechanical Inspection"; Page 3 of 17

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☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide copies of CAP039341, CAP039342 AND CAP039345 and documents describing their resolution.

Final Response: Information supplied

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.11-008

Please confirm that loss of material, if it reduces wall thickness to a point below the ASME allowable, will trigger an engineering evaluation even if the wall thickness is more than 60% of nominal.

Final Response: NMC will revise the governing procedure for the Flow Accelerated Corrosion Program to include the value of 87.5% of nominal wall thickness for non safety related piping as a trigger point to initiate engineering analysis to confirm that remaining wall thickness is acceptable to support the intended function or to determine corrective action, as applicable. This requirement will be implemented by March 24, 2009.

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Information Request: The regression analysis data shown on pages 42, 45 and 48 of the source document show tendon force values that are over twice as high as the raw tendon force data provided on pages 41, 43, 44, 46, 47, 49 and 50. Explain why the regression analysis tendon forces are over twice as high as the input data to the analysis.

Final Response: The analysis data is incorrect for Palisades; however, the data in the tables on related pages is correct. New pages are being sent and will be filed in the permanent record. Expected arrival for the new pages is Monday, June 27.

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Information Request: In the Palisades LRA Section B1.1, the applicant states that if a Palisades program is fully consistent with NUREG-1801, but is based on a different revision (usually later) of a code or standard referenced in the NUREG-1801 program description, the program is not considered to have an exception to NUREG-1801. However, because the GALL Report (NUREG-1801) guidance is based on specific revisions of the reference documents, the applicant must state the revision applicable to the specific aging management program. Then, if this revision is different than the revision referenced in the GALL Report, the applicant must declare this as an exception and provide the appropriate justification. The applicant is requested to identify the specific revision of the GALL reference that is being committed to in the application. Finally, the applicant is requested to identify those that should be considered as exceptions based on the discussion above. Each exception should be justified.

Final Response: NMC understands the NRC position that revisions of codes or standards used in AMPs that are not the same as those referenced in the GALL, are to be identified as exceptions to GALL. Therefore, code or standard revisions that are used in Palisades' programs, but are not referenced by either the 2001 or 2005 GALL descriptions, will be treated as exceptions to the GALL, and justification will be provided as required. Revisions or supplements to the affected program descriptions will be submitted to the NRC as described below.

Preliminary review indicates that the programs which are potentially affected by this position are as follows:

XL.M1 - ISI - See response to question 11 [NMC Tracking No. 82] for the ASME Code discussion and a commitment to submit a revised program description which identifies the code used in the AMP.

XL.M2 - Primary Chemistry - The 2001 and 2005 GALL revisions reference EPRI TR-105714 Rev 3, and the Palisades AMP is based on Rev 5. NMC will submit, for NRC review and approval, a comparison of EPRI TR-105714 revision 5 with revision 3 to identify the material changes that impact aging management and justify their acceptability by October 31, 2005. If necessary, the submittal will include a Water Chemistry Program description, revised to identify and justify use of TR-105714, Revision 5, as an exception to the NUREG 1801 program description.

XL.M2 - Secondary Chemistry - 2001 and 2005 GALL revisions reference TR-102134 Rev 3, and the Palisades AMP is based on Rev 6. NMC will submit, for NRC review and approval, a comparison of TR-102134 revision 6 with revision 3 to identify the material changes that impact aging management and justify their acceptability by October 31, 2005. If necessary, the submittal will include a Water Chemistry Program description, revised to identify and justify use of TR-102134, Revision 6, as an exception to the NUREG 1801 program description.

XL.M3 - Reactor Vessel Head Closure studs - See response to question 11 [NMC Tracking No. 82] for the ASME code discussion and a commitment to submit a revised program description which identifies the code used in the AMP.

XL.M11 - Nickel Alloy - The 2005 GALL revision deletes the XL.M11 program entirely. Therefore, no code or standard comparison or program description revision is required.

XL.M16 - Reactor Vessel Internals - The 2005 GALL revision deletes this program. Therefore, no code or standard comparison or program description revision is required.

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XL18 - Bolting Integrity - See response to question 11 [NMC Tracking No. 82] for the ASME Code discussion and a commitment to submit a revised program description which identifies the code used in the AMP. The reference to EPRI 104213 December 1995 is the same in NUREG 1801 and the AMP. Since the AMP uses standards referenced by GALL, no code or standard comparison or program description revision is required.

XL21 - Closed Cycle Cooling - The 2001 and 2005 revisions of NUREG 1801 reference EPRI TR 107396 revision 0 and the Palisades AMP is based on revision 1. NMC will submit, for NRC review and approval, a comparison of TR-107396 revision 1 with revision 0 to identify the material changes that impact aging management and justify their acceptability by October 31, 2005. If necessary, the submittal will include a Closed Cycle Cooling Water Program description, revised to identify and justify use of TR-107396, Revision 1, as an exception to the NUREG 1801 program description.

XL1 & S2 - IWE and IWL - See response to question 16 [NMC Tracking No. 113] for the ASME Code discussion and a commitment to submit a revised program description which discusses the code used in the AMP.

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☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The notes A through D provided for PNP LRA Tables 3.1.2-1 through 3.1.2-4, Table 3.2.2-1, Tables 3.4.2-1 through 3.4.2-1 and Tables 3.5.2-1 through 3.5.2-10 are not consistent with the notes provided in Table 4.2-2 of NEI 95-10 Revision 5, January 2005. Please clarify that the text accompanying these notes is the wording that was intended. For example, the text for note A for Tables 3.1.2-1 through 3.1.2-4 states the following "Consistent with NUREG-1801 item for component, material, environment, and aging management program. AMP is consistent with NUREG-1801 AMP." The statement "and aging management program" should state "and aging effect" to be consistent with Table 4.2-2.

Final Response: The differences between the LRA Standard Notes (Notes A through J) language (in LRA Sections 3.1, 3.2, 3.4 and 3.5) and the NEI 95-10 language for the standard notes were unintentional editorial errors. Notes A through J in the LRA are intended to have the same language and meaning as the standard industry notes introduced in the standard LRA format in 2003, and carried forward as Appendix D of NEI 95-10 Revisions 4, 5, and 6. In all the definitions of notes A through D in the LRA, "and aging management program" is hereby revised to state "and aging effect." Note that this response has no impact on the results reported in the LRA 3.x.2 tables.

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☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: GALL identifies an explicit edition and addenda of the ASME code as its basis for the Aging Management Program. The LRA does not explicitly identify the edition and addenda. Please identify the edition and addenda of the ASME Code or provide a justification for not having it.

Final Response: The ASME Section XI IWB, IWC, IWD, IWF Aging Management Program (AMP), to be reviewed by NRC for license renewal purposes, will be based on the 2001 edition, through the 2003 addenda, of ASME Section XI. The 2001 edition, including the 2002 and 2003 addenda, are referenced in NUREG 1801, draft Revision 1, publicly released on August 12, 2005, as providing an acceptable AMP. NMC will revise the ASME Section XI IWB, IWC, IWD, IWF Aging Management Program descriptions in LRA Appendices A and B to reflect the 2001 edition including the 2002 and 2003 addenda of ASME Section XI. The revised program descriptions will identify exceptions to this code taken by the program, if any, that impact aging management effectiveness. Appropriate justification will also be provided to show that the exceptions, if any, still provide an acceptable level of aging management. The revised program descriptions will be submitted for NRC review and approval by October 31, 2005.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The basis document stated that the stud material is ASTM A540-65, Grade B4 with minimum yield strength of 130 ksi. The GALL Report & RG 1.65 identified the stud material with a maximum tensile strength limited to less than 170 ksi, which is the actual strength. The min. YS of 130 ksi is for design purpose. Please clarify the actual material property is limited to less than 170 ksi.

Final Response: In 1977 the plant purchased 30 replacement reactor closure studs, nuts and washers. (PO 89020-Q 9142/1796). The material for the studs was the same as furnished under the original contract. Section 4.2 "Mechanical properties" of the specification for the replacement studs, PN-76-104 "Replacement of Reactor Closure Studs, Nuts, Washers", states that "as described in Regulatory Guide 1.65, the post tempered maximum tensile strength of the materials shall not exceed 170 ksi." WLR 7-6-05

The material properties of the reactor stud and nuts are therefore controlled by specification to be less than 170 ksi. Material test reports filed with the purchase order demonstrate material properties less than 170 ksi. WLR 7-6-05

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☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please clarify the closure stud inspection extent. The GALL report identified volumetric examination of flange threads and visual VT-1 examination of surfaces of nuts, washer & bushings. The basis document states B-G-1 only which does not include volumetric exam of flange threads.

Final Response: The 1989 Edition, No Addenda, of ASME Table IWB-2500-1 Examination Category B-G-1 has the requirement in Item No. B6.40 to perform a volumetric examination on Threads in Flange. The Palisades Nuclear Power Plant ASME Section XI Third Inservice Inspection Interval Class 1 Examination Plan contains a line item for Category B-G-1, Item No. B6.40. The remarks state: Examine 50% of ligaments at each scheduled exam. Total 100% per interval. Start at center line of stud hole no. 1 during first exam of interval.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Does this program manage nickel-alloy components other than Alloy 600/182/82? Alloy 690/52/152/132 material may be used in the RCS system or as repaired material. The program mentioned NRC Order EA-03-009 and Bulletin 2004-01. Please explain how other alloy 600/82/182 components, which subjected to PWSCC and are not addressed by NRC Order and Bulletin, are managed.

Final Response: A list of the Palisades 251 nickel-alloy locations that are part of the PCS boundary is contained in Engineering Manual Procedure EM-09-13, Attachment 3. These locations include CRDM nozzles, reactor vessel and vessel head mounted instrumentation penetrations, pressurizer nozzles and penetrations, Primary Coolant System piping penetrations and nozzles, steam generator penetrations and associated nickel-alloy welds/safe ends. Steam Generator U-Tubes are constructed of nickel-alloy and are managed by the SG Tube Integrity Program. 6/23/05
Please clarify the actual material property is limited to less than 170 ksi.

In 1977 the plant purchased 30 replacement reactor closure studs, nuts and washers. (PO 89020-Q 9142/1796). The material for the studs was the same as furnished under the original contract. Section 4.2 "Mechanical properties" of the specification for the replacement studs, PN-76-104 "Replacement of Reactor Closure Studs, Nuts, Washers", states that "as described in Regulatory Guide 1.65, the post tempered maximum tensile strength of the materials shall not exceed 170 ksi."

The material properties of the reactor stud and nuts are therefore controlled by specification to be less than 170 ksi. Material test reports filed with the purchase order demonstrate material properties less than 170 ksi. 6/29/05

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☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The response to Bulletin 2004-01 is for PZR penetration and steam space piping connection. The response does not address other RCS PWSCC locations. Please provide description how other PWSCC locations are addressed.

Final Response: NMC's use of the term "Alloy 600 penetrations" to describe various nickel alloy components, and the program title "Alloy 600 Program" rather than "Nickel Alloy Program", were not intended to exclude nickel alloys other than Alloy 600, nor configurations (e.g., butt welds) other than penetrations. Use of the term "Alloy 600" was simply carried over from existing terminology embedded in various plant documents and the Aging Management Program title. When the LRA refers to Alloy 600 penetrations or components, (other than when describing a specific component), the terms encompass nickel alloys of any configuration (i.e., "nickel alloy component locations") in the environments of interest. Consistent with this interpretation, the previous response to this question is revised as follows:

The Palisades Plant has 251 nickel alloy component locations, all of which are contained within the primary coolant system (PCS). The reactor vessel contains two nickel alloy locations, which are two (2) Reactor flange leak detector taps. The reactor pressure vessel head has 54 nickel alloy locations, which are categorized as follows: (45) - Control Rod Drive (CRD) nickel alloy nozzles that are J-welded at the reactor head inner-diameter (ID) and then butt-welded to the CRD flange above the reactor head; (8) Incore instrumentation (ICI) nozzles that are J-welded at the reactor head ID and then butt-welded to the ICI flange above the reactor head; (1) - Reactor vent line nozzle that is J-welded at the reactor head ID and then butt-welded to the reactor vent line above the reactor head. The pressurizer contains 136 nickel alloy locations, which are categorized as follows: (1) 3-inch ID X 6-inch outer diameter (OD) PORV nozzle located in the upper head; (1) 4-inch spray line nozzle assembly; (1) 12-inch surge line nozzle; (3) 3-inch ID X 6-inch OD valve nozzles; (8) 1-inch level nozzles, four upper and four lower; (2) 1-inch temperature element nozzle locations; (120) - Pressurizer heater penetrations, which are J-welded to the internal cladding of the vessel lower head. Each steam generator contains two (total of 4) nickel alloy locations, which are the bowl plugs. The primary coolant piping contains 55 nickel alloy locations, which are categorized as follows: (4) - 12-inch, schedule 140, safety injection and shutdown cooling inlet nozzles; (1) - 12-inch, schedule 140, shutdown cooling outlet nozzle; (1) 12-inch schedule 140 surge nozzle; (22) - Temperature measurement, Inconel SB-166 nozzles on the primary loops; (1) 2-inch, schedule 160 hot leg drain; (4) - 2-inch, schedule 160 cold leg drains; (10) - ¾-inch, schedule 160, pressure measurement and sampling nozzles; (8) - ¾-inch, schedule 160, pressure measurement nozzles; (2) - 3-inch, schedule 160 spray nozzles; (2) - 2-inch, schedule 160 charging inlet nozzles

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Status: Closed - Accepted by Auditor

Information Request: In Table 3.1.2.1, the applicant credits Alloy600 program for thermal sleeves and cladding. In Table 3.1.2.2, the applicant credits alloy 600 to manage RV head O-ring leakage monitoring. Please provide description how these components are managed.

Final Response:

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends XLM28, Buried Piping and Tanks Surveillance," for external surfaces of buried carbon steel tanks and piping with external coatings, wrappings, and cathodic protection systems. Explain why this program is not applicable for the PNP buried piping. Provide documentation.

Final Response: We don't credit a cathodic protection program and we also don't credit coatings and wrappings. We credit the inspection program and not the XLM28 Buried Piping and Tanks Surveillance. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify buried components and materials that are susceptible to selective leaching aging effects.

Question B2.1.5-002 Follow-up From NRC 7-19-05

Response is NOT acceptable. The response is not consistent with the discussions during the audit on site. Per the Project Team's discussions with the applicant, PNP does not have any buried piping which is managed by the B2.1.5 AMP and is subject to selective leaching. It is the Project Team's understanding that all materials susceptible to selective leaching are in the fire protection system and are managed by the Fire Protection AMP. Does PNP intend to modify the LRA AMP B2.1.5, to delete the discussion on management of selective leaching or has the Project Team misunderstood the PNP representative's statements that B2.1.5 is not used in conjunction with AMR line items identifying components made from materials that are susceptible to selective leaching.

Final Response:

There are four systems at Palisades that contain carbon steel buried components that are managed by buried services program. The systems are: Condensate and Condenser, Fuel Oil, Misc. Gas, and Service Water. There are three systems that contain stainless steel buried components: Condensate and condenser, Demin Make Up Water, and Feed water. In all cases, the buried components are Piping. 6/22/05

Palisades does not credit the Buried Services Corrosion Monitoring Program with managing selective leaching. Selective leaching is a well defined subset of the One Time Inspection Program. 6/30/05
WLR 7-6-05

Response to NRC follow-up Question

The LRA section B2.1.5 describes our Buried Services Program. When discussing the scope of the Buried Services program we tried to highlight two things that we hoped would make the scope more understandable.

The first would be that we have buried pipe and components in the fire protection system that are not in scope for the Buried Services Program. Since the GALL fire protection and fire water systems has requirements for pipe wall thickness inspections and pipe flow verifications, we decided to include the fire protection system piping (above ground and buried) under the Fire Protection Program Basis Document verses the Buried Services Program.

The second was to mention that selective leaching for all susceptible components, which would include some buried components, is covered by the One-Time Inspection Program.

These two clarifications make the following statements true which may had led to some of the confusion in our discussion.

There are no components which are managed by B2.1.5 "Buried Services" that are susceptible to selective leaching.

There are components in several systems that are susceptible to selective leaching but the only buried components susceptible to selective leaching are in the fire protection system.

Summary Report of License Renewal Review Questions for: AMP Audit

All components susceptible to selective leaching are managed by the One-Time Inspection program regardless if they are buried or not, so selective leaching is not managed by the fire protection program. In the Palisades License Renewal Application, Appendix B2.1.5, Program Description, it states: Age-related degradation of buried components susceptible to selective leaching is managed by the One-Time Inspection Program. This statement is a clarification that Selective Leaching is not managed by the Buried Services Corrosion Monitoring Program. B2.1.5 does not need to be modified to remove the statement as it is correct as stated.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide documents/drawings to verify that the tanks shown on LR-C3 are above ground tanks and not in contact with soil/sand.

Final Response: There is only one below grade tank at Palisades in scope for license renewal. The Diesel Fuel Oil Storage Tank is below grade but is contained in a vault and not exposed to an environment of soil. The diesel fuel oil storage tank is managed by the Diesel Fuel Storage and Monitoring Program. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify buried components and materials that are managed by this program.

Final Response: See Question B2.1.5-002. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Since buried stainless steel components are not coated, what are the parameters that are monitored/inspected for stainless steel components. Is this an exception to the GALL AMP?

Final Response: The Buried Services Corrosion Monitoring Program contains the requirements to perform a visual inspection of external surfaces of buried stainless steel components, inspecting for evidence of MIC, Crevice, and Pitting Corrosion.

This is not an exception to the GALL AMP.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify the areas with the highest likelihood of corrosion problem.

Final Response: This is something that we will look at during implementation. 6/21/05

Inspections of opportunity, which might not result from aging effects, will not only inspect the failed component/maintenance activity but will extend on either side of the component, as practical, to validate aging management. If additional inspection are required as identified in question 11, Engineering Judgment will be used to select locations most susceptible to age related degradation (Elbows, Tees, Saturated Soil, Traffic Etc.). 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Have you identified any susceptible location based on previous experiences?

Question B2.1.5-007 NRC Follow-up 7-19-05

Response is NOT acceptable. The response is not relevant to the question originally asked by the Project Team. The applicant should provide additional information related to OE as was discussed during the during the Project Team's site interviews.

Final Response:

Palisades does not credit the Buried Services Corrosion Monitoring Program with managing selective leaching. Selective leaching is a well defined subset of the One Time Inspection Program. 6/30/05

NRC Follow-up response.

The only buried components inspected were related to failures. As identified in the Operating Experience, all failures were evaluated to determine the cause. All failures were either event driven or design issues. If sufficient inspections of opportunities are not performed prior to the period of extended operation, then additional inspections will be performed to ensure components are adequately managed. If additional inspection are required as identified in B2.1.5-011, Engineering Judgment will be used to select locations most susceptible to age related degradation (Elbows, Tees, Saturated Soil, Traffic Etc.). 7/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide information on any maintenance for buried piping or excavation has been done during life of the plant. Provide inspection reports and corrective actions, if any.

Question B2.1.5-008 NRC Follow-up 7-19-05

The response is NOT acceptable. The applicant's response is the same as provided in its response to Question B2.1.5-009. The project team requests the applicant to identify how many times it has excavated buried piping, which pipes or systems were excavated, the results observed from these inspections, and the years when these inspections were performed.

Final Response:

OE provided as noted in B2.1.5-009

The failure of the Alternate Steam Supply Line for Aux. Feed water Pump 8B (CAP029922) was the result of a design deficiency. The coating used on the hot steam line was for a cold application. Also, a leaking valve resulted in the Alternate line staying hot for a much longer duration than anticipated during the design. There are no other hot buried components at Palisades. Additionally, the Alternate Steam Supply line has been abandoned in place and is not in scope of license renewal. Failure of the Fire Main (CAP005264) was event initiated. Since the Fire Protection Program manages the buried fire protection piping, the failure of the fire main is discussed in the Fire Protection Program. 6/30/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide details of the issues that were addressed in the LRA Section B2.1.5 for operating experience. Explain why the identified issues were not resulted from aging effect. Present documentations for justification.

Question B2.1.5-009 NRC Follow-up 7-19-05

The response is NOT acceptable. The applicant's response to this question is incomplete as it only provides the conclusion that the failures were design discrepancies. Please describe the type of failure mechanisms (not just the conclusion), that have occurred in the auxiliary feed water and fire protection systems piping (including year, location and a brief description of the event). Then explain why these failures were not age related.

Final Response:

OE data from Buried Services. This was event driven and is described in the PBD. Ref PBD section. 6/21/05

UPDATE:

PBD provided. 6/23/05

The failure of the Alternate Steam Supply Line for Aux. Feed water Pump 8B (CAP029922) was the result of a design deficiency. The coating used on the hot steam line was for a cold application. Also, a leaking valve resulted in the Alternate line staying hot for a much longer duration than anticipated during the design. There are no other hot buried components at Palisades. Additionally, the Alternate Steam Supply line has been abandoned in place and is not in scope of license renewal. Failure of the Fire Main (CAP005264) was event initiated. Since the Fire Protection Program manages the buried fire protection piping, the failure of the fire main is discussed in the Fire Protection Program. 6/30/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide detail information on the industry experience with the diesel fuel line leakage, which is stated in LRA.

Question B2.1.5-010 NRC Follow-up 7-19-05
Response is acceptable.

Final Response:

OE package provided. 6/23/05

This industry operating experience identified a through wall leak in the diesel fuel oil pump discharge piping approximately three inches below grade at the point where the pipe entered the ground. Inspections, testing and evaluations determined the cause of failure, the pipe did not have the external coating as required by the piping specification. 6/30/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Appendix A should say that this is a new program and it will be developed to be consistent with the GALL program with the following improvement.

Based on the staff new position on this AMP, this should be revised to:

The inspections are to be performed in the areas with the highest likelihood of corrosion problems, Upon entering the period of extended operation, the licensee (applicant) is to perform a focused inspection within ten years, unless an opportunistic inspection occurred within ten-year period.

Final Response:

Except for the Appendix "A" part we agree totally with the statement on inspection. 6/21/05 Balance to be responded to in RAI B2.1.5-1 from 6/3/05 letter

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide a copy of the basis document for this AMP.

Final Response: A copy of the AMPBD was provided 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The version of the EPRI document is not provided in the text. Provide the revision number of the version that was used.

Final Response: The version is from the PBD. PBD reference 8.5. EPRI TR-107396, "Closed Cycle Cooling Water Chemistry" Revision 1, April 2004. 6/21/05
UPDATE:
A copy loaned for use. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The PNP LRA states that sodium nitrite and tolyltriazole (TTA) are used for carbon steel and copper corrosion control. Applicable chemistry procedures include provisions for monitoring CCCW Systems water chemistry and adding chemicals as necessary to maintain chemistry parameters within limits. These procedures, as well as the administrative limits for corrosion inhibitors sodium nitrite and TTA, are based on the requirements and guidelines in EPRI TR-107396. Provide a copy of (or if there are many, provide several relevant examples) of this procedure used to maintain the CCCW systems water chemistry within acceptable limits (question B2.1.6-003).

Final Response: Chemistry Procedure COP-16A 6/21/05
UPDATE:
A copy of this procedure was provided. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: In the PNP LRA, the applicant states that Palisades does not credit active flow testing for managing age-related degradation of CCCW components. However, performance of selected heat exchangers is monitored in accordance with the Master Heat Exchanger Testing Plan. Provide documentation to justify that the master Heat Exchanger program provides the same level of aging management as would be achieved by the performance and functional testing recommended in EPRI TR-107396. This should cover all three elements related to the exception, i.e., parameters monitored, tested and/or inspected; detection of aging effects and monitoring and trending.

Final Response: NMC has concluded that the exceptions identified in LRA Section B2.1.6 were not required. A review of the supporting data, for the testing performed on the closed cycle cooling water systems pumps and heat exchangers, revealed that the required pump and heat exchanger testing defined in NUREG 1801 is performed. At the time of the on-site audit, it appeared that there could be one remaining exception related to the test frequency for pumps and heat exchangers in the Shield Cooling Water System. Subsequent reviews have confirmed, however, that the shield cooling system is in-scope as a pressure boundary only, so performance testing of shield cooling pumps and heat exchangers is not required for aging management.

Therefore, LRA Section B2.1.6 is hereby revised as follows:

On page B-42, under NUREG-1801 Consistency, replace the entire section with the following statement: "The closed Cycle Cooling Water Program is consistent with NUREG 1801, Section XI.M21, "Closed-Cycle Cooling Water System"."

On pages B-42 and B-43 under the heading of Exceptions to NUREG-1801, replace the entire section with the following statement: "None."

On page B-44 under the heading of Parameters Monitored, Tested , and/or Inspected, replace the last paragraph, including exception bullet, with the following statements. "This program monitors the effects of corrosion by surveillance testing and inspection. For pumps, the parameters monitored include flow, discharge and suction pressures. For heat exchangers, the parameters include flow, inlet and outlet temperatures, and differential pressures as appropriate. This element is consistent with NUREG 1801, Section XI.M21, "Closed-Cycle Cooling Water System"."

On pages B-44 and B-45 under Detection of Aging Effects, replace the last paragraph, including exception bullet, with the following statements. "Performance and functional testing ensures acceptable functioning of system or components. For systems or components in continuous operation, performance adequacy is determined by monitoring data trends . Components not in operation are periodically tested to ensure operability. This element is consistent with NUREG 1801, Section XI.M21, "Closed-Cycle Cooling Water System"."

On page B-45 and B-46 under Monitoring and Trending, replace the last paragraph, including both exception bullets, with the following statements: "Performance and functional testing are performed at least every 18 months to demonstrate system operability, and tests to evaluate heat removal capability of the system and degradation of system components are performed every five years. This element is consistent with NUREG 1801, Section XI.M21, "Closed-Cycle Cooling Water System"."

On page B-46 and B-47 under Acceptance Criteria, replace the last paragraph, including both exception bullets, with the following statement: "This element is consistent with NUREG 1801, Section XI.M21, "Closed-Cycle Cooling Water System"."

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: In the PNP LRA, the applicant states that the performance and operability testing of selected pumps, including flow, suction and discharge pressure, is monitored in accordance with ASME Section XI, Subsection IWP, In-service Testing Program. Please provide documentation that the pump testing under the ASME Section XI, Subsection IWP, In-service Testing provides the same level of aging management as would be achieved by implementing the performance and functional testing requirements recommended in EPRI TR-107396. This should cover all three elements related to the exception, i.e., parameters monitored, tested and/or inspected; detection of aging effects and monitoring and trending.

Final Response: The pumps in the closed cycle cooling water systems are those associated with the Component Cooling Water (CCS) System, Emergency Diesel Generator (EDG) Jacket Cooling Water systems, and Shield Cooling System (SCS).

The CCS pumps, P-52A, B, C, are tested under a quarterly surveillance procedure, which records suction and discharge pressure, pump dp, flow rate, and heat exchanger dp. The Diesel Jacket Water Cooling System pumps, P-211 A&B, are skid-mounted equipment and are driven directly from the diesels. Discharge pressure and temperature are recorded for these pumps in accordance with accepted practices for testing of skid-mounted equipment. For the non-safety related Shield Cooling System pumps, P-77 A & B, no specific functional testing is completed other than operational parameter monitoring of the system. Since the Shield Cooling Water System is in scope for a pressure boundary function only, the pump testing is not required to age manage the pumps.

During the audit, a follow up question was asked about testing of heat exchangers in closed cycle cooling water systems. The heat exchangers in the closed cycle cooling water systems are those associated with the Component Cooling Water (CCS) System, Emergency Diesel Generator (EDG) Jacket Cooling Water systems, and Shield Cooling System (SCS).

The master heat exchanger Testing plan shows that the CCS heat exchangers, E-54 A and B, are inspected every other refueling outage using the ET/EPRI single tube method; the diesel jacket water coolers, E-22 A and B, are inspected every 18 months, and the Shield Cooling heat exchanger, E-64, is eddy current tested once every ten years. Since the Shield Cooling heat exchanger is in scope for pressure boundary only, an inspection interval of ten years is sufficient to monitor for degradation of the pressure boundary function.

This testing is consistent with that described in NUREG 1801, Section XI.M21.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: In the PNP LRA, the applicant is using OTI for certain systems and for the detection of corrosion in the areas of stagnant flow conditions in the CCCW Systems. Provide the sample size used for the OTI of areas with stagnant flow conditions.

Final Response: This is implementation and has not been identified. Formulation of implementation procedures and methods is scheduled to begin later this year and continue on into 2006. 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide several examples of plant chemistry procedures used to monitor water chemistry in CCCW components. This should include documentation of the testing frequency and acceptance criteria.

Final Response: COP 16A 6/21/05

UPDATE:
Copy provided during discussion/interview. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide an example of the water chemistry procedure in which corrosion inhibitor concentration limits are maintained.

Final Response: COP 16A same question as B2.1.6-03? 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide several examples of system and component testing procedures for CCCW systems.

Final Response: IST testing procedures for pumps and heat exchangers. 6/21/05

UPDATE:

These procedures provided. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide documentation for several examples of acceptance criteria used in the system and performance testing, including a discussion of how these criteria were developed. This should include the documentation the justification of the acceptance criteria.

Final Response: This information should be in the same procedures that were referenced above. 6/21/05

UPDATE:
Provided. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Based on the issues identified as part of the plant specific operating experience review the following issues were identified: Tube blockage and fouling in Component Cooling Heat Exchanger, Fuel Pool Heat Exchanger tube breakage due to high Component Cooling Water flow, Through wall flaw in Spent Fuel Pool Cooling pipe. Provide documentation of these plant issues including and necessary changes to the CCCW Program that were warranted through the corrective action program.

Final Response: This OE information provided. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: In the PNP LRA, the applicant states that various related NRC and/or industry generic communications have been issued, and, in turn, have been incorporated into the program as applicable. Provide additional clarifying information related to what industry issues have been incorporated into the CCCW Program.

Final Response: Check the references in the CCCW system and then provide the information. 6/21/05 Update: Believe this issue has been closed 6/22/05 2100

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Provide the documentation that approves the use of the 1998 edition (no addenda) of the ASME B&PV code by Palisades for IWE and IWL inspections.

Final Response: The NRC approved use of the 1998 edition in a letter dated September 27, 2002, "Palisades Plant – Evaluation of Containment In-service Inspection Relief Requests (TAC Nos. MB4216 and MB4218)".

The Palisades Containment Inservice Inspection Program references the 1998 edition, no addenda, for Section XI, Subsections IWE and IWL, except that the personnel qualification process is based on the 1992 edition through 1992 addendum. NMC will revise the Containment Inservice Inspection Program description in the LRA to identify use of the 1998 edition as an exception to GALL. Exceptions taken to the 1998 edition, if any, will be identified and justified as part of the program description. A comparison of the 1998 edition with the 1995 edition/1996 addendum referenced in NUREG 1801, revision 0, or the 2001 edition, including the 2002 and 2003 addenda, referenced in NUREG 1801, draft revision 1 (publicly released on August 12, 2005), will also be developed to support the adequacy of the 1998 edition of IWE and IWL for aging management. The revised program description and comparison will be submitted for NRC review and approval by October 31, 2005.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

Provide Palisades Engineering Manual Procedure EM-09-12 which describes the containment inservice inspection, testing and aging management program.

Final Response:

EM-09-12 6/21/05

UPDATE:

Provided EM-09-12, "Containment Structural Integrity Surveillance Program." 6/22/05

UPDATE:

This document provided during interview. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question

Explain how the tendon surveillance program was affected by the steam generator replacement in 1990 and performing the second Structural Integrity Test (SIT) on the containment.

Final Response:

The best explanation is found with the 20-Year Tendon Surveillance Report located at C/F-F097/ 1329. This report contains a letter to the NRC dated February 12, 1991 identified as licensing correspondence LC#501389. Also see CAP001757. There is a significant amount of information available by searching RecTrak using the search criterion Date = *9000* or *9100* and Freetext = *Tendon* 6/21/05

UPDATE:

Provided CAP001757. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

Provide all the lift-off test results for the common tendon and provide the test results for tendons located where the hole was cut in the containment for the steam generator replacement.

Question B2.1.7-004

The response is NOT acceptable. The applicant's response to this question references ASME Section XI, Subsection IWE instead of IWL, which is the subject of this question. Does the applicant intend to modify its response to correct this apparent typographical error?

Final Response:

The latest common tendon results are contained in PSC's, Palisades 30-Year Tendon Surveillance Report, Section 2, VIII, "Comparison with Original Installation Data."

The above PSC report, as reviewed by the auditor, contained the wrong regression plots and tables of tendon forecasts. The incorrect pages have been replaced (see attached pages). This data is consistent with the results reported in the associated tables.

[See email dated 7/13/05 and word file for info sent to NRC

The Palisades tendon surveillance program was directed by Plant Technical Specifications until 10 CFR 50.55a invoked testing in accordance with ASME Section XI, Subsection IWE in 1996. Palisades Technical Specifications did not require the selection of common tendons. As a result, common tendons were not defined at Palisades until the 30-Year tendon surveillance conducted in 2002. The selected tendons did not meet the desired criteria in that they were detensioned during the first tendon surveillance in the early 1970s. Despite this fact, Palisades intends to continue with the presently identified common tendons because of the availability of surveillance results from early plant operations through the present time.

See response to RAI 4.5-1 provided in NMC letter dated 7/1/05 for listings of all surveillance results.

[See RAV email to KOC dated 7/13/05 & associated PDF file for remainder of info provided] Update 07/22/05 BGB In the above response, the reference to ASME Section XI, Subsection IWE should be Subsection IWL.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation question
Provide the latest trend study for the common tendons.

Final Response: The latest trend study is contained in PSC's, Palisades 30-Year Tendon Surveillance Report, Section 2, VIII, "Comparison with Original Installation Data." 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification question
Who is the Responsible Engineer (also a PE) at Palisades regarding whether there is any evidence of damage or degradation sufficient to warrant further evaluation or repair?

Final Response: Palisades uses multiple Professional Engineers; however, the primary contact is George E. Schrader, Engineering Programs 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation question
Palisades lists the following Containment Inservice Inspection Program issues under operating experience for this AMP.

Liner plate corrosion
Unacceptable tendon liftoff value
Tendon gallery corrosion
Tendon grease leakage
Moisture barrier not in place
Tendon sheath water intrusion

Provide the documentation for these issues where they were evaluated and resolved

Final Response: UPDATE:
Liner Plate Corrosion - CAP006041, CAP015560; Tendon Liftoff Values - CAP002677, CAP-31256; Tendon Gallery Corrosion - CAP007614; Tendon Grease Leakage - CAP007614, CAP011404, CAP016693, CAP024181, CAP031171, CAP032838; Moisture Barrier - CAP006785, CAP007368; Tendon Sheath Water Intrusion – CAP031258, CAP020692 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

Provide the procedures for the Containment Leakage Testing Program. Provide the procedures for performing the visual examinations of the containment exterior and interior prior to performing a LRT. Explain if these inspections are part of the ASME Section XI IWL inspections or different. Provide examples of the summary reports for the LRT results and containment visual inspections.

Final Response:

EM-09-10; RT-36 (FT-7, RT-142) 6/21/05

UPDATE:

EM-09-10, "Containment Leak Rate Testing Program," RT-36, "Containment Integrated Leak Rate Test" (FT-7, "Containment Inservice Inspection – Concrete," RT-142, "Containment Inservice Inspection – Metal Liner") 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

On page B-59 of the Palisades LRA under Program Element Scope of Program, the applicant states that the scope of the Palisades Containment Leakage Testing Program satisfies the requirements of 10 CFR 50, Appendix J, Option B, but takes the following three approved exceptions to the guidance given in RG 1.163, NEI 94-01, and ANSI/ANS 56.8:

- a. Regulatory Guide 1.163 stipulates that containment purge valves are to be tested at least every 30 months. The NRC has approved application of performance based test interval extension criteria to the Palisades containment purge valves. However, Palisades has retained the Improved Technical Specification requirement to perform a leakage test on these valves every 184 days.
- b. 10 CFR 50, Appendix J, Option B states that Type B tests are to be done at accident pressure. The NRC has approved testing of the Palisades personnel air lock door seals at 10 psig rather than Pa = 53 psig.
- c. NEI 94-01 specifically requires that air locks door seals be tested following air lock door use when containment integrity is required.

Final Response:

- a. March 30, 2001
 - b. Amendment 126 June 1, 1989; exemption December 6, 1989
 - c. Amendment 177 and exemption September 30, 1997 6/21/05
- UPDATE:
- a. March 30, 2001
 - b. Amendment 126 June 1, 1989; exemption December 6, 1989
 - c. Amendment 177 and exemption September 30, 1997 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide a copy of the basis document for this AMP

Final Response:

Complete 6/21/05 Update: Broad overview. COP-22A describes which tanks we sample. We switched to low sulfur fuel oil in February to avoid particulate problems. We will monitor and filter fuel oil as necessary if we identify a problem with particulates in the fuel oil. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The GALL Report AMP XLM30 states that the program is focused on managing the conditions that cause general, pitting, and microbiologically influence corrosion (MIC) of the diesel fuel tank internal surfaces and that it serves to reduce the potential of exposure of the tank internal surface to fuel oil contaminated with water and microbiological organisms. However, in the PNP LRA, the applicant states that piping, pumps, and other passive components are managed by the Diesel Fuel Monitoring and Storage program. Please justify the effectiveness of this program on components other than fuel tanks to manage conditions that cause general, pitting, and microbiologically influence corrosion (MIC) of the diesel fuel tank internal surfaces and that it serves to reduce the potential of exposure of the tank internal surface to fuel oil contaminated with water and microbiological organisms.

Final Response: The diesel Fuel Oil piping and components included the diesel Fuel Oil Monitoring Program as an aging management program as a mitigative measure to help keep water out of the piping and components. One time inspection is also mentioned on an inspection program to provide evidence that corrosion in the affected components does not exist. 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of the periodicity at which the plant tests fuel oil for biological activity and corrosion.

Final Response: Periodicity is described in the PAD. 6/21/05

UPDATE:
Information provided during interview. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of recent purchase specifications or purchase orders that indicate that fuel oil meets ASTM D975 standards.

Final Response:

Periodicity is described in the PBD. 6/21/05

Purchase Order for 2005-2006

COP-22A Basis Page 6 of 13 attached discussing COA

Data from Fuel Oil Tanker attached; particulates analysis started in 2002 for T-10A delivery when requested by Chemistry management. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of the test results from the off-site test facility for relative corrosivity.

Final Response:

Periodicity is described in the PBD. 6/21/05

Copper strip testing data is on the attached table, "Herguth Test Results from the WinCDMS for Question #B2.19-006"

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of plant procedures, examples of completed test or inspection results (i.e., datasheets), and other program documents used to implement the requirements of ASTM D975 for monitoring fuel oil quality and the levels of water and microbiological organisms in the fuel oil. This response should include the copies of the revisions of the ASTM D975 that were used in preparation of the plant procedures and other program documents.

Final Response: COP-22A. 6/21/05

COP-22A and MC-17 already provided.

Graphs provided for Diesel Fuel Oil Storage Tank, T-10A

Data from samples sent offsite that was inputted into WinCDMS is in the attached table, "Herguth Test Results from the WinCDMS for Question #B2.19-006"

Data from MC-17 that was inputted into WinCDMS is attached in table, "Diesel Fuel Oil Storage Tank, T-10A data stored in WinCDMS"

NOTE: Chemistry was not using WinCDMS to store all data until late 2001. This data was written in hard copy logbooks that were microfilmed. The logbooks were not indexed when they were sent to filming, so if this data is needed we will need 2-5 days to research it. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of plant procedures, examples of completed test or inspection results (i.e., datasheets), and other program documents used to implement requirements of, or otherwise references ASTM D4057 for fuel oil sampling. This response should include the copies of the revisions of the ASTM D4057 that were used in preparation of the plant procedures and other program documents.

Final Response: COP-22A. 6/21/05

See COP-22A and COP-22A basis documents. 6/22/05

UPDATE:

Copies provided during discussion. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of plant procedures, examples of completed test or inspection results (i.e., datasheets), and other program documents used to implement requirements of, or otherwise references ASTM D1796 and D2709 used as the basis for water and sediment analysis in fuel oil. This response should include the copies of the revisions of the ASTM D1796 and D2709 that were used in preparation of the plant procedures and other program documents.

Final Response: COP-22A. 6/21/05

See COP-22A and COP-22A basis documents.
Procedure CH 3.36, Water and Sediment Analysis attached
Data is provided under question B2.1.9-006. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples of plant procedures, examples of completed test or inspection results (i.e., datasheets), and other program documents used to implement requirements of, or otherwise references ASTM D2276 used as the basis for particulate analysis in fuel oil. This response should include the copies of the revisions of the ASTM D2276 that were used in preparation of the plant procedures and other program documents.

Final Response: COP-22A. 6/21/05

Procedure COP-22A and CH 3.52 were already provided.
Data is provided under question B2.1.9-006. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples from the Corrective Action Program indicating the effectiveness of the Palisades Fuel Oil Monitoring and Storage program. Corrective action reports should include examples for several components containing fuel oil if available.

Final Response: The initial self-assessment performed in 2001, "Emergency Diesel Generator Reliability Assessment 2001-08" is attached. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: ISG-4 and the GALL Report X1.M26 recommends periodic inspection and test of halon/carbon dioxide fire suppression system. Clarify whether B2.1.10 AMP included this, if not explain why.

Final Response: Halon/carbon dioxide system are not in scope for license renewal. Also not brought in under A(2) effort. 6/21/05
Update Palisades uses water spray to protect some areas (cable spreading room etc.) that are typically protected by either Carbon Dioxide or Halon at most plants.
6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: ISG-4/GALL program scope of program lists penetration seals, fire barrier walls, ceilings, and floors, and all fire rated doors as components require aging management. Clarify whether any penetration seals are managed by this LRA AMP. Identify walls, ceilings, doors and floor that their aging effect is managed by fire protection AMP.

Final Response: The PBD should clarify this questions. The program has a pointer to the structural monitoring program for ceiling walls and floors. 6/21/05

Refer to FPSP-RP-11, Rev. 6, for Fire Barrier Penetration Seal Inspection Surveillance. This inspection states that 10% of penetration seals will be inspected every 18 months, and includes acceptance criteria for each seal type. Fire Barrier Penetration Seals is listed in the LRA as "Fire Barrier XXX bldg - Fire Stop, Protected", in the LRA table 3.5.2-8, "Structures and Component Supports - Miscellaneous Structural and Bulk Commodities" 6/22/05 Update The PBD should clarify this questions. The program has a pointer to the structural monitoring program for ceiling walls and floors. 6/21/05 Refer to FPSP-RP-11, Rev. 6, for Fire Barrier Penetration Seal Inspection Surveillance. This inspection states that 10% of penetration seals will be inspected every 18 months, and includes acceptance criteria for each seal type. Fire Barrier Penetration *Remaining Information in Comment Column

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify fire barriers and other components with their associated material, environment and aging effects that are managed by the fire protection program.

Final Response: Update: Fire Barriers are listed in the LRA table 3.5.2-8, "Structures and Component Supports - Miscellaneous Structural and Bulk Commodities" 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the fire hazard analysis report and identify areas with fire severity and for safe shutdown.

Final Response: Update: Fire Hazards Analysis has been provided to the NRC inspector. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide procedures that are implemented for fire protection preventive actions. Identify specific sections that discuss these preventive measures.

Final Response: Ken states that these would be FPIP-7 and Admin 1.01 6/21/05

Update: Palisades is consistent with the GALL (ISG-04) requirement that states "...the fire hazard analysis assesses the fire potential and fire hazard in all plant areas. It also specifies measures for fire prevention, fire detection, fire suppression, and fire containment and alternative shutdown capability for each fire area containing structures, systems, and components important to safety." 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends at least bi monthly visual inspection of hollow doors. LRA does not specify frequency of inspection. Clarify that the same frequency is used, if not explain why (justify) and add this to the exceptions.

Final Response: ISG-04 states that a plant specific interval is allowable. 6/21/05

Update: Palisades inspection interval for hollow metal fire doors is every 6 months. This frequency has been at every 6 months for years, is considered satisfactory, and has not required a change due to not having a trend of significant aging of hollow metal fire doors. This procedure is FPSP-SO-2, which lists each of the fire doors, inspection requirements, and acceptance criteria. Note commitment in LRA to revise inspection criteria and acceptance criteria for fire door clearances. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends inspections to examine any sign of degradation such as cracking, seal separation from walls and components, separation of layers of material, rupture and puncture of seals which are directly caused by increased hardness and shrinkage of seal material due to weathering. LRA does not provide any information related to seals aging management. LRA does not provide any information recreated to the seals aging management. Explain how seals aging is managed. Specifically, explain how change of hardness and shrinkage will be monitored/inspected. Provide procedures and examples of inspections that were performed.

Final Response: Seal aging is managed by inspection as stated in the PBD. 6/21/05

Update: Hardness and shrinkage is managed by visual inspections for cracking and gaps, which are the result of penetration seals drying out, hardening, or shrinking. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends that fire door clearances to be checked at least once bi-monthly. The LRA does not specify frequency of inspection. Clarify that the same frequency is used, if not explain why (justify) and add this to the exceptions.

Question B2.1.10-008 NRC Follow-up 7-19-05
Response is acceptable.

Final Response: ISG-04 states that a plant specific interval is allowable. 6/21/05

Update: See response to B2.1.10-6 above. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends that functional tests of fire doors are performed daily, weekly, or monthly (which maybe plant specific) to verify the operability of automatic hold-open, release, closing mechanisms, and latches. Identify functional tests that are performed at Palisades with their frequencies.

Final Response: The first statement of the question is a restatement of a portion of the GALL XI.M26 element #3 "Parameters Monitored/Inspected". ISG -04 "aging Management of Fire Protection Systems For License Renewal, contains clarifications of the GALL requirements. The later ISG version restates the XI.M26 "Fire Protection" requirements and does not contain this stated requirement for functional testing of fire doors.

Procedure number, FPIP-4 "Fire Protection Systems and Fire Protection Equipment", Attachment 8 Revision 19 contains the following requirements for Palisades Fire doors.

At least once per six months, all fire doors shall be verified OPERABLE by visually inspecting the structural integrity, automatic hold-open, release, closing mechanism and latches and by verifying:

A. ☐ At least once per 31 days, the OPERABILITY of the fire door supervision system for each electrically supervised fire door.

B. ☐ At least once per seven days that each locked fire door is closed.

C. ☐ At least once per 24 hours, that doors with automatic hold-open and release mechanisms are free of obstructions.

D. ☐ At least once per 24 hours, that each unlocked fire door without electrical supervision is closed.

The six month test is performed using procedure, FPSP-SO-2 INSPECTION AND TESTING OF PALISADES PLANT FIRE DOORS Revision 2. This procedure lists the fire doors to be inspected and contains the inspection criteria. The inspection criteria includes inspecting Guides, Rollers, Bearings, Counterbalance Weights, Door Closer, Door Knobs, Latching Hardware and Strike Plate, Door Hinges, Fusible Links, and Door Labels. It also contains requirements to examine fire doors and frames for holes, penetrations, or other damage which could render the door ineffective/inoperable. 6/29/05

WLR 7-6-05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends periodic visual inspection and functional tests at least once every six months examines the signs of degradation of the halon/carbon dioxide fire suppression system. The LRA does not discuss visual inspection function tests for halon/carbon dioxide fire suppression systems at Palisades. Clarify whether any halon/carbon dioxide test is done at Palisades. If so, state the frequency of the tests and identify the procedures. If not, explain why and add this to the exceptions.

Final Response: Halon/carbon dioxide system are not in scope for license renewal. 6/21/05

Update: Palisades uses water sprinklers for protection of areas that are typically protected by Halon and Cardox type systems at other plants, such as the Cable Spreading Room. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends visual inspection (VT-1 or equivalent) of approximately 10% of each type of seal in walk downs is performed at least once every refueling outage. If any sign of degradation is detected within that 10%, the scope of the inspection and frequency is expanded to ensure timely detection of increased hardness and shrinkage of the penetration seal before the loss of the component intended function. The LRA takes exception to the visual inspection for seals, fire barriers, and fire doors.

a) Describe the type of visual inspection is used for the seals, b) identify the type of seals, fire barriers, and fire doors are used at Palisades, c) explain how shrinkage and/or hardness is detected, d) if any sign of degradation has been detected so far, provide, e) justify why VT, and VT-3 visual inspections as recommended by GALL is not needed at Palisades.

Question B2.1.10-011 NRC Response 7-19-05

Response is NOT acceptable. The applicant's response primarily focuses on the qualification of personnel. The Project Team's question was intended to focus on the actual inspection methodology. Please provide a technical justification as to how the visual inspection that the applicant is claiming to be equivalent to is equivalent and assures the same level of flaw identification and documentation as would be achieved by VT-1 and VT-3.

Final Response:

Update: Fire Barrier Penetration Seal Inspection Surveillance Procedure FPSP-RP-11 section 3.5 delineates specific skill and qualification requirements for personnel performing inspections of penetration seals. In general, these personnel are required to be experienced or trained in determining the integrity, and recognition of degradation of each of the different types of seals that they are inspecting. All training will be documented by the Fire Protection Engineer. Sections 5.2 through 5.8 of this procedure contains detailed inspection criteria, and inspection methods for each of the different seal types. These requirements are essentially equivalent to the level of detail required for a VT-1 inspection conducted under the ASME ISI program. Palisades will withdraw this exception to the NUREG-1801 section XI.M26 Fire Protection Program, and state the above as being equivalent to a VT-1 inspection. 6/22/05

7-6-05 .This information was discussed with auditor.

Fire Barrier Penetration Surveillance, FPSP-SP-11, Revision 6 contains the following:

3.5.1 ☐ Performance

a. ☐ Person or persons conducting this surveillance (referred to in the procedure as "inspector") shall have experience or training in determining the integrity of fire barrier walls, ceilings, and floors.

b. ☐ Person or persons conducting this surveillance (referred to in the procedure as "inspector") shall have experience or training in recognition of the following materials and components as related to fire barrier penetration seals and conduit seals. Training will be documented by the Fire Protection Engineer.

1. ☐ Cellular Concrete/Grout

2. ☐ Ceramic Fiber material including Kaowool (B&W) and Cerafiber (Johns-Manville)

3. ☐ Noncombustible Damming material including Kaowool and Kaowool M Board (B&W), Ceraflite, Cerafiber and Marinite I Thermal Panels (Johns-Manville)

4. ☐ Mastic coatings including Flamemastic 77 (Flamemaster)

5. ☐ Silicone Foam material including Dow-Corning 3-6548

6. ☐ Caulks including 3M Brand CP 25 N/S

7. ☐ Adhesives/Sealants including Dow Corning 96-081 RTV and 9-1285 Silicone Sealant

8. ☐ Typical fire barrier penetrations including: cable tray, conduit, pipe, tubing, and ductwork

c. ☐ Person shall be experienced or trained in the interpretation and use of fire barrier location drawing (P&ID Drawings M-216 Sheets 4 through 18)

Based on the above information, the qualification of personnel performing Fire Barrier inspections at Palisades would be equivalent to VT-1 requirements.

Summary Report of License Renewal Review Questions for: AMP Audit

Inspection and Testing of Palisades Plant Fire Doors, FPSP-SO-2, Revision 2

3.5□ Minimum Personnel Skill Level

3.5.1□ Performance

Personnel performing this inspection are required to have the skill level of an Auxiliary Operator

Auxiliary Operators are qualified as VT-2 inspectors. They are qualified to perform the procedure for inspection of the Fire Doors.

Based on the above information, the qualification of personnel performing Fire Door inspections at Palisades would be equivalent to VT-3 requirements.

Therefore, the exception to NUREG-1801 is being withdrawn.

Palisades does not test or inspect seal material for shrinkage or hardness but rather inspects for the results from shrinkage and hardness (Gaps, Cracks).

NMC Follow-up response.

During the NEI/NRC May 16, 2005 License Renewal Meeting the NRC discussed some of the changes that would be incorporated into Rev 1 of the GALL. One of the changes discussed was in XLM26 "Fire Protection" that words related to qualification of inspectors has been changed to "qualified inspectors" rather than "VT-1 or equivalent". I think that this supports our previously stated position.

We have also done some additional reviews into the Code descriptions of VT-1 and VT-3 which may be useful in your reviews.

ASME Section XI, IWA-2300, Examination Methods lists IWA-2211, VT-1 Examination and IWA-2213, VT-3 Examination. Therefore, VT-1 or VT-3 is not a qualification but an inspection method. IWA-2211, VT-1 Examination states: "VT-1 examinations are conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, or erosion." IWA-2213, VT-3 Examination states: "VT-3 examinations are conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearances, settings, and physical displacements; and to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear, or erosion. VT-3 includes examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring type supports." The ASME Section XI Code identifies specific inspection and acceptance criteria to apply to various systems/components (ie. IWB-3520.1, IWB-3520.2) when using a VT-1 or VT-3 examination. The Palisades procedures for inspecting fire barriers, fire doors, and fire seals contain the specific inspection and acceptance criteria. The inspection requirements and acceptance criteria are documented in the procedure and the procedures are signed off as acceptable or the unacceptable condition is documented on a condition report and repaired or replaced as required. Palisades considers this as equivalent to VT-1 or VT-3 examinations as used in ASME Section XI. This is consistent with the requirements of NUREG-1801.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: LRA states that fire doors are periodically tested. However, the frequency of functional tests are not provided. Provide documentation that show frequency and adequacy of fire doors functional test.

Final Response: The PBD states the inspection interval as semi-annually. The procedures for completing these inspections are also referenced in the PBD. 6/21/05

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Provide details on the diesel driven fuel pump tests. Provide an example of the test results.

Final Response: with the NUREG-1801 statement, "The diesel-driven fire pump inspection program requires that the pump be periodically tested to ensure that the fuel supply line can perform the intended function". In the LRA transmittal letter dated March 22, 2005, Attachment 2, Commitment 22, NMC made a commitment to, " Revise diesel-driven fire pump performance test procedures to more specifically address requirement to inspect and monitor fuel oil supply line for aging related degradation, and to document inspection results." As discussed in LRA Section B2.1, the LRA describes programs as if enhancements have been incorporated. The program, when enhancements are complete, will be consistent with the quoted NUREG 1801 statement.

Since the Fire Protection Program presently does not contain a specific inspection of the diesel driven fire pump fuel supply lines, there are no test results available for review.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide documents showing trending for fire doors inspections.

Final Response: Update: Trending of Fire Door Inspections is not required by NUREG-1801. However, trending is an inherent aspect of the Corrective Action Program. If repetitive problems were occurring with fire doors these would be identified by an adverse trend Corrective Action Item, which would require an evaluation. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide documents showing trending for fire barriers inspections.

Final Response: FPSP-RP-11 and EA-FPP-03-05 6/21/05

Update: Trending of Fire Barrier Inspections is not required by NUREG-1801. However, trending is an inherent aspect of the Corrective Action Program. If repetitive problems were occurring with fire barriers these would be identified by an adverse trend Corrective Action Item, which would require an evaluation. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide documents showing trending for fire pump testing (for example pressure).

Final Response: .RO-52, MO-7B 6/21/05

Update: Trending of Fire Pump performance is not required by NUREG-1801. However, trending is an inherent aspect of the Corrective Action Program. If repetitive problems were occurring with fire pumps these would be identified by an adverse trend Corrective Action Item, which would require an evaluation. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Provide justification for acceptance of cracks no wider than ¼". Identify where any cracks or defections in seals have been observed

Question B2.1.10-017 NRC Follow-up 7-19-05

Response is NOT acceptable. Only the first two sentences of the applicant's response touch on the essence of the Project Team's question. The subsequent sentences of the applicant's response address history and what actions are taken should a crack larger than ¼ inch be identified during and inspection. The focus of the Project team's question is a request for the applicant to justify why the ¼ inch wide crack is technically acceptable. Furthermore, neither of the first two sentences provides a satisfactory justification as to why this size crack is acceptable. The response only provides a comparison to the gap permitted at the bottom of a fire door. It is not clear to the Project Team why a ¼ inch crack in a fire seal would respond during a fire in a manor similar to the gap at the bottom of the fire door. Please enhance the response to characterize the technical basis for accepting the ¼ inch crack. Without such a technical justification, the project team will not be able to accept the exception proposed by the LRA.

Final Response:

LRA Section B2.1.10, Fire Protection Program, Exceptions to NUREG 1801, is hereby revised to delete exception 3 on page B-73. In addition, Acceptance Criteria on page B-79 is hereby revised to read as follows:

"Acceptance criteria are defined in the Palisades procedures used to perform tests and inspections of the Fire Protection System. Fire seal and conduit wrapping inspection results are acceptable if there are no visual indication of cracking, separation of seals from building structures and components, and no rupture or puncture of seals. Fire door inspection results are acceptable if there are no visual indications of wear, holes, damaged or missing parts, and clearances are within limits. Diesel-driven fire pump inspections are acceptable if there is no evidence of corrosion or leaks on the fuel oil supply line. Acceptance criteria for the diesel-driven fire pump capacity is contained within the test procedure.

This element is consistent with NUREG-1801, Sections X1M26, "Fire Protection" as clarified by ISG-4.

This element is consistent with NUREG-1801, Sections X1M27, "Fire Water System" as clarified by ISG-4."

The balance of this question was discussed during the on-site interview and need not be docketed.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: GALL states that no corrosion is acceptable in the fuel supply line for diesel- driven fire pump. LRA states that acceptance criteria for the diesel-driven fire pump capacity is contained within the test procedure. Provide acceptance criteria for fuel supply line for diesel driven fire pump to show consistency with the GALL.

Final Response: In the LRA transmittal letter dated March 22, 2005, Attachment 2, Commitment 22, NMC made a commitment to, " Revise diesel-driven fire pump performance test procedures to more specifically address requirement to inspect and monitor fuel oil supply line for aging related degradation, and to document inspection results." As discussed in LRA Section B2.1, the LRA describes programs as if enhancements have been incorporated. While the specific acceptance criteria have not yet been developed, this element will be consistent with NUREG-1801, Section XI.M26, Fire Protection System as clarified by ISG-04 upon completion of this enhancement.

See the response to NRC Question 18 for additional relevant information. Note that this response removes the exception defined in the LRA on page B-79 for Acceptance Criteria.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide documents for details on Water tight fire door seal degradation.

Final Response: This should be an OE document, but we have later determined that a solid metal door is no tin scope. Complete 6/21/05 Update: Refer to CAP000548, which states, "During the watertight barrier inspection under work order #24414960 PPAC MSM071, we have identified a considerable number of these barriers that did not pass their seal integrity test. Watertight doors that failed tests are as follows: Doors 142, 167, 170, 59, 58, 51. These doors failed chalk test. 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain whether degradation similar to industry experience has been observed at Palisades (as they were referred to in the documents listed in the GALL).

Final Response: Check the specific reference and the OE database. 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Section B2.1.10 of the LRA describes the aging management program for Fire Protection and identifies three exceptions to NUREG-1800. These exceptions do not list any exceptions with the frequencies of surveillance of the structures, systems and components identified as being in scope and requiring aging management. Verify that no exceptions are taken from the surveillance frequencies identified in NUREG -1800, Section XLM26.

Final Response: The attachment 9.4 to the PBD provides the path between the GALL and the ISG requirements and how the ISG testing or surveillance intervals are applicable.
BGB 6/21/05 Update: Palisades has no exceptions to the surveillance frequencies identified in NUREG-1801, section XLM26 as clarified by ISG-04. 6/22/05
2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Elaborate on the differences between NFPA monitoring and trending against PNP FP implementing procedures.

Question B2.1.10-22 NRC Follow-up 7-19-05

Response is acceptable. This needs to be captured in the LRA revision.

Final Response:

Based on discussions during the interview and a detailed review of the applicable sections of NFPA-25, it has been concluded that Palisades complies with the specific monitoring and trending of results as specified in NFPA-25. This new understanding serves as the basis for not taking exception to the GALL on this issue. NMC's review of NFPA-25 for monitoring and trending of system performance testing identified two sections where requirements are stated.

NFPA-25 step 5-3.5.2 states that the pump test curve shall be compared to the unadjusted field acceptance test curve and the previous annual test curves.

This guidance is demonstrated in the fire suppression water system functional test and fire pump capacity test procedure which states, "This procedure facilitates trending hydraulic performance of Fire Pumps P-9A, P-9B, and P-41, including comparison of current pump performance with original and historical pump performance."

NFPA-25 step 4-3.1 states that underground and exposed piping shall be flow tested to determine the internal condition of the piping at minimum 5-year intervals. Flow test shall be made at flows representative of those expected during a fire for the purpose of comparing the friction loss characteristics of the pipe with those expected for the particular type of pipe involved, with due consideration given to the age of the pipe and to the results of previous flow tests. Any flow test results that indicate deterioration of available water flow and pressure shall be investigated to the complete satisfaction of the authority having jurisdiction to ensure that adequate flow and pressure are available for fire protection.

This testing guidance is demonstrated in the fire suppression water system flow test procedure, which states, "To determine operability of fire suppression water system by performing a flow test to determine if there is any system degradation or obstruction. The procedure contains acceptance criteria and requirements to initiate a condition report if acceptance criteria are not met." Flow testing is required to be performed every three (3) years.

The Palisades program meets the requirements as identified above. Continued implementation of this program provides reasonable assurance that the effects of aging of the applicable components will be adequately managed for the period of extended operation.

Based on the above, the exception taken to the NUREG 1801 XI.M27 and ISG-04 under Monitoring and Trending is hereby withdrawn and the following changes are made to the LRA.

On page B-73 of the LRA delete exception #2 and replace with Not Used..

On Page B-78 and B-79 under Monitoring and Trending, replace the last paragraph, including the exception bullet, with the following statement: "Results of system performance testing are monitored and trended as specified by NFPA codes and standards. The element is consistent with Section XI.M27, "Fire Water System" as clarified by ISG-04.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Appendix A should be revised to identify exceptions and enhancements.

Question B2.1.10-023 NRC Follow-up 7-19-05

This is a generic question. This is an open issue until a decision is made on how to capture enhancements to the AMPs for the license renewal (i.e., in Appendix A or a commitment list). During the interviews, the auditor asked the applicant to add the industry/NRC's new position on underground piping inspection to the response to this question. Note that selective leaching is applicable to the underground piping that is managed by the fire protection AMP. Therefore, selective leaching mechanism should be discussed here.

Final Response: Update: Enhancements will be tracked as commitments & are identified as such in LRA transmittal letter. Question whether commitments should be included in App. A was received as RAI A1.0-1 issued 6/3/05.

See response to RAI A1.0-1 provided in NMC letter dated July 1, 2001. RAV 7/11/05

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: LRA states that the program focuses on managing loss of material due to corrosion, MIC, or biofouling of carbon steel and cast-iron components exposed to water. However, LRA Table 3.3.2-7 lists bare copper, bronze, copper alloy and stainless steel components in raw water as the components that their aging effects are managed by fire protection AMP. Clarify this discrepancy.

Final Response: The Fire Protection Program is intended to include all materials/components of Table 3.3.2-7 that credit the Fire Protection Aging Management Program. The last sentence of the first paragraph of Scope of Program on page B-74 is hereby revised to read, "The program focuses on managing loss of material due to corrosion, MIC, or biofouling of components; and aging management of fire barrier components."

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL XLM27 program lists nozzles, hydrant, hose stations, standpipes as components that their aging effects are managed by this program. LRA Table 3.3.2-7 does not include any of these components as component groups subject to an AMR. Clarify whether these components are listed in another AMR table or included in a component group listed in this table. If not, explain why.

Final Response: Update: These roll up to "Pipe and Fittings" and "Valves and Dampers" in the LRA Table 3.3.2-7. 6/22/05 2000

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide implementing procedures to show the frequency of preventive measures. Also present documentation to show effectiveness of these preventive action.

Final Response: The PBD has the answer. Similar to the preventive measures that we gave procedure references for earlier.
BGB 6/21/05 Update: Update: Palisades has no exceptions to the surveillance frequencies identified in NUREG-1801, section XLM27 as clarified by ISG-04. Fire Hydrant flushes and verification of unrestricted flow are conducted annually per FPSP-SO-3. 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: If Palisades in-service Inspection Program is credited by the fire protection AMP, the ISI program should also be listed in the AMR tables as a program(s) managing aging effects with the fire protection program. Clarify.

Final Response: Update: The Fire Protection System is included in the Palisades Risk-Informed ISI program. There are sections of the FP system that are volumetrically examined under the RI-ISI program. Hence, the Fire Protection Aging Management Program credits this aspect of the existing ISI program to fulfill these requirements of NUREG-1801, section XI.M27 as clarified by ISG-04. 6/22/05 2000

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: LRA states that the Fire Protection Program credits the Non-EQ Electrical Commodities Condition Monitoring Program for aging management of these components. However, the fire protection AMP is not listed in LRA Table 3.6.2-1 as a program that manages aging effects of Non-EQ cables. Clarify.

Final Response: The Non-EQ commodities is the correct program. 6/21/05 Update: The only passive component in the Appendix R Spare Parts program that requires aging management is the spare cable. This cable is age-managed under the Non-EQ commodities program as a commodity, and will not specifically be called out in the LRA tables. However, this cable is specifically discussed in the Non-EQ commodities Program Basis Document. 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: ISG-4 recommends that Wall thickness evaluations of fire protection piping are performed on system components using non-intrusive techniques (e.g., volumetric testing) to identify evidence of loss of material due to corrosion. Palisades credits the One-Time Inspection Program for aging management of RCP oil collection tank, piping and valve bodies for wall thickness and aging related degradation. This should be considered as an exception to ISG-4. Clarify. See question B2.1.10-28

Final Response: ISG-04 refers to the fire water program which this is related to. The oil collection system is not a part of XLM26 and we're monitoring using one time on this system that is in a different environment than that for fire water. 6/21/05 Update: The RCP oil collection system is an Appendix R requirement, which is related to Fire Protection, which is why it is included in the Fire Protection Aging Management Program. There are no specific aging management requirements delineated in the GALL for this system. So, crediting the One-Time Inspection Program is satisfactory. 6/22/05 2000

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL recommends that system discharge pressure is monitored continuously. LRA also states that pressure will be continuously monitored. Provide examples of pressure monitoring. Identify instances when measured pressure was outside the acceptable range, if any. Describe corrective actions.

Final Response: Update: Palisades continuous monitoring of fire water system pressure is consistent with the GALL requirements as clarified by ISG-04. Fire water system pressure is maintained by a jockey pump. If pressure in the system drops due to a leak or break in the system, then the jockey pump would not be able to keep up with the flow rate and pressure would drop. This would cause the fire pumps to start. The low pressure and fire pump starts would cause alarms in the control room, which is continuously manned. There have been no instances of fire pump starts due to age-related degradation of components. 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide justification for not using NFPA codes and standards for monitoring and trending the results of system performance testing

Final Response: Similar to 22? 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide procedures that specify the frequency of the fire water piping surveillance tests.

Final Response: This is an implementation issue that we have yet to implement. Check commitments in the cover letter? FPIP-4 Attachment 8, FPIP -5 (list) 6/21/05 Update:

Quarterly Tests

- FPSP-QO-2, "FIRE Protection Sprinkler System Water Flow Switch Alarm Surveillance Test"
- FPSP-QO-4, "Quarterly Dry Pipe Fire System Alarm/Flow"
- FPSP-QO-3, "Transformer Deluge Systems Surveillance Test"

Semi-Annual Tests

- FPSP-SO-4, "Fire Suppression Water System Post Indicator Valve Operation"

Annual Tests

- RO-52, "Fire Suppression Water System Functional Test and Fire Pump Capacity Test"
- FPSP-SO-3, "Fire Suppression Water System Fire Hydrant Flush"

18-month Tests

- FPSP-RO-9, "Fire Sprinkler System Inspection"

Refueling Tests

- FPSP-RO-15, "Full Flow Test – Transformer Deluge System"

3-year Tests

- FPSP-RO-10, "Fire Suppression Water System Flow Test" 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Table 3.3.2-7 lists "valves and dampers" in addition to "piping and fittings" as a component group with soil external environment. Explain how loss of material aging effect of valves will be managed by the fire protection AMP. In addition, similar to buried piping and tanks AMP, add NRC's new position on inspection of underground piping and valves.

Final Response: The reference to the Valves and Dampers should have been include under the piping and fittings reference as there is no separate set of requirements for valves and dampers verses piping and fittings.
The new commitment will apply.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide details for the criteria for the diesel-driven fire pump capacity is contained within the test procedure. Provide example of instances that the diesel driven fire pump capacity was outside the acceptable criteria. Provide resolutions to these instances.

Final Response: We can provide results in addition to the enhancement 7.1.4 statement. 6/21/05 Update: Refer to Enhancement 4. Detection of Aging Effects, and Monitoring and Trending: Revise diesel-driven fire pump performance test procedures to more specifically address requirement to inspect and monitor fuel oil supply line for aging related degradation, and to document inspection results. 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide details (date of event, description, root cause analysis, resolutions, corrective actions, and the follow up actions for the events listed in LRA for operating experience. Explain whether any of these events resulted in the revision of the fire protection program.

Final Response: Update: OE is included in the supporting information binder for the Fire Protection Aging Management Program. This OE includes a complete description of each item, and how it was resolved. 6/22/05 2000

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain how biofouling/build up of deposit aging effect in piping and components is detected and monitored by the fire protection AMP.

Final Response: The answer is in the PBD for how this is managed. Wall thickness. 6/21/05 Update: The Fire Protection Aging Management Program credits Palisades ISI program, which includes fire protection, and performs volumetric inspections of selected portions of the system. 6/22/05 2000

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: In GALL the staff recommends that if "degradation is detected such that the wall thickness is less than the minimum predicted thickness, additional examinations are performed in adjacent areas to bound the thinning." The LRA states that "if inspection results indicate a higher than expected wear rate that is inconsistent with the predicted wear rates, the reason for those inconsistencies are investigated. As part of the evaluation, an updated FAC analysis is performed, and additional investigations conducted, to determine the extent of the unpredicted wear rates." It is not clear to the staff that investigation without physical examinations in adjacent areas may be intended. Please confirm that "additional investigations" will always include additional examinations in adjacent areas or justify this exception to the GALL AMP.

Final Response: Additional exams are performed in adjacent areas. EM-09-08 and FP-PE-FAC-01 5.6.6 and CD-517. 6/21/05

UPDATE:

Both documents provided during interview: 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: In GALL the staff suggests that a predictive computer code, such as CHECWORKS, be used to calculate the number of refueling or operating cycles remaining before a component reaches the minimum allowable wall thickness. The LRA states that "CHECWORKS™ is used to determine if the remaining life is shorter than the amount of time until the next inspection. An engineering evaluation is also performed to determine acceptability. Activities are then planned and executed if the engineering evaluation determines repair or replacement is necessary." The staff notes that this is not consistent with the GALL report and may reduce the planning window for appropriate action. Please confirm that the number of cycles remaining is determined and assessed. Otherwise, justify the discrepancy as an exception.

Final Response: This is the criteria that is used if an exception is kicked out of checkworks. Checkworks does calculate the number or remaining cycles. See sheet. 6/21/05
Update: Provided an example checkworks results sheet that showed that the remaining cycle life is calculated as part of very report 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the Basis document for FAC program.

Final Response: This can be obtained Em-09-08 6/21/05

UPDATE:

This document provided. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the Record of review of CHECWORKS implementation in light of IN 97-84

Final Response: Program Notebook 6/21/05 Update: This was information provided during the interview 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the Record of baseline inspection for FAC.

Final Response: Master inspection Manual. John will bring. 6/21/05 Update: OK This was provided as part of the interview 6/22/-5 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the most recent two reports (internal reports) on the PNP FAC program of the type that were reviewed by the applicant

Final Response: I have the field observation report which is the last two volumes of the five volume report. 6/21/05 Update: This information was reviewed as necessary 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the most recent condition report making reference to FAC.

Final Response: CAP 043865, need to get. 6/21/05 Update: A copy of the CAP was provided from the program owner notebook. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-001
How the accessible medium voltage cables aging will be managed?

Final Response: See page 3 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

All cables are managed as part of a spatial cable commodity. The Scope of Program section has been revised to incorporate the commodities Cables and Connections and Low Signal Sensitive Instrumentation Cables and Connections

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain why low-voltage electrical pinned connectors are identified as a separate item. Aren't these part of electrical connections?

Final Response: Pin connector insulation material that are part of the electrical connection will be inspected under the XIE1 Program.
Per LRA B2.1.12 pg B-87
Electrical pinned connectors are subject to pin corrosion from boric acid leakage, and periodic inspections are conducted in the Boric Acid Corrosion Program to preclude failures resulting from leakage. They will be evaluated using the Boric Acid Program attributes. 09:00 6/23/2005

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify instrumentation circuits that are covered by this program.

Final Response:

LR-AMR-ELT Attachment 8.12
FM-1039 (Pressurizer Safety Flow Monitor),
FM-1040 (Pressurizer Safety Flow Monitor),
FM-1041 (Pressurizer Safety Flow Monitor),
FM-1042B (Pressurizer Safety Flow Monitor),
FM-1043B (Pressurizer Safety Flow Monitor),
NI-5 (Power Range Safety Channel),
NI-6 (Power Range Safety Channel),
NI-7 (Power Range Safety Channel),
NI-8 (Power Range Safety Channel),
RE-0833 (Service Water Radiation Detector)
RE-1049 (Liquid Batch Radiation Monitor)
RE-1113 (Waste Gas Process Monitor)
RE-1805 (Containment Isolation Monitor)
RE-1806 (Containment Isolation Monitor)
RE-1807 (Containment Isolation Monitor)
RE-1808 (Containment Isolation Monitor)
RE-1809 (Radwaste Exhauster)
RE-2321 (Containment Gamma Left Channel)
RE-2322 (Containment Gamma Left Channel)

The WR NI-1/3 and 2/4 are part of the EQ Program. The WR consists of the source and IR detection. Per the FSAR 7.6.2.2 the WR is described: The WR nuclear instrumentation portion uses ... to monitor over 10 decades of flux from 10 E-8% full power to 200 % FP. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: What is the voltage level for the instrumentation circuits ?

Final Response: FM-1039 - 1042B * 18Vac
NI-5 - 8 * 600Vac
RE-0833 *200 millivolts to 6 Volts then amplified to -12 volts
RE-1049 *6 volts then amplified to-12 volts
RE-1113 *2 volts then after passing thru the Preamplifier -1.8 volts
RE-1805 *DC Current signal10EE-11 to 10EE-6 Amps
RE-1806 *DC Current signal10EE-11 to 10EE-6 Amps
RE-1807 *DC Current signal10EE-11 to 10EE-6 Amps
RE-1808 *DC Current signal10EE-11 to 10EE-6 Amps
RE-1809 *2 volts then after passing thru the Preamplifier -1.8 volts
RE-2321 *Current Signal 6.5 to 7.5 EE-11 TO 6.5 to 7.5 EE-4 Amps
RE-2322 *Current Signal 6.5 to 7.5 EE-11 TO 6.5 to 7.5 EE-4 Amps 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: How the aging of connections associated with these cables will be managed?

Final Response: Yes the cables and connections will be in the circuit during testing.
Per LRA B2.1.12 (B-87, -88)
NUREG-1801 Program XLE2, "Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits" requires routine calibration tests to be performed to identify potential existence of aging degradation of cables and connections used in low-level signal applications that are sensitive to reduction in insulation resistance (IR) such as radiation monitoring and nuclear instrumentation. This is revised as discussed in draft ISG-15 which allows testing once every 10 years in lieu of TS surveillance test trending. 6/21/05, 9:38 6/23/2005

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-006
Identify the cables involved in this program.

Final Response: The following cables are included:

A1103 (SERVICE WATER PUMP P7B BREAKER NO. 152-103),
A1105 (2400V. BUS #1C INCOMING FROM SAFEGUARDS BUS Breaker #152-105)
A1106 (2400V. BUS #1C INCOMING FROM STARTUP TRANS., BRK #152-106)
A1202 (2400V. BUS #1D INCOMING FROM STARTUP TRANS BRKR #152-202)
A1204 (SERVICE WATER PUMP P7A BREAKER NO. 152-204)
A1205 (SERVICE WATER PUMP P7C BREAKER NO. 152-205)
A1303 (2400V BUS #1E INCOMING FROM STARTUP TRANSFORMER BRKR #152-303)
A2102 (4160V. BUS #1A INCOMING FROM STARTUP TRANS BRKR #252-102)
A2202 (4160V. BUS #1B INCOMING FROM STARTUP TRANS BRKR #252-202)
A2302 (4160V BUS #1F S/U POWER BRKR #252-302)
A2402 (4160V BUS #1G S/U POWER BRKR #252-402)
F95 (SAFEGUARDS SCHEMES)

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain how the inspection only without draining water will minimize prolonged moisture conditions.

Final Response: The inspection will initiate the corrective action required to pump out the water.
See response to B2.1.12-25
6/21/05, 9:39 6/23/2005

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarify that the visual inspection will include all accessible electrical cables and connections installed in adverse localized environments.

Final Response: The inspection will include an inspection of all accessible insulated cables and connections.
Per LRA B2.1.12 pg B-91
A periodic visual inspection will be performed of accessible insulated cables and connections in-scope of License Renewal that may be subjected to a localized adverse environment. A localized adverse environment is defined as when any electrical insulation material is exposed to an aging environment that is significantly greater than the bounding design parameter value.
(All cables are part of a spatial cable commodity. If the buildings/structures is in scope this commodity will be in scope and will be visually inspected via the XLE1Program. Once they leave the building they will only be in scope if the building/structure is in scope.) 6/21/05, 09:39 6/23/2005

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-009
Explain the difference between significantly greater than the bounding design parameter value and significantly more severe than specified service environment for the cable.

Final Response: Bounding design parameter has the same meaning as specified service environment. The terms are used interchangeably.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain what parameters will be monitored by this inspection.

Final Response:

Per LRA B2.1.12 pg B-92

The accessible insulated cables and connections shall be visually inspected for insulation/jacket surface anomalies, such as discoloration, swelling, cracking, or surface contamination. (Note embrittlement was not used and is not needed as it is an OR statement in the GALL.) 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: No actions are taken as part of this testing program to prevent or mitigate aging degradation. This is part of Preventive Actions and shall be deleted from this element.

Final Response:

OK This is additional information that is not required in this location. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain what parameters will be monitored by this testing program.

Final Response: Per LRA B2.1.12 pg B- 91
This is a periodic testing program to check insulation condition. (So the condition of the insulation of the cables is what will be monitored.)
Per LRA B2.1.12 pg B-92
Cables used in nuclear instrumentation circuits are to be periodically tested (such as insulation resistance tests, time domain reflectometry tests, or other tests effective in determining cable insulation condition), at least once every ten years to provide an indication of the condition of the insulated conductor and connection, and the ability of the circuit to perform its intended function. 6/21/05

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-013
Provide the type of test to be performed for detecting deterioration of the insulation system.

Final Response: See Page 8 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The last bullet under Detection of Aging Effects has been revised in response to this question.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain how the inspection only without draining water will minimize prolonged moisture conditions.

Final Response: See response to B2.1.12-25
The program will initiate corrective action to pump out the water. 6/21/05, 09:41 6/23/2005

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-015
Explain how loose connection will be identified without thermography or resistance measurement.

Final Response: See pages 5 and 6 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The first bullet under Parameters Monitored, Inspected and/or Tested has been revised, and a new second bullet added, in response to this question.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: How cracks, corrosion, foreign debris etc. will be identified without internal inspection.

Final Response: See response to B2.1.12-015 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: How insulating system aging effects will be managed?

Final Response: See response to B2.1.12-015 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: How aging effects of internal bus supports will be managed?

Final Response: See response to B2.1.12-015 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-019

Provide details experience that is the basis for the statement that aging degradation is a slow process. GALL requires an engineering evaluation to be performed to determine test interval.

Final Response:

See page 7 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The second bullet under Detection of Aging Effects has been revised in response to this question.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: GALL requires that all circuits in the scope of this program will be tested. Will all cables and connections in the scope of this program be tested?

Final Response:

All cables and connections in this program will be tested.

Per LRA B2.1.12 pg B-88

The Non-EQ Electrical Commodities Condition Monitoring Program does subject sensitive instrumentation circuits, identified as requiring aging management, to periodic testing. 6/23/2005

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify the circuits that are in the scope of this program.

Final Response: See response to B2.1.12-003 6/21/05 Response to information request number 177.

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-022
GALL requires that all circuits in the scope of this program will be tested. Will all cables and connections in the scope of this program be tested?

Final Response: Periodic testing will be performed on all these medium voltage cables to provide an indication of the insulation condition. The cables will be tested with the connections made up, as the test leads are connected at the breaker connection point.

See page 8 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question. The third bullet under Detection of Aging Effects, first paragraph, last sentence, has been deleted in response to this question.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify the circuits that are in the scope of this program.

Final Response: See response to B2.1.12-006 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide basis for the tests identified such as insulation resistance, TDR etc. How the above mentioned test s will identify medium-voltage cable degradation?

Final Response: See response to B2.1.12- 013 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-025

Modified GALL requires that inspection frequency is based on actual field data but not to exceed 2 years. Provide manhole inspection frequency. Provide inspection results of underground manholes if available. Provide a copy of the inspection program if available.

Final Response:

See page 8 of Enclosure 2 for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The last bullet under Detection of Aging Effects has been revised in response to this question. Note that there is currently no formal inspection program, so no inspection results are available.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarify that all manholes are inspected for water accumulation.

Final Response:

This will only cover manholes that have cables that are In Scope for License Renewal. The list of applicable Non-EQ Medium Voltage Cables is provided in response to B2.1.12-006 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Periodic inspections of underground manholes for the accumulation of water around medium-voltage cables shall minimize time periods of exposed to water. This is not acceptance criteria. Acceptance criteria shall be free from water. Modify accordingly.

Final Response: See response to B2.1.12-025 6/21/05, 09:43 6/23/2005

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-028
Palisades program B.1.2, "Quality Assurance Program and Administrative Controls" does not address the special requirements identified in GALL XI. E1, E2, E3, and E4 program. Address these requirements.

Final Response: See pages 9, 10 and 11 of Enclosure 2 [of 8/25/05 letter to NRC] for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The element Corrective actions has been revised in response to this question.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-028-1

Palisades program B.1.2, "Quality Assurance Program and Administrative Controls" does not address the special requirements identified in GALL XI. E1, E2, E3, and E4 program. Address these requirements.

Final Response:

See pages 9, 10 and 11 of Enclosure 2 [of 8/25/05 letter to NRC] for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The element Corrective actions has been revised in response to this question.

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-028-2

Palisades program B.1.2, "Quality Assurance Program and Administrative Controls" does not address the special requirements identified in GALL XI. E1, E2, E3, and E4 program. Address these requirements.

Final Response:

See pages 9, 10 and 11 of Enclosure 2 [of 8/25/05 letter to NRC] for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The element Corrective actions has been revised in response to this question.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: B2.1.12-028-3

Palisades program B.1.2, "Quality Assurance Program and Administrative Controls" does not address the special requirements identified in GALL XI. E1, E2, E3, and E4 program. Address these requirements.

Final Response:

See pages 9, 10 and 11 of Enclosure 2 [of 8/25/05 letter to NRC] for a revised LRA Section B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program which incorporates the response to this question.

The element Corrective actions has been revised in response to this question.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide the basis document for OTI program.

Final Response:

Complete. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: 10CFR54.21(d) requires a summary description of the programs and activities for managing the effects of aging for license renewal. The LRA states that the aging management of the bottom surface of carbon steel tanks will be managed using the OTI program in lieu of GALL AMP XLM29, but there is no commitment to that effect in Appendix A of the application. Please revise the FSAR summary description of the OTI program to include an explicit commitment to that effect.

Final Response: The final paragraph of LRA Section A2.13 One-Time Inspection Program is hereby revised to include a fifth bullet as follows:

This program is used for a variety of purposes, including the following:

- ☐ ...
- ☐ ...
- ☐ ...
- ☐ ...
- ☐ To verify, for carbon steel storage tanks supported on earthen or concrete foundations, that excessive corrosion is not occurring on the bottom surfaces of the tanks.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Evaluations (RI-ISI or other) assessing degradation mechanisms and bounding locations for aging of small-bore pipe.

Final Response: Update: We had a discussion on small-bore pipe, which included how we arrived at our selection of 6 high safety significant butt welds to inspect under the one-time inspection program. The discussion also raised some question about our risk informed ISI program, which will be addressed outside of the auspices of the OTI program. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Identify all Class 1 small-bore piping including pipe sizes, material, and type of weld. (If the information is in an electronic form that will be accessible to plant staff during an interview with the audit team, hard copy may not be necessary.)

Final Response: Update: I believe that this was successfully addressed during the interview 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Criteria to be used for sample size expansion in the event OTI identifies degradation.

Final Response: This has not been determined yet as the OTI program has not been developed. 6/21/05 Update: We will be using the EPRI methods for sample size and expansion as a basis for our one-time inspection program. The type of inspections being performed was also the subject of an RAI. That RAI will describe our position on the type of inspections that will be performed. The RAI question should give us a way to answer the question without committing to a draft document. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide a copy of the basis document for this AMP.

Final Response: Update: A copy of the program basis document for Closed Cycle Cooling Water program was provided. WLR 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The GALL Report AMP XI.M20 states that the program relies on implementation of the recommendations of Generic Letter 89-13 to ensure the effects of aging will be managed. However, in the PNP LRA, the applicant states that recommendations (d) a system walkdown inspection to ensure compliance with the licensing basis, and (e) a review of maintenance, operating and training practices and procedures were conducted as part of the generic letter response and are not associated with the on-going management of aging. Please justify not listing this as an exception to the GALL AMP.

Final Response: Reviews have determined that the original statements in the Scope of Program discussion concerning implementation of recommendations (d) and (e) noted above were not correct. These activities are included in existing plant procedures as part of the ongoing management of aging, and are not an exception to the GALL.

Therefore, the second paragraph under LRA Section B2.1.14, Scope of Program, ("GL 98-13 required ... Water Program.") is hereby deleted.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The GALL Report AMP XLM20 states that NRC Guidelines for Generic Letter 89-13 include "a test program to verify heat transfer capabilities." The LRA AMP specifies heat exchanger testing but does not specify what type of testing. Please provide documentation of the type and frequency of heat exchanger testing included in the Open Cycle Cooling Water Program.

Question B2.1.14-003 NRC Follow-up 7-19-05

Response is NOT acceptable. The Testing frequency of the Shield Cooling System heat exchanger is not addressed. GALL recommends a maximum interval of five years for the heat exchanger performance testing. Is it the applicant's intent to reduce the inspection frequency to a 5 year periodicity?

Final Response:

A summary of the type and frequency of testing for heat exchangers in scope of the Open Cycle Cooling Water Program for License Renewal is as follows:
Component Cooling Water Heat Exchangers (E-54 A & B) - one heat exchanger is tested using the ET/EPRI single tube test every other outage.

Control Room HVAC condensing Units (VC-10 and 11) are visually inspected once every two years. An additional procedure is completed every eighteen months to demonstrate the cooling capabilities of VC-10 and VC-11.

Engineered Safeguards Room cooling coil (VHX-27A &B) are inspected every other refueling outage.

Emergency Diesel Generators (1-1 and 1-2) jacket water coolers (E-22A&B) are visually inspected every 18 months and flow tested monthly.

Emergency Diesel generators (1-1 and 1-2) Lube Oil Coolers (E-31A&B) are visually inspected every 18 months and flow tested monthly.

Containment air coolers (VHX-1,2,3) cooling coils and are visually inspected every third refueling outage.

Note that the auditor also requested information related to the Shield Cooling Heat Exchanger as a follow up to this question. Shield Cooling is a closed cycle cooling system and beyond the scope of this question, Open Cycle Cooling. See question 14 for the requested information relating to Shield Cooling Heat Exchanger testing.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide clarification as to how pipe sections were selected for flushing.

Final Response:

John Hager is formulating a response.

Discussion 6/21/05 Update: Pipe sections were selected for flushing using a team approach. Representatives from various plant departments including operations and engineering were assembled to form the Sand Silt and Flush team. This team looked at historical data from the service water and fire protection system to determine susceptible areas. The team developed the Master Raw Water Corrosion testing Plan Rev 0 dated June 11, 2003. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide clarification as to how pipe sections were selected for radiography and what criteria is used to indicate the need to flush the lines.

Final Response:

John Hager is formulating a response.

Discussion 6/21/05 Update: Radiography and UT for thinning is completed based on susceptibility and design. Dead legs are usually inspected with radiography. Looking generally for pitting mic and tuberculation. This is part of the raw water corrosion plan. We will be replacing pipe during the next refueling outage based on previous test results. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide clarification as to how operating experience is used to determine what parameters are monitored, inspected or tested

Final Response: Discussion. 6/21/05 Update: The program owners are required to look at and report on OE as part of their system and /or program health reports. The open cycle cooling program owner provided a running log of the OE that had been recently evaluated for the program. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide clarification as to what GL 89-13 commitments are used to determine what parameters are monitored, inspected or tested.

Final Response: Em-09-15 Attachments tables 1 and 2. 6/21/05 Update: The two EM-09-05 tables provide a listing of 89-13 commitments that have been closed and which ones are open. These commitments have served as the basis for our program. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide a couple examples of plant procedures used to implement requirements of GL 89-13 for routine inspection and maintenance of OCCW systems. This response should include examples of both visual inspections and nondestructive testing.

Final Response: Service Water and Fire protection Inspection program Manual. 6/21/05 Update: This information is contained in the master heat exchanger testing program and EM-09-16. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please clarify the use of the term various periodicities in light of the GALL testing frequencies of annual or at refueling outages and provide justification for any testing frequencies that are not consistent with these GALL Report recommendations.

Final Response: Every refout and online equipment is generally every 18 months. 6/21/05 Update: The frequencies for the inspections are contained in EM-09-15 and EM-09-16 for the service water and fire protection systems. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide an example of the Raw Water Corrosion Program Report for review in the context of this element.

Final Response: Raw water program corrosion report. John can get. 6/21/05 Update: Following each refueling outage the raw water corrosion report is generated. An example of the Cycle 16 report was provided. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The PNP LRA does not state which group reviews the heat transfer testing results. The applicant is requested to state which group is responsible for reviewing this information and to provide documentation through an example plant procedure of how this process is implemented.

Question B2.1.14-011 NRC Follow-up 7-19-05
Response is acceptable.

Final Response: No one group reviews the heat transfer testing results. The acceptance criteria is contained in the individual procedures and the engineer responsible for the test evaluates the test results. This may be the system engineer for control room ventilation or the thermal performance engineer for the single tube tests of the component cooling water heat exchanger. The process would be to compare the test results to the acceptance criteria contained in the procedure and report non-conforming or abnormal results via the corrective action procedure. Some of the heat exchanger testing procedures are RT-202 for control room HAVC heat removal capability, and T-390 for single tube testing of the Component cooling water heat exchangers.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The PNP LRA states that the acceptance criteria are provided in plant procedures. Please provide an example of a plant procedure which controls the inspections of components and contains the appropriate acceptance criteria.

Final Response: EM-09-16 Master heat exchanger testing plan, page #14. 6/21/05 Update: The fleet procedure is an example of a procedure that controls the inspection of components and contains the appropriate acceptance criteria. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: The PNP LRA points to the implementation of the GL 89-13 program for over 10 years. Please provide documentation of the commitments made by Palisades in response to GL 89-13.

Final Response: Em-09-15 Attachments #1 and #2 6/21/05 Update: This procedure reviewed during the interview. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide examples from the Corrective Action Program indicating the effectiveness of the Palisades GL 89-13 program.

Final Response: Discussion with John Hager. 6/21/05 Update: The plant has a top ten equipment issues list with the number #1 issue being sand and silting in piping. An effectiveness review is completed each quarter and is known as the service water system silting effectiveness review. This is an example of how issues get escalated for action. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

Provide the administrative procedures for crane operations to ensure that only allowable loads are handled and fatigue failure of structural elements is not expected.

Final Response:

This is handled under MSM-M-13 for the overhead cranes (Containment Polar Crane L-1, Spent Fuel Pool Crane L-3, and Turbine Building Crane L-2).

This is handled under MSM-M-33 for the hydraulic jib cranes (Containment Boom Crane L-6 and Containment Hatch Crane L-906).

I'm not sure if this question is asking how we handle heavy loads but if it is, we handle these under FHS-M-23 in the Spent Fuel Pool and FHS-M-24 in Containment.
6/21/05

UPDATE:

This is handled under MSM-M-13 for the overhead cranes (Containment Polar Crane L-1, Spent Fuel Pool Crane L-3, and Turbine Building Crane L-2). This is handled under MSM-M-33 for the hydraulic jib cranes (Containment Boom Crane L-6 and Containment Hatch Crane L-906). If this question is asking how we handle heavy loads, these are FHS-M-23 in the Spent Fuel Pool and FHS-M-24 in Containment. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question

How frequent are inspections of cranes performed under the CLB?

Final Response:

Presently, our procedures perform more inspections than required by our CLB. Our CLB requirements are to perform inspections per ASME/ANSI B30.2 for our overhead cranes and ASME/ANSI B30.5 for our jib cranes. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question

One enhancement is planned to bring the Overhead Load Handling Systems Inspection Program into conformance with the GALL program description. How is this enhancement tracked to make sure the enhancement will be incorporated into the program?

Final Response:

Commitment tracking 6/21/05

UPDATE:

The plant commitment-tracking program. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question

Palisades states that it tracks the number and magnitude of lifts that exceed the rated capacity of the cranes within the scope of license renewal. These lifts are numerically restricted, and evaluated by engineering analysis. Explain what is meant by numerically restricted. Provide examples of these evaluations and explain where and how the number of above rated capacity lifts are documented on a continuing basis.

Final Response:

Special Over Rated-Load Lifts are scheduled and planned under Periodic & Predetermined Activity Control (PPAC) CLP049. An Engineering Assistance Request (EAR) is submitted to perform the analysis needed to allow these lifts.

Under B30.2 - 1976 which is the required code in NUREG-0612, there is no specified limit for the numerical restriction. Using B30.2 - 1996, the numerical restriction is 2 engineered lifts per continuous 12 months.

EAR # 98-0680, EAR # 99-0156, EAR # 99-0397, CAP036398 6/21/05

UPDATE:

Special Over Rated-Load Lifts are scheduled and planned under Periodic & Predetermined Activity Control (PPAC) CLP049. An Engineering Assistance Request (EAR) is submitted to perform the analysis needed to allow these lifts.

Under B30.2 – 1976, which is the required code in NUREG-0612, there is no specified limit for the numerical restriction. Using B30.2 - 1996, the numerical restriction is 2 engineered lifts per continuous 12 months.

Provided EAR # 98-0680, EAR # 99-0156, EAR # 99-0397, CAP036398 describing evaluation of these lifts. 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question

What qualifications and training of the inspectors are required to perform crane pre-lift corrosion inspections? Explain if only crane operators can perform crane inspections.

Final Response:

The pre-lift inspections are performed by either site or vendor personnel that are trained to perform crane inspections. Site personnel would be trained at the Muskegon Skill Center and vendor would be trained by their prospective companies. To ensure vendors are qualified, we follow Admin Procedure 11.03, "Training and Qualification for Nonpermanent Plant Employees and Contracted Services Personnel" 6/21/05

UPDATE:

The pre-lift inspections are performed by either site or vendor personnel that are trained to perform crane inspections. Site personnel would be trained at the Muskegon Skill Center and prospective companies would train their employees. To ensure vendors are qualified, we follow Administrative Procedure 11.03, "Training and Qualification for Nonpermanent Plant Employees and Contracted Services Personnel." 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

Palisades lists the following crane issues under operating experience for this AMP:

- a. Containment crane rail attachment bolt grout pads cracked
- b. Load limit of containment crane exceeded during head lift
- c. Containment crane bridge rail splice weld cracks

Provide the documentation for these issues where they were evaluated and resolved.

Final Response:

C-PAL-00-1657, C-PAL-99-2091, C-PAL-96-1557 6/21/05

UPDATE:

- a. C-PAL-00-1657
- b. C-PAL-99-2091
- c. C-PAL-96-1557 6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Basis document for RVI program.

Final Response: 4629/1196 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Topical report or calculation to support the position that the maximum tensile loading of bolting during ASME Code Level A, B, C, and D conditions is compressive or <5 ksi tensile.

Final Response: H060/2130 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Condition report on core barrel degradation.

Final Response: Core barrel degradation was found early in plant life. The hold down force on the internals was significantly increased and no further problems have been identified
6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Condition report on CRDM seal housing degradation.

Final Response: CAP 006864 is in the OE database. OE Record ID 167. 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide operational leakage limits per plant technical specification. Clarify whether these are consistent with NUREG-1432 standards. If not, explain the differences.

Final Response: LCO 3.4.13 PCS operational leakage. 6/21/05 Update: Provided a copy of our operational leakage described in section 3.4.13 of the tech specs. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide acceptance criteria for repair and plugging the flawed tubes.

Final Response: EM-09-05 Tables 6.1, 6.2, 6.3, 6.2.4 NEI 97-06 6/21/05 Update: This also includes Tech Spec Section 5.5.8. Copies of this information was reviewed and provided during the interview. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide changes to PNP Tech spec for SGTI, if any.

Final Response: No recent changes. Planning on taking surveillance out of tech specs. 6/21/05 Update: Answer the same. No recent changes have taken place. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide, tube inspection scope and frequency, plugging or repair, and leakage monitoring Tech specs.

Final Response: Tech Spec 5.5.8 but we implement more conservative criteria than tech specs. See EM-09-05. Tube repair limits section 6.2.3. 6/21/05 Update: Answer the same. No recent changes have taken place. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide implementing procedures and inspection reports regarding foreign materials

Final Response: EM-09-08 section 6.2.6.. Implementing procedures listed in attachment #2. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: LRA states that the steam generator tubes are tested using the eddy current volumetric test method. The examinations for the accessible areas of the secondary side internal components are performed visually. Explain how other area degradation will be detected.

Final Response: Secondary side inspections page is attached. 6/21/05 Update: The program owner described the secondary side inspections that are planned for this next refueling outage. We'll take the information out of the bid spec we sent to a vendor in this space to provide a little more detail as to what we will inspect 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: What are the Tech Spec repair criteria? Provide examples of when flaws were detected and repaired.

Final Response: Tech Spec 5.5.8 6/21/05 Update: A report of one recent past refueling outage results was provided for review. This report was of the same information that is provided via letter to the NRC shortly after our inspections are completed 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide examples of the NDE results

Final Response: I have the field service report that is volumes 4 and 5. 6/21/05

UPDATE:

Auditor chose not to review. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide examples of trending results of inspections are documented (evaluation, and comparison with previous inspection results).

Question B2.1.18-009 NRC Follow-up
Response is acceptable

Final Response:

The best source for information regarding the Palisades Steam generators is found in the following more recent correspondence with the NRC. The 2003 steam generator inspection results were discussed in letters to the NRC dated April 22, 2003 (ML031190626), April 13, (ML041100667), June 28, (ML04890415), and December 1, 2004 (ML043430446). Also NMC Response for Palisades to Generic Letter 2004-01, "Requirements for Steam Generator Tube Inspections", dated October 24, 2004 contains good information on the history and design of the steam generators.

The Generic Letter response provided a Safety Assessment that provided a good summary and trend for the replacement steam generators and results found to date. During the 2004 refueling outage inspection all tubes in both steam generators were inspected. Since we have data on all tubes and tubes with degradation are inspected each outage, trending is a natural aspect of the steam generator inspection program.

Good chemistry control and 100% tube inspection are some of the ways that the existing steam generators are managed to maximize their life. We have full confidence that the existing steam generators can be effectively managed to provide full power through the end of the extended period of operation. 6/30/05

WLR 7-6-05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarify if the above degradation has been discovered with the replaced SGs. If not, explain the reason why these degradation did not/will not happen with the replaced SGs.

Question B2.1.18-010 NRC Follow-up
Response is acceptable

Final Response:

Update: We have experienced all of the traditional Alloy 600 degradation mechanisms in our replaced steam generators, which have ALLOY 600 tubes. Our replacement steam generators were built a number of years prior to their replacement in 1990. That is why they have the Alloy 600 tubes. Some advantages in design were achieved with the replacement steam generators, but not with the tube material. 6/22/05 2100
The best source for information regarding the palisades steam generators is found in the following more recent correspondence with the NRC. The 2003 steam generator inspection results were discussed in letters to the NRC dated April 22, 2003 (ML031190626), April 13, (ML041100667), June 28, (ML04890415), and December 1, 2004 (ML043430446). Also NMC Response for Palisades to Generic Letter 2004-01, "Requirements for Steam Generator Tube Inspections", dated October 24, 2004 contains good information on the history and design of the steam generators.

The generic letter response provided a good summary of active and expected degradation in our replacement steam generators.

The steam generators at Palisades are Combustion Engineering model 2530. The replacement steam generators were installed in the fall of 1990. The tube material is mill annealed ALLOY600 with a 0.75-inch outside diameter and a 0.042-inch wall thickness. Each steam generator has 8219 tubes. The tubes were expanded through the full depth of the tube sheet using an explosive process. The tube bundle is supported by stainless steel egg crate lattice type supports comprised of horizontal egg crate supports, vertical straps and diagonal straps. Tube rows 1-18 are u-bends and rows 19-165 are square bends.

Prior to the installation of the SGs, CE advised Consumers Energy that the area around the center stay cylinder region was potentially susceptible to fretting wear at the bat wing locations. As a result, 308 tubes in steam generator "A" and 309 tubes in steam generator "B" were plugged as a preventative measure. After initial service, steam generator A was designated "Steam Generator E-50A" and steam generator B was designated "Steam Generator E-50B".

After nine cycles of operation, 72 additional tubes in steam generator E-50A have been plugged for a total of 380 tubes plugged. After nine cycles of operation, 54 additional tubes in steam generator E-50B have been plugged, for a total of 363 tubes plugged. Steam Generator E-50A has 7839 active tubes with 4.62% of the tubes plugged. Steam Generator E-50B has 7856 active tubes with 4.42% of the tubes plugged.

The Generic Letter response identified active degradation mechanisms as (1) structural wear in SG E-50 B, and Axial ODSCC in SG E-50A&B. Potential degradation mechanisms have been identified as Axial PWSCC, Circumferential ODSCC, Circumferential PWSCC, Axial PWSCC, tube wear, Pitting and Oblique PWSCC.
6/30/05

WLR 7-6-05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide details of the SG degradation that were discovered at Palisades.

Final Response: Discussion 6/21/05 Update: Details were provided during the discussion. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide details on feedwater ring configuration. Explain how do you inspect feedwater ring and sparger.

Final Response: This is being addressed under RAI 2.3.4-1 issued by NRC 6/3/05 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: If PNP have seen any loose parts during inspections and how do you do FOSAR (foreign material search and retrieval)

Final Response: Examples of loose parts that have been identified during secondary side inspections include, nails, screws, wire, and bolts. Parts are retrieved tube sheet flushed and sludge lancing completed each outage. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide methods and frequencies of SG tubes inspection. How do you inspect tube welds? What are the configuration and material of the tube support and divider plate?

Final Response: For Palisades steam generators, for active degradation and potential degradation mechanisms, the inspection scope, authorized probe and qualified eddy current technique have been providing din response to GL 2004-01. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarify what materials are being use for the replacement SG tubes, tube support, divider...?

Final Response: The tubes are Alloy 600, the tube supports are 409 stainless steel; the divider plates are 410 stainless steel; and the tube sheet is clad with ¼ inch of inconel. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: What program is used for managing aging effects of bolts on SG manway.

Final Response: These inspections are included as part of the bolting program but would be covered under RT-71A-1 as found (VT-2), RT-71A conclusion (VT-2) and primary coolant system class 1 system leakage test. 6/22/05 2100

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarify whether PNP inspects welds between transition transition piece (upper shell and annular part)..

Final Response: These welds have been inspected recently on one of the steam generators as part of our ISI program. 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide more details on the material and inspection of the dryer and secondary side. (Note: PB evaluated AMP for secondary side as a plant specific program.)

Final Response: This is a repeat of an earlier question where we described the scope of next refueling outages secondary side inspection. (#6) 6/22/05 2100

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question
One enhancement is planned to bring the Structures Monitoring Program into conformance with the GALL program description. How is this enhancement tracked to make sure the enhancement will be incorporated into the program?

Final Response: Per page B-138 of the LRA, the subject enhancement to bring the SMP into conformance with NUREG-1801 program requirements is to incorporate into the SMP all structural members listed in Tables 3.4.2-1 thru 10 that credit the SMP. This enhancement is captured as commitment #35 of Enclosure 2 of the LRA transmittal letter of 3/22/05. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question
What specific structures/buildings are under the scope of this AMP for License Renewal?

Final Response: Consistent with commitment 35 in Enclosure 2 of the LRA cover letter, all structures listed in Tables 3.5.2-1 through 3.5.2-10 that contain structural members that use the SMP are in scope of this AMP . This includes the following structures:

- Auxiliary Building
- Containment
- Containment Internals
- Discharge Structures
- Feedwater Purity Building
- Intake Structure
- Turbine Building
- Switchyard and Yard

6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question
Provided a masonry wall inspection report for an unreinforced masonry wall.

Final Response: Unreinforced masonry block walls are not inspected any differently than reinforced block walls. The 1996 and 1999 Structural Monitoring Program inspection reports have been provided to the reviewer. Also, see response to question B2.1.19-005.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification Question

- 1) How often are masonry walls inspected for cracking?
- 2) What are the qualifications of the inspection personnel?
- 3) Do the inspectors use crack maps during the inspections to help in the detection of changes?
- 4) Are crack changes by procedure turned over to engineering for evaluation and documentation in accordance with NRC IEB 80-11?
- 5) What engineering procedures are used to control and evaluate the attachment of new components to block walls evaluated under NRC IEB 80-11?
- 6) Is there a block wall log book to track new attachments to block walls and evaluate the effects on the evaluations performed under 80-11?

Final Response:

- 1) Masonry walls are inspected under the SMP along with other SMP in-scope Structures. Inspections are conducted on a 10-year inspection interval, with 1/3 of the accessible areas inspected every 3-1/3 year period.
- 2) Per the current Palisades Maintenance Rule Structural Monitoring Program (SMP), EM-25-01, inspections are performed by degreed Structural Engineers with 5 years of relevant experience.
- 3) Any previous inspection information is used by the inspectors when performing SMP inspections, including crack map information for block walls where it exists. Procedure EM-25-01 section 7.1.4 identifies mapping as one method (in addition to photos, notes etc) to identify and evaluate findings.
- 4) Engineers are the inspectors so there is no information to be turned over. Any areas for concern with the condition of block walls is documented in accordance with EM-25-01. The source document used as input to EM-25-01 is NEI 96-03, "Guidelines for Monitoring the Condition of Structures at Nuclear Power Plants." The SMP (EM-25-01) does not currently compare block wall inspection results to IEB 80-11 analysis results. The program was developed with the 1996 inspection being the baseline inspection for future comparison. It is recognized that for block walls that are found cracked as part of the SMP it would be appropriate to review 80-11 analysis to determine whether the wall was previously evaluated as a cracked wall, or some level of reanalysis is in order. This will also better support the position of the SMP being consistent with GALL. The License Renewal Structural Monitoring Program will be corrected to indicate that this is an enhancement necessary to be consistent with the GALL. Note that in the original evaluations for block walls under 80-11, the initial evaluation of the wall assumed a cracked section. Only if the wall failed this initial condition was a more detailed evaluation performed.
- 5) In general, attachment of new loads to block walls is highly discouraged. Safety-related block walls are all identified within the facility with a note to contact engineering for evaluation in accordance with Specification C-265, prior to making any new attachments to these walls. Plant Administrative Procedures including the Modification Process ensure all plant changes are reviewed by a Seismic Capability Engineer during the project development process for impact on the Block wall analysis.
- 6) See responses to questions 4 and 5 above. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Clarification Question (received 7/20/05):

Palisades makes the following statement under element DETECTION OF AGING EFFECTS for masonry walls: Periodicity of examinations may vary, according to different reinforcement masonry configurations. Explain what is meant by this statement.

Question B2.1.19-005 NRC Follow-up 7-19-05

The response itself is acceptable. However, an LRA supplement is needed to actually add to the Structural Monitoring Program that the inspection of unreinforced block walls will be on a more frequent basis than reinforced walls. This will result in the PNP AMP agreeing with the GALL AMP for block walls.

Final Response:

A clarification to LRA section B2.1.19 "Structural Monitoring Program" is being provided to better demonstrate consistency with GALL Program XLS5 "Masonry Wall Program" element #4. Specifically, the statement on page B-142 of the LRA that states "Periodicity of examinations may vary, according to different reinforcement masonry configurations." is hereby clarified to say, "In addition, inspections for unreinforced block walls that are not contained by bracing will be performed on a more frequent basis than the periodicity of at least once every 10 year interval specified for reinforced or braced block walls."

LRA Section A2.19 Structural Monitoring Program, page A-8, the following new sentence is hereby added to the end of the second paragraph:

"In addition, the program specifies that inspections for unreinforced block walls that are not contained by bracing will be performed on a more frequent basis than the normal frequency of once each 10 year interval specified for reinforced or braced block walls."

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Clarification Question (received 7/20/05):

Will Palisades take advantage of inspection opportunities for structures required for license renewal and identified as inaccessible? As inaccessible areas become accessible by such means as excavation or other reason, will additional inspections of those areas be performed?

Question B2.1.19-006 NRC Follow-up 7-19-05

The response itself is acceptable. However, an LRA supplement is needed to actually add to the Structural Monitoring Program that inspection of inaccessible areas will be performed when they become accessible due to excavation from normal PNP activities

Final Response:

Due to the lack of aggressive groundwater at Palisades, a plant specific program is not required to age manage inaccessible below grade concrete as discussed in ISG-3. However, to validate this determination NMC will perform an inspection of opportunity on inaccessible concrete when excavation work uncovers a significant depth (i.e., several feet or more) of normally inaccessible concrete.

Accordingly, the following sentence is hereby added to LRA Section B2.1.19, Structural Monitoring Program, after the first paragraph of the "Detection of Aging Effects" section on page B-141:

"In addition, the program provides for inspections of opportunity of normally inaccessible below grade concrete when excavation work uncovers a significant depth (i.e., several feet or more) to provide access for inspection.

In addition, the following sentence is hereby added to LRA Section A2.19, Structural Monitoring Program, page A-8, following the second sentence of the first paragraph:

"In addition, the program provides for inspections of opportunity of normally inaccessible below grade concrete when excavation work uncovers a significant depth (i.e., several feet or more) to provide access for inspection.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarification question

Provide verification that Palisades uses ACI 349.3R-96 as a basis for developing acceptance criteria for concrete structural elements below the waterline.

Final Response:

Enhancement 7.2.4 of LR-AMPBD-25-STRUCMON documents the intent to write a procedure to include underwater structural inspection criteria in accordance with ACI 349.3R. Additionally, enhancement 7.1.1 documents the requirement to include it as a guidance document in the current Maintenance Rule SMP procedure EM-25-01. 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Documentation Question

Palisades lists the following structure issues under operating experience for this AMP.

- ☐ Watertight barrier degradation
- ☐ Spalled concrete and exposed anchor bolts
- ☐ Cracking of concrete beams in the Auxiliary Building
- ☐ Corrosion of condenser rock anchors caused by standing water and debris
- ☐ Deterioration of floor plugs due to leaking water
- ☐ Groundwater leaks in Auxiliary Feedwater Pump Room floor

Provide the documentation for these issues where they were evaluated and resolved.

Followup to B2.1.19-008:

Follow-up questions associated with OE on ground water leakage in the AFW room (CAP045406) requiring further information on the status of the leakage and how our process is ensuring it is monitored for any further degradation. Specifically:

- 1) Is there any spalling or other degradation of the concrete?
- 2) Is the staining of the concrete constant or is it expanding?
- 3) Is the water influx considered seepage or leakage (i.e., relative magnitude)
- 4) Is there any sand intrusion?
- 5) How does Palisades' process ensure more frequent inspections are performed to monitor for worsening degradation? 6/30/05

Question B2.1.19-008 NRC Follow-up 7-19-05

The response is NOT acceptable. The response mentions how the structural monitoring program at PNP requires more frequent inspections of areas showing signs of aging, such as the wall cracks. However, the response does not identify the frequency of future inspections of the cracked wall under the structural monitoring program. Is it the intent of the applicant to identify the frequency in its response? Instead, the response gives the flood barrier inspection frequency for the room where the wall cracks exist. Is it the intent of the applicant to docket this frequency under oath and affirmation?

Final Response:

The following CAPs address the issues described. The SMP PBD OE section has the issue, but not the evaluations or resolutions:

- CAP000548 or CAP033824 (originally C-PAL-95-0018)
- CAP005033 (originally C-PAL-96-1241)
- CAP011305 (originally C-PAL-95-0168)
- CAP012130 (originally C-PAL-00-1179)
- CAP022060 (originally C-PAL-96-0543)
- CAP045406

Hardcopies of the evaluations and final resolutions of these CAPs were provided to the NRC reviewer for review.

Followup responses wrt to groundwater leak in AFW room OE (CAP045406) are provided below:

- 1) There has been no spalling noted in these areas or other obvious signs of degradation in the joints in the walls.

Summary Report of License Renewal Review Questions for: AMP Audit

- 2) The area of staining is relatively constant. The wall have been cleaned and painted in the past, but as water continues to seep into the room, the staining returns to approximately the previous extent.
- 3) Based on the quantity of water that enters through this pathway, it should be considered seepage. The rate is insignificant enough that it is considered only as a housekeeping issue.
- 4) To our knowledge, there has never been sand intrusion through this joint, and certainly not since repairs were attempted last in the mid 1990s.
- 5) Palisades Structure Monitoring Program EM-25-01 Section 7.1.6b requires increased frequency of inspection where deemed prudent, which includes conditions where concrete elements have active cracks or other damage. However, in reviewing the initial SMP evaluation (1996) and followup baseline inspection results for the AFW room (1999), it was determined that there were no findings noted. This is likely due to the long term nature and past evaluations of the acceptability of the condition. Action Request CAP048474 has been initiated to identify that the SMP did not note the adverse condition of the AFW wall for continued monitoring. A copy of CAP048474 was provided to the NRC reviewer. It is worth noting that this room is inspected yearly as a part of the flood barrier inspection requirements of procedure MSM-M-16. 6/30/05

Response to 7/19/05 NRC Follow-up Questions:

1. Question: Is it the intent of the applicant to identify the frequency in its response?

Response: Yes. See proposed response below.

2. Question: Is it the intent of the applicant to docket this frequency (ie, annual flood barrier frequency) under oath and affirmation?

Response: No. It is not our intent to discuss the frequency of the flood barrier inspections under oath and affirmation. Instead, we will document the Structural Monitoring Program requirements for inspection frequencies when degradation findings are identified. See proposed response below.

Listed below are the draft docketed responses to the questions posed. It is assumed that the only responses required to be placed on the docket are the five follow-up questions related to the subject of AFW Room ground water in-leakage.

1. See previous response.

2. See previous response.

3. See previous response.

4. See previous response.

5. Palisades Structure Monitoring Program (SMP) EM-25-01 Section 7.1.7 requires increased frequency of inspection for structural conditions found to be structurally acceptable but with deficiencies, or found to be unacceptable.

"Acceptable with Deficiencies" is an inspection grading category whereby the structure or structural element is capable of performing their structural functions but are degraded, or have deficiencies which could deteriorate to an unacceptable condition, or should be corrected prior to the next normally scheduled ten-year inspection interval. If the structure or structural element is not repaired before the next one-third (1/3) inspection interval, it requires augmented inspection during the next inspection period. Repaired structures receive augmented inspections during the next inspection period to validate that the repairs have been effective over time. Unacceptable conditions are corrected in a timely manner commensurate with their safety significance, their complexity, and other regulatory requirements. Additional degradation-specific condition monitoring and increased frequency of inspections are required until the corrective actions are complete and it is assured the structure can fulfill its intended functions and will not degrade to the point that it cannot fulfill its design basis.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Provide a comparison between the monitored parameters for EPRI Revision 3 and Revision 5. Explain why EPRI is acceptable (verification that non of the controlled parameters are relaxed in the later revisions). This may be needed to be considered as an exception.

Final Response: See response to question 9 [NMC Tracking No. 80] for a commitment to prepare and submit a comparison of the identified EPRI standards, justify differences, and revise the Water Chemistry Program description if necessary..

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: GALL XLM2 states that in certain cases verification of the effectiveness of the chemistry control program is undertaken to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. An acceptable verification program is a one-time inspection of selected components at susceptible locations in the system.
LRA B2.1.21 states that The One-Time Inspection Program verifies that the Water Chemistry Program is managing the effects of aging of selected components in low flow or stagnant areas.
However, LRA has not provided any clarification that the low flow and stagnant locations are the only susceptible locations that require inspection by OTI program. Provide clarifications.

Final Response: While the most susceptible locations may be the low flow or stagnant portions of a particular system, it was not intended to limit the selection of susceptible locations to low flow or stagnant portions of a system. Upon implementation of the One-Time Inspection Program, NMC plans to group all identified components within the system with the same material, same environment, and same aging mechanism. From this group, the most susceptible locations will be selected for inspection. When determining the most susceptible locations, all portions of the system(s) will be considered, not just the low flow or stagnant sections. Therefore, the following changes are made to the Water Chemistry and One-Time Inspection Program descriptions in Appendix B of the LRA:

On page B-97, under Program Description, revise the first bullet of the third paragraph to read, "To verify the effectiveness of water chemistry control for managing the effects of aging in portions of piping exposed to a treated water environment."

On page B-103, under Detection of Aging Affects Related to XLM32, One Time Inspection, revise the second paragraph in its entirety to read, "To verify that the Water Chemistry Program and the Closed Cycle Cooling Water Program are mitigating the applicable aging effects, visual examinations or other appropriate NDE methodology will be used when components are inspected."

On page B-156 , under Detection of Aging Affects, revise the last sentence of the first paragraph to read, "In addition, inspections of selected components at susceptible locations of a system, performed under the One-Time Inspection Program, provide verification of the effectiveness of the Water Chemistry Program."

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Provide implementing procedures or/and other document a) to show the limits for controlled contaminations (chlorides, sulfates, fluorides and dissolved oxygen, including hydrogen peroxide, pH and conductivity) for both primary and secondary systems, b) Identify locations of where samples are taken, c) frequencies of sampling and analysis, d) an example of actual parameters takes, e) provide details of instances that the measured controlled parameters exceeded the EPRI limits. f) describe the corrective actions taken.

Final Response: Chemistry 6/21/05

- a) COP-1 has been provided
- b) Samples are obtained per COP-1, Attachment 20 in Sample Panels located in the Aux. Building.
- c) Sample frequency and analysis are listed in COP-1, Attachment 1-8.
- d) Attached- Secondary data as identified by Jay Slakes is highlighted from 6/22/05, "Palisades Nuclear Station Daily Chemistry Status Report;" Total Copper and Iron are listed on a "WinCDMS32 Completed Tasks Report."

Primary data as identified in the question has been highlighted in June 22, 2005, "Palisades Nuclear Station Daily Chemistry Status Report," and "WinCDMS 32 Completed Task Report." Hydrogen Peroxide is used and measured during Shutdown; this data from 2001 is included in report, "winCDMS32 Completed Tasks Report," please see the note in our response to B2.1.9-006.

- e) Primary System chemistry has not exceeded any action level limits within the last 5 years. See Attached Graphs.

F) N/A

Secondary Response

- a. Procedure to implement and control secondary contaminants and additives is COP-11. This has been provided already. Samples obtained per COP-11 are taken primarily in the cold chemistry laboratory at the C-42 panel. Some samples may be obtained locally, but most are able to be run directly into the laboratory. Feedwater iron and copper transport samples are obtained at the M-97 corrosion product monitor panel on the 590' elevation of the turbine building, east side, towards the north end of the main condenser. Please let me know if more exact information is desired.
- c. Frequencies of sampling and analyses are provided in COP-11 attachments 1 - 6.
- d. Carrie Jones is providing an example of actual parameters obtained. I requested this via email on June 21, 2005.
- e&f. Instances where the controlled parameters exceed EPRI limits:
 - 1. For the past five years, steam generator sodium has not exceeded Action Level 1 values for > ~30% power operation.
 - 2. For the past five years, steam generator chlorides have not exceeded the Action Level 1 values for > ~30% power operation except in brief instances when power escalation above ~30% was authorized while exceeding Action Level 1 values for steady state operation. Condition reports were not generated for these instances since it was authorized per the procedure and the chlorides decreased as expected.
 - 3. For the past five years, steam generator sulfates have not exceeded the Action Level 1 values for > ~30% power operation except in brief instances when power escalation above ~30% was authorized while exceeding Action Level 1 values for steady state operation. Condition reports were not generated for these instances since it was authorized per the procedure and the sulfates decreased as expected.
 - 4. Cation Conductivity has not entered an action level during normal steady state operation greater than 30% for the last five years.
 - 5. Feedwater Iron has exceeded the Action Level one value of 5 ppb 24 times and Copper has exceeded the Action Level 1 value of 1 ppb one time in the past five years. Recent examples of action taken have been provided with the following condition reports:
CAP47587 4/21/05 – B FW > Action Level 1
CAP46265 1/21/05 – B FW > Action Level 1
CAP45687 Evaluation of elevated Iron's affect on CPI.

Summary Report of License Renewal Review Questions for: AMP Audit

CAP45444 11/29/04 – A FW > Action Level 1 after Rx S/U
CAP38733 11/21/03 – B FW > Action Level 1
CAP38421 11/4/03 – Benchmarking Summary of CPM Practices
CAP38177 10/22/03 – Second look at elevated iron on 10/3/04
CAP37933 10/3/03 – B FW > Action Level 1
CAP37694 9/22/03 – B FW expected to be > Action Level 1
CAP32364 12/5/02 – B FW > Action Level 1
CAP31508 10/2/02 – B FW > Action Level 1

Additionally, see the attached file of corrosion product monitor history of feedwater iron and copper values to date.

6. Feedwater DO2 has not exceeded Action Level values in the past five years while at power operation.

7. Feedwater hydrazine has not exceed Action Level values in the past five years while at power operation.

8. Condensate Dissolved Oxygen has exceeded Action Level 1 value of 10 ppb several times in the past five years. Examples of action taken are provided in the referenced condition reports:

CAP45510 12/1/04 – Evidence of low threshold for DO2 variations CAP43483 9/12/04 – Action Level 1 CPD DO2 due to pump repairs

CAP43443 9/10/04 – Action Level 1 CPD DO2 – Pump maint.

CAP43065 8/18/04 – Major source of CPD DO2 Summarized

CAP42939 8/12/04 – Ops Identifies suction flange leak on Cond. Pump as source of CPD DO2 for last month.

CAP43483 9/12/04 – Action Level 1 CPD DO2 due to pump repairs

CAP43443 9/10/04 – Action Level 1 CPD DO2 – Pump maint.

CAP43065 8/18/04 – Major source of CPD DO2 Summarized

CAP42939 8/12/04 – Ops Identifies suction flange leak on Cond. Pump as source of CPD DO2 for last month.

CAP42633 7/22/04 – CPD DO2 enters Action Level 1 during derate

CAP42475 7/12/04 – CPD DO2 enters Action Level 1 during MFP restoration.

CAP42393 7/7/04 – CPD DO2 enters Action Level 1 when seal steam secured to B MFP.

CAP40145 2/23/04 – CPD DO2 elevated during feed transients.

CAP35824 5/21/03 – CPD DO2 entered Action Level 1 when a drain trap was restored to service.

6/22/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: LRA B2.1.21, scope of program states that the WCP manages SSCs for Alloy 600. Identify components that are made of Alloy 600. Explain how effectiveness of WCP is verified for these components.

Final Response: LR-AMPD-01-ALLOY600 identifies all components constructed of Alloy 600 material. As identified in NUREG-1801, IV.A2.2-a (This is one of many line items in NUREG-1801) both the Water Chemistry Program and the Alloy 600 Program are used to manage cracking of alloy 600 components. The alloy 600 program is an inspection of the alloy 600 components, thus, a verification of the Water Chemistry Program. 6/21/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain how fouling and heat loss transfer intended functions/aging effects are managed by the WCP.

Final Response: Chemistry parameters are controlled within specified limits which have proven successful in preventing or mitigating fouling of heat transfer surface areas.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain the methods for hydrogen peroxide sampling and analysis and its limits. Provide sampling locations, frequencies, limits, examples of measured/analyzed data, instances of being above the limits for the last five years, corrective actions taken.

Final Response:

Chemistry

Cop-1 6/21/05

Tabular data was provided in B2.1.21-003d. Graphical data (4-pages) has also been attached. 6/22/05

This information added later and not necessarily discussed with the auditor. WLR 7-6-05

The Water Chemistry Program Basis Document does contain the following:

The NUREG-1801, section XLM2.3 states, "The concentration of corrosive impurities listed in the EPRI guidelines discussed above, which include ... hydrogen peroxide, are monitored to mitigate degradation of structural material." The addition of hydrogen peroxide to the Primary Coolant System (PCS) is an industry-accepted practice to reduce the source term, and provide for chemical degassing, and is recommended in the EPRI PWR Primary Water Chemistry Guideline, volume 2. Additions and monitoring of hydrogen peroxide in the PCS is controlled by Chemistry Operating Procedure COP-1 (Ref. 8.13), and is consistent with the NUREG-1801 requirement to monitor the PCS concentration of this chemical.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: LRA B2.1.21, "detection of aging effects" states that in selected areas WCP monitors for iron and copper presence, which could indicate loss of material in some components. Identify the frequency of sampling, the sampling location, and acceptance criteria or limits. Additionally, provide an example of sample results and instances where results were greater than the acceptance or limits for a 5 year history.

Final Response: Chemistry.Cop-11 6/21/05

This information added after the Audit and not necessarily discussed with the auditor. WLR 7-6-05

The Water Chemistry Program mitigates aging effects such as loss of material due to general, pitting, and crevice corrosion, cracking due to SCC, steam generator tube degradation caused by denting, intergranular attack (IGA) and outer diameter stress corrosion cracking (ODSCC) by controlling the chemical species that cause the underlying aging mechanisms that result in the aging effects. The chemistry parameters measured are defined and listed in the Primary and Secondary Water Chemistry Monitoring Programs for all modes of operation. The Water Chemistry Program does not detect aging effects directly; however in selected areas it does monitor for iron and copper presence, which could indicate loss of material in some components. In addition, inspections of selected components at susceptible locations in low-flow or stagnant portions of a system performed under the One-Time Inspection Program provide verification of the effectiveness of the Water Chemistry Program WLR 7-6-05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: LRA B2.1.21, "acceptance criteria" states that some of the parameters monitored are used for diagnostic purposes only and do not have acceptance criteria recommended by the EPRI guidelines. Identify those diagnostic parameters that have acceptance criteria different from the recommended EPRI guideline. Explain why they are different at Palisades.

Final Response: LR-AMPBD-26-CHEMISTRY states: The acceptance criteria for the chemistry parameters required to be monitored and controlled are based on the EPRI guidelines, Palisades Technical Specifications and the Operating Requirements Manual. Some of the parameters monitored are used for diagnostic purposes only and do not have acceptance criteria recommended by the EPRI guidelines. Water chemistry acceptance criteria are listed in plant procedures. 6/21/05

This question is answered by the previous data provided with respect to feedwater iron and copper transport. While closed cooling water systems (DG Jacket Water, Component Cooling Water, and Shield Cooling System) are monitored for iron and copper, there are no "limits" associated with these parameters, and as such, they cannot be exceeded. Graphs are provided of CCW and DG Jacket Water for review of the last five years. 6/22/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Express if any of the industry operating experience associated with the WCP may be applicable to Palisades. That is similar situations exists at Palisades, but it is managed by its WCP.

Final Response: There are 101 industry operating experiences in the OE data base that were reviewed for their applicability to the Palisades Water Chemistry Program. 6/21/05

UPDATE:
OE discussion during interview - Industry and Plant specific. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain how MIC in the main condenser is related to WCP. Also how it is managed (prevented, detected, and trended).

Final Response: Chemistry 6/21/05

UPDATE:

A discussion of how CWS is chlorinated in interview. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Explain whether the NRC order related to the reactor head inspection has any impact on the WCP at Palisades.

Final Response: Chemistry 6/21/05

UPDATE:

No impact discussed during interview. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Section 4.3 lists the systems that uses WCP to mange their components aging effects. Provide the LRA system name and section for these palisades systems.

Final Response: This information provided. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide Attachment 9.2 to the WCP basis document.

Final Response: PBD's were updated to provide this information. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide Palisades responses to the NRC's generic letters, bulletins, and information notices for to the systems that their aging effects are managed by the WCP.

Final Response: The package of two Generic Letters and one Bulletin was provided. 6/23/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Clarify how addition of hydrogen peroxide is consistent with GALL and EPRI guidelines.

Final Response: Information provided during discussion.

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Please provide a copy of the Palisades chemistry self assessment program.

Final Response: Chemistry Self-Assessment provided during discussion. 6/23/05

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Basis document for fatigue monitoring program.

Final Response: LR-AMPBD-12 FATIGUE 6/21/05

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: NMC responded to RAI-B2.1.5-1 (Buried Services Corrosion Monitoring Program) in a letter dated July 1, 2005. In this response NMC stated that it would perform inspections within ten years after entering the period of extended operation. This commitment is not consistent with the level of inspection that the NRC staff has determined is appropriate for managing this aging effect.

The NRC staff has determined that inspections performed to confirm that coating and wrapping are intact for steel components are an effective method to ensure that corrosion of external surfaces has not occurred and the intended function is maintained. For stainless steel components, visual inspections of the external surfaces visual inspection is sufficient to assure that the intended function is maintained. Prior to entering the period of extended operation, the applicant is to verify that there is at least one opportunistic or focused inspection is performed within the past ten years. Upon entering the period of extended operation, the applicant is to perform a focused inspection within ten years, unless an opportunistic inspection occurred within this ten-year period. Any credited inspection should be performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems.

Please confirm if at Palisades NMC will perform the recommended inspections discussed above or provide a basis for the inspections that will be performed for the buried components.

Final Response: In response to this revised NRC position, incorporated in the September 2005 draft of NUREG 1801 Revision 1 (released in August 2005), NMC hereby withdraws the subject commitment provided in the letter of July 1, 2005. A new Preliminary Commitment (i.e., subject to acceptance in the NRC SER for the renewed operating license), is provided, to read as follows:

Visual inspections of a sample of buried carbon, low-alloy, and stainless steel components will be performed within ten years prior to entering, and within ten years after entering, the period of extended operation. Prior to the tenth year of each period, NMC will perform an evaluation of available data to determine if sufficient opportunistic inspections have been performed within that period to assess the condition of the components. If insufficient data exists, focused inspection(s) will be performed as needed.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☐ **Potential Docketed Response**

Status: Closed - Accepted by Auditor

Information Request: Enclosure 2 to the transmittal letter for the LPNP LRA is a table of preliminary commitments related to license renewal. The project team notes that the applicant commits to take certain actions and in some cases specifies the point in time by which they will be completed. For AMPs that will require review and approval by the staff prior to the period of extended operation, other project team questions specifically request commitment to do so.
The remaining commitments are to be completed prior to the period of extended operation, but neither the transmittal letter nor the enclosure includes an explicit commitment to meet this deadline. Please make the commitment explicit. (This may affect enclosure table items 9, 10, 12, 13, 14, 15, 16, 17,18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 30, 35,36, and 37

Final Response: It is our commitment to have all AMPs in place before entering the period of extended operation, and we assume that the final commitments as accepted by the NRC in Appendix A of the SER will also specify this.

Please refer to our response to RAI-A1.0-1 in NMC letter dated July 1, 2005 (ML051950390).

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Enclosure 2 to the transmittal letter for the LPNP LRA is a table of preliminary commitments related to license renewal. The project team notes that it will be necessary for the staff to review and approve the entire reactor vessel internals program prior to the period of extended operation, and will require adequate time to do so. For changes in dimension due to void swelling, there is already a commitment to report the result of evaluations at least two years prior to the period of extended operation (Item 33 of the table). Please revise the commitment to submit the entire program, addressing any results of other industry initiatives that affect the PNP AMP B2.1.17 (discussed in Item 34 of the table) for review at least 24 months prior to the period of extended operation to allow adequate time for NRC staff review and approval of the entire RV Internals program prior to the period of extended operation.

Final Response: Preliminary Commitments 33 and 34 in Attachment 2 of the Palisades LRA transmittal letter dated March 22, 2005, are hereby combined into a single new commitment 33 to read as follows:
Preliminary Commitment 33 from NMC LRA transmittal letter dated March 22, 2005, is hereby revised to read as follows: NMC will participate in industry initiatives that will generate additional data on aging mechanisms relevant to reactor vessel internals (RVI), including void swelling, and develop appropriate inspection techniques to permit detection and characterization of features of interest. Recommendations for augmented inspections and techniques resulting from this effort will be incorporated into the Reactor Vessel Internals Program as applicable. The revised Reactor Vessel Internals Program will be submitted for NRC review and approval by March 24, 2009.
Preliminary Commitment 34 is hereby withdrawn.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Enclosure 2 to the transmittal letter for the LPNP LRA is a table of preliminary commitments related to license renewal. The project team notes that it will be necessary for the staff to review and approve the Alloy 600 program prior to the period of extended operation, and will require adequate time to do so. Please revise the commitment to submit the re-evaluations (those discussed in item 6 of the table) for review at least 24 months prior to the period of extended operation to allow adequate time for NRC staff review and approval prior to the period of extended operation..

Final Response: This revised response addresses draft NRC RAI 4.7.2-6 (received on August 25, 2005), requesting the revised AMP be submitted three years prior to the period of extended operation, as well an NRC request on August 31, 2005 that the preliminary commitment be reworded.

Accordingly, Preliminary Commitment 6 in Enclosure 2 of the Palisades LRA transmittal letter dated March 22, 2005, is hereby revised to read as follows:

NMC will update the Alloy 600 Program to reflect the latest regulatory requirements and plant commitments at the time of submittal. The revised Alloy 600 Program description will be submitted for NRC review and approval by March 24, 2008.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Followup to Database Item 116

Since the tendon surveillance program has not had a common tendon defined for the life of the plant, and a complete set of surveillance results is not available for trending, is this an exception to GALL? If so, please justify.

Final Response:

The Palisades tendon surveillance program was directed by Plant Technical Specifications until 10 CFR 50.55a invoked testing in accordance with ASME Section XI, Subsection IWL, in 1996. Palisades Technical Specifications did not require the selection of common tendons. As a result, common tendons were not defined at Palisades until the 30-Year tendon surveillance conducted in 2002. The selected tendons did not meet the desired criteria in that they had been detensioned during the first tendon surveillance in the early 1970s. Therefore, LRA Section B2.1.7, Containment Inservice Inspection Program, Exceptions to NUREG 1801, is hereby revised to read, "The generally accepted definition of common tendon does not completely correspond with the XLS2, ASME Section XI Sub-Section IWL portion of the Containment Inservice Inspection Program, and is considered to be an exception to NUREG 1801."

This exception does not degrade the effectiveness of the program to assure an acceptable level of containment structural integrity at all times. The Palisades tendon surveillance program is designed to maintain the tendon force above minimum analysis requirements on a continuous basis from surveillance to surveillance. This is accomplished each surveillance by performing tendon force measurements, comparing the results against expected levels for tendon force, and assuring that any expected relaxation will not reduce tendon forces below minimum requirements beyond at least the next surveillance. Structural integrity does not rely solely on the projection of forces in a designated common tendon out to the end of plant life.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: ISG-4 and the GALL Report XLM26 recommends periodic inspection and test of halon/carbon dioxide fire suppression system. During previous discussions with the NMC Technical staff, the NMC stated that the halon and CO2 systems at Palisades are not in-scope of license renewal. For the project team to complete its review of consistency of PNP B2.1.10 with the GALL AMP, please identify all Palisades halon and CO2 systems at Palisades. In addition, clarify why periodic inspection and test of halon/carbon dioxide fire suppression system, as recommended by GALL XLM26, is not required for Palisades (is different for Palisades).

Final Response: The Palisades Plant has a CARDOX system that is for turbine generator hydrogen space purging, and not for fire protection. There is a halon fire protection system that is designed to mitigate the effects of a fire in the Critical Function Monitoring System (CFMS) trailer, located in the Turbine Building. No NRC license requirements are identified for the halon system. This single halon system does not protect any safety related or safe shutdown equipment.

Therefore, there are no Halon/Carbon Dioxide Fire Protection Systems in scope for license renewal, and no aging management program is required. Palisades uses water spray to protect some areas (e.g., cable spreading room) that are typically protected by either Carbon Dioxide or Halon at most plants.

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: Table 3.3.2-7 lists "valves and dampers" and "piping and fittings" as component groups with soil external environment. Explain how loss of material and selective leaching aging (for buied cast ironpiping) aging effects of these components are managed by the fire protection AMP. In addition, similar to buried services corrosion AMP, provide frequency of inspection of the buried components that are managed by fire protection program.

Final Response: Table 3.3.2-7 for the Fire Protection System, on pages 3-154 through 3-157, indicate that cast iron components in soil and raw water environments are managed for Selective Leaching by the One-Time Inspection Program. The One-Time Inspection Program discussion in LRA Section B2.1.13, page B-100, summarizes the application of the program to selective leaching

The buried "valves and dampers" and "piping and fittings" of the Fire Protection System are managed for Loss of Material by the Fire Protection Program. The Fire Protection Program discussion in LRA Section B2.1.10, page B-77, summarizes the application of the program to below grade fire protection system components.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The FSAR supplement currently does not contain the requirement to perform a system walkdown inspection and a review of maintenance, operating and training practices and procedures. The applicant in response to Question B2.1.14-002 indicated that this is performed. This question is to ensure that the FSAR Supplement is revised to include these two items.

Final Response: LRA Section A2.14, Open Cycle Cooling Water Program, page A-6, third sentence, is hereby revised to read as follows:

The aging effects are managed through (a) monitoring and control of biofouling, (b) flow balancing and flushing, (c) heat exchanger testing (d) routine inspection and maintenance program activities, (d) system walkdowns, and (e) review of maintenance, operating and training practices and procedures, to ensure that aging effects do not impair component intended function.

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: LRA B2.1.21, "acceptance criteria" states that some of the parameters monitored are used for diagnostic purposes only and do not have acceptance criteria recommended by the EPRI guidelines. Identify those diagnostic parameters that have acceptance criteria different from the recommended EPRI guideline. Explain why they are different at Palisades. (Note: this was asked as question B2.1.21-008, However, the response was not docketed.)

Final Response: The acceptance criteria for the chemistry parameters required to be monitored and controlled are based on the EPRI guidelines, Palisades Technical Specifications and the Operating Requirements Manual. Some of the parameters are monitored for diagnostic purposes only. The EPRI guidelines do not contain acceptance criteria for parameters monitored only for diagnostic purposes.

This question arose during discussion of data for feedwater iron and copper transport. At Palisades certain closed cooling water systems (DG Jacket Water, Component Cooling Water, and Shield Cooling System) are monitored for iron and copper, but there are no EPRI-specified "limits" associated with these parameters. This is an acceptable practice, and does not impact chemistry program effectiveness for aging management.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The FSAR supplement does not contain the requirement to perform testing of the new fuel oil prior to introduction into the storage tanks (As required by the Standard Review Plan) Please provide a justification for this omission or include this feature in Appendix A. This response will need to be docketed. Note: the testing is currently being performed by the applicant.

Final Response: LRA Section A2.9, last sentence, is hereby revised to read: Fuel oil quality is maintained by monitoring and controlling fuel oil contamination in accordance with the guidelines of the American society for Testing Materials (ASTM) Standards D 1796, D 2276, D 2709, and D 4057; and by verifying the quality of new oil before its introduction into the storage tanks.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: GALL recommends visual inspection (VT-1 or equivalent) of approximately 10% of each type of penetration seal in walk downs is performed at least once every refueling outage.

Please provide a technical justification as to how the visual inspection method that the applicant will use is equivalent and assures the same level of flaw identification and documentation as would be achieved by VT-1 and VT-3.

Final Response:

The ASME Section XI Code identifies inspection and acceptance criteria to apply to various systems/components (i.e., IWB-3520.1, IWB-3520.2) when using a VT-1 or VT-3 examination. IWA-2211, VT-1 Examination states: "VT-1 examinations are conducted to detect discontinuities and imperfections on the surfaces of components, including such conditions as cracks, wear, corrosion, or erosion." IWA-2213, VT-3 Examination states: "VT-3 examinations are conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearances, settings, and physical displacements; and to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear, or erosion. VT-3 includes examinations for conditions that could affect operability or functional adequacy of snubbers and constant load and spring type supports."

Palisades' fire barrier penetration seal inspection surveillance procedure contains detailed inspection criteria, inspection methods, and acceptance criteria for each of the installed seal types. These requirements are equivalent to the level of detail required for a VT-1 inspection conducted under ASME Section XI. Completed inspection procedures are signed off as acceptable, or any unacceptable condition is documented in the Corrective Action System and repaired or replaced as required. NMC considers this as equivalent to VT-1 or VT-3 examinations as used in ASME Section XI and discussed in GALL.

It is also noted that NUREG 1801, draft revision 1, (as publicly released on August 12, 2005), Section XI.M26, removes reference to VT-1 and VT-3 from Detection of Aging Effects. It instead specifies that visual inspection by fire protection qualified inspectors of the fire barrier walls, ceilings, and floors, performed in walkdowns at least once every refueling outage, ensures timely detection of concrete cracking, spalling, and loss of material. Visual inspection by fire protection qualified inspectors detects any sign of degradation of the fire door such as wear and missing parts.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: NUREG 1801 Section XLM26, Fire Protection, as modified by ISG-04, states under Detection of Aging Effects, "Periodic tests performed at least once every refueling outage, such as flow and discharge tests, sequential starting capability tests, and controller function tests performed on diesel-driven fire pump ensure fuel supply line performance. The performance tests detect degradation of the fuel supply lines before loss of the component intended function." Under Monitoring and Trending it states, "The performance of the fire pump is monitored during the periodic test to detect any degradation in the fuel supply lines. Periodic testing provides data (e.g., pressure) necessary for trending."

In LRA Section B2.1.10, Enhancement 4 states, "Detection of Aging Effects and Monitoring and Trending: Revise diesel-driven fire pump performance test procedures to more specifically address requirement to inspect and monitor fuel oil supply line for aging related degradation and to document inspection results." The enhancement does not indicate whether or not the revised procedures will be consistent with the quoted GALL paragraphs.

Please provide information to demonstrate that the revised procedures will be consistent with the GALL paragraphs quoted above, or, if not, identify any exceptions.

Final Response: LRA Section B2.1.10, Fire Protection Program, Detection of Aging Effects, second full paragraph on page B-77, is hereby revised to read as follows:

Testing of the fire pumps (e.g., diesel-driven fire pump flow and discharge tests, sequential starting capability tests, and controller function tests) is performed every 18 months to ensure that an adequate flow of water is supplied and that there is no degradation of the fuel line to the diesel-driven fire pump.

LRA Section B2.1.10, Fire Protection Program, Monitoring and Trending, third paragraph on page B-78, is hereby revised to read as follows:

Testing of the fire pumps is performed every 18 months to ensure that an adequate supply of water is supplied and that there is no degradation of the fuel line to the diesel driven fire pump. The performance tests detect degradation of the fuel supply lines before loss of the component intended function, and provide data (e.g., pressure) necessary for trending.

These revised statements are consistent with the GALL paragraphs quoted in the question.

Summary Report of License Renewal Review Questions for: AMP Audit

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The PNP Structural Monitoring Program AMP does not discuss the need or lack of need to perform periodic ground water monitoring to ensure that the below -grade water chemistry does not become aggressive in the future. Justify not performing periodic ground water monitoring during the CLB and potential extended license period to check water chemistry for non-aggressiveness. See Question 3.5.1-21W2 Response needs to be docketed

Final Response: As discussed in LRA Section 3.5.2.2.1.1, on pages 3-269 - 3-271, ground water chemistry records are available for the current operating period, and provide the basis that water in contact with Palisades' below-grade concrete is currently non-aggressive, and has been non-aggressive over at least the last 40 years. To ensure ground water remains non-aggressive over the extended operating period, ground water sampling for pH, chlorides, and sulfates will be performed as part of the Structural Monitoring Program with a periodicity not to exceed every 5 years.

Accordingly, the following changes are hereby made to LRA Section B2.1.19:

On page B-137, after the last paragraph of the section entitled "Program Description", the following paragraph is added: "For below grade inaccessible concrete, Interim Staff Guidance #3 (ISG-3) discusses potential aging effects requiring management (AERMs) if the below grade environment is aggressive (pH < 5.5, chlorides > 500 ppm, or sulfates > 1500 ppm). Historical groundwater sampling performed at Palisades shows that the below grade environment is, and has been, non-aggressive by a significant margin. As part of the Structural Monitoring Program, Palisades will continue to monitor groundwater on a periodic basis to ensure it remains non-aggressive such that the associated AERMs remain not applicable."

On page B-140, after the last paragraph of the section entitled "XL56, Structures Monitoring", under "Parameters Monitored, Inspected, and/or Tested", the following paragraph is added: "Local groundwater will be sampled on a periodic basis to ensure pH values and concentrations of chlorides and sulfates remain below levels considered aggressive to concrete."

On page B-142, after the last paragraph of the section entitled "XL56, Structures Monitoring", under "Monitoring and Trending", the following paragraph is added: "Groundwater sampling for pH, chlorides, and sulfates will be performed to ensure the below grade environment remains non-aggressive with a periodicity not to exceed every 5 years."

On page B-143, after the last paragraph of the section entitled "XL56, Structures Monitoring", under "Acceptance Criteria", the following paragraph is added: "Groundwater sampling will verify a non-aggressive below grade environment exists, as described in ISG-3, by ensuring pH > 5.5, chlorides < 500 ppm and sulfates are < 1500 ppm."

In addition to the program changes, conforming changes are made in various locations of LRA Section 3.5.2.2 which currently state that continued groundwater sampling is unnecessary. The new paragraph to be added reads as follows: "As part of the Structural Monitoring Program, Palisades will continue to monitor groundwater on a periodic basis to ensure it remains non-aggressive, such that the associated aging effects remain not applicable." This new paragraph is hereby added to the following LRA locations, to replace the existing paragraphs, as follows:

On page 3-271, replace existing paragraph that begins, "In addition it is concluded that additional groundwater monitoring ..."

On page 3-273, replace existing paragraph that begins, "In addition it is concluded that additional groundwater monitoring ..."

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On page 3-286, replace existing paragraph that begins, "It is also concluded that it is not necessary to monitor groundwater chemistry ..."

On page 3-289, replace existing paragraph that begins, "It is also concluded that it is not necessary to monitor groundwater chemistry ..."

On page 3-297 replace existing paragraph that begins, "It is also concluded that formal groundwater monitoring ..."

On page 3-298, replace existing paragraph that begins "It is also concluded that formal groundwater monitoring ..."

A conforming change is also made to the FSAR description of the Structural Monitoring Program in LRA Section A2.19, by adding the following sentence at the end of the first paragraph, "As part of the Structural Monitoring Program, groundwater sampling for pH, chlorides, and sulfates will be performed, with a periodicity not to exceed every 5 years, to ensure the below grade environment remains non-aggressive."

Source: AMP Audit

☒ **Potential Docketed Response**

Status: Closed - Response Docketed

Information Request: The PNP Structural Monitoring Program AMP does not discuss the need or lack of need to perform periodic ground water monitoring to ensure that the below -grade water chemistry does not become aggressive in the future. Justify not performing periodic ground water monitoring during the CLB and potential extended license period to check water chemistry for non-aggressiveness. See Question 3.5.1-07W2. Response needs to be docketed.

Final Response: This is a duplicate to question 628. See response to question 628.
(See response to NRC Question 1 above. This question is a duplicate.)