December 29, 2009

Mr. Randall K. Edington
Executive Vice President, Nuclear
Mail Station 7602
Arizona Public Service Company
P.O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3, LICENSE RENEWAL APPLICATION (TAC NOS. ME0254, ME0255, AND ME0256)

Dear Mr. Edington:

By letter dated December 11, 2008, as supplemented by letter dated April 14, 2009, Arizona Public Service Company (APS) submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 to renew Operating License Nos. NPF-41, NPF-51, and NPF-74 for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, respectively. The staff completed its Aging Management Program consistency audit on December 11, 2009, and has identified, in the enclosure, areas where additional information is needed to complete the review. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Ms. Angela Krainik, of APS staff, and a mutually agreeable date for your response was determined to be 45 calendar days from the date of this letter. If you have any questions, please contact me at 301-415-1906 or by e-mail at Lisa.Regner@nrc.gov.

Sincerely,

/RA/

Lisa M. Regner, Sr. Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-528, 50-529, and 50-530

Enclosure:
As stated

cc w/encl: See next page

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DATE	12/22/09	12/22/09	12/22/09	12/24/09

OFFICE	PM:RPB2:DLR
NAME	LRegner (Signature)
DATE	12/29/09

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Letter to Randall K. Edington from Lisa M. Regner dated December 29, 2009

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3, LICENSE RENEWAL APPLICATION

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Palo Verde Nuclear Generating Station,
Units 1, 2, and 3

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PALO VERDE NUCLEAR GENERATING STATION
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION

RAI B2.1.2-1

Background:

Element 5, "Monitoring and Trending" of the Water Chemistry Aging Management Program (AMP) in the Generic Aging Lessons Learned (GALL) Report, Section XI.M2, indicates that whenever corrective actions are taken to address an abnormal chemistry condition, increased sampling is utilized to verify the effectiveness of these actions.

Issue:

Palo Verde Nuclear Generating Station (PVNGS) license renewal application (LRA), Appendix B, Section B.2.1.2 indicates that the applicant's Water Chemistry Program will be consistent with the GALL Report, Section XI.M2, and does not take any exceptions. It was indicated in the applicant's basis document PVNGS-AMP-B2.1.2, Water Chemistry, in Section 3.5 on page 17, that the PVNGS Water Chemistry Program increases the sampling frequency when a monitoring instrument is out of service. It is not clear to the staff if PVNGS is increasing the sampling frequency to verify that corrective actions are effective.

Request:

Provide additional information clarifying if PVNGS increases the sampling frequency in order to verify the effectiveness of corrective actions used to address an abnormal condition. If PVNGS does not increase sampling frequency, provide additional information on how PVNGS plans to take an exception to the GALL Report, and what alternative technique will be used to address the effectiveness of corrective actions.

RAI B2.1.3-01

Background:

GALL Report, AMP XI.M3, "Reactor Head Closure Studs," program Element 4, "detection of aging effects," states that "Examination category B-G-1 for pressure-retaining bolting greater than two inches diameter in reactor vessels specifies … surface and volumetric examination of studs when removed."

Issue:

Based on its review of the PVNGS Reactor Head Closure Studs program, the staff has determined that only volumetric examinations are provided for studs when removed from the reactor flange.

Request:

- Explain why this is not identified as an exception to the GALL Report's recommendations or identify it as an exception to the GALL Report; and

- Justify why volumetric examination (only) of reactor head closure studs when removed provides adequate detection of the aging effects for which the Reactor Head Closure Stud program is credited.

RAI B2.1.4-1

Background:

In the GALL Report AMP XI.M10 "Boric Acid Corrosion," covers any structures or components on which boric acid corrosion may occur. The scope of the program includes all components that contain borated water that are in proximity to structures and components that are subject to an aging management review (AMR).

Issue:

In Table 3.2.2-4 of the LRA, a line item for the heat exchanger (shutdown cooling) is indicated as carbon steel with stainless steel cladding in an environment of treated borated water. The applicant specifies that this line item is to be covered under the Water Chemistry Program for the aging effect of loss of material. The applicant further states that the Boric Acid Corrosion Control Program is consistent with GALL Report AMP XI.M10; however, the GALL Report recommends that AMP XI.M10 be applied to manage aging of the subject material/environment combination. It is not clear to the staff how the carbon steel heat exchanger component, clad with stainless steel, is managed sufficiently by the Water Chemistry Program rather than the Boric Acid Corrosion Control Program.

Request:

Provide additional information on how the applicant's AMP for managing the aging effects of the subject heat exchanger are consistent with the recommendations in the GALL Report.

RAI B2.1.7-01

Background:

In GALL AMP XI.M18 "Bolting Integrity," the "program description" and program elements 1, 3, 4, and 6 (scope of program, parameters monitored/inspected, detection of aging effects, and acceptance criteria) all include recommendations for aging management of structural bolting and indicate that structural bolting is within the scope of the program.

The applicant's description of PVNGS AMP B2.1.7 "Bolting Integrity," in the LRA does not include mention of structural bolting as being within the scope of the PVNGS Bolting Integrity program. However, the LRA also does not identify exceptions to elements of GALL AMP XI.M18, with regard to aging management of structural bolting.

Issue:

In its review of the applicant's Program Evaluation Document for AMP B2.1.7 and through discussions with the applicant, the staff determined that structural bolting is not included within the scope of AMP B2.1.7. The staff does not understand why aging management of structural bolting by other AMPs, in lieu of AMP B2.1.7, is not identified as an exception to program element of GALL AMP XI.M18.

Request:

- Explain why use of AMPs different from the Bolting Integrity program for aging management of structural bolting was not identified as an exception to GALL AMP XI.M18.
- Identify what PVNGS AMPs provide aging management for structural bolting.
- Provide justification that the AMP(s) used for aging management of structural bolting are suitable for managing the aging effects in structural bolting for which the GALL Report credits AMP XI.M18 and provide aging management equivalent to what is recommended in GALL AMP XI.M18.

RAI B2.1.7-02

Background:

In LRA Section B2.1.7, the exception to Element 3, "parameters monitored/ inspected" describes a discussion of bolt preload in EPRI NP-5769, Volume 2, Section 10, with regard to job inspection of torque. The exception goes on to say that torque values are provided in procedures, vendor instructions, design documents or specifications and include consideration of expected relaxations of the fasteners over the life of the joint and gasket stress in the application of pressure closure bolting.

Issue:

Although the information in the LRA suggests that the applicant manages loss of preload by control of design and maintenance activities, and not by inspection activities, the staff has determined that the LRA does not provide a clear description of the exception of program Bolting Integrity program Element 3.

Request:

- Provide a clear description of the exception to program Element 3, identifying the specific recommendation in Element 3 to which the exception applies and specifically what the PVNGS Bolting Integrity program does in lieu of the GALL Report's recommendations.
- Justify that PVNGS' actions taken in lieu of the actions recommended in the GALL Report are adequate to manage the aging effect(s) for which the GALL AMP is credited.

RAI B2.1.7-03

Background:

GALL AMP XI.M18, “Bolting Integrity,” program Element 2, “preventive actions,” states that, “Selection of bolting material and the use of lubricants and sealants is in accordance with the guidelines of EPRI NP-5769, and the additional recommendations of NUREG-1339, to prevent or mitigate degradation and failure of safety-related bolting.” NUREG-1339 emphasizes a recommendation in EPRI NP-5769 against the use of molybdenum disulfide (MoS_2) as a thread lubricant for safety-related bolting because it may create conditions favorable for SCC when exposed to primary system water.

Issue:

During review of GALL AMP XI.M3, “Reactor Head Closure Studs,” the staff learned that the thread lubricant used for the reactor head studs is Lubriko L1G615, which contains one percent molybdenum disulfide. Although reactor head studs are not within the scope of the Bolting Integrity program and GALL AMP XI.M3 does not include recommendations related specifically to molybdenum disulfide, the staff is concerned that thread lubricants containing molybdenum disulfide are used on reactor head studs and may be used in other bolting applications at PVNGS.

Request:

- Clarify whether thread lubricants containing molybdenum disulfide are used for bolting that is included within the scope of the Bolting Integrity program.

- If such lubricants are used for bolting that is included within the scope of the Bolting Integrity program, explain why this was not identified as an exception to the “preventive actions” program element in GALL AMP XI.M18, “Bolting Integrity.”

- Explain how the aging effects of concern in NUREG-1339 will be managed during the period of extended operation for both GALL AMP XI.M3 and XI.M18.

RAI B2.1.9-1

Background:

Element 2, “Preventive Actions” of the Open-Cycle Cooling Water System Aging Management Program in the GALL Report, Section XI.M20, indicates that the system components are constructed of appropriate materials and lined or coated to protect the underlying metal surfaces from being exposed to aggressive cooling water environments.

Issue:

In the PVNGS LRA, Appendix B, Section B.2.1.9 indicates that the applicant's Closed-Cycle Cooling Water Program will be consistent with the GALL Report, Section XI.M20. It was indicated in the applicant's basis document PVNGS AMP-B2.1.9, Closed-Cycle Cooling Water System, in Section 3.3 on page 13, that PVNGS does not take credit for coatings and linings to mitigate the effects of aging. However, from further discussion with the applicant it was identified that the piping systems are internally coated. Coating degradation could lead to a reduction in heat transfer or create crevices that lead to a more aggressive corrosion environment. It is not clear to the staff how PVNGS has taken into consideration the aging of the pipe internal coating, which could affect the function of the system if the coating is degraded.

Request:

Provide additional information that accurately depicts the material arrangement of the open cycle cooling water system including linings or coatings. Provide additional information on how the coating system is managed for aging affects.

RAI B2.1.10-1

Background:

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54.4(a) provides the regulations for what plant systems, structures, and components (SSCs) are within the scope of the license renewal process. These include items under 10 CFR 54.4(a)(2), which are all nonsafety-related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified in safety-related SSCs included in the scope of the license renewal. The Program Description of the Closed-Cycle Cooling Water Aging Management Program in NUREG-1801, Revision 1, Section XI.M21 indicates that the program includes a) preventive measures to minimize corrosion and SCC and (b) testing and inspection to monitor the effects of corrosion and SCC on the intended function of the component.

Issue:

PVNGS LRA, Appendix B, Section B.2.1.10 indicates that the applicant's Closed-Cycle Cooling Water Program will be consistent with the NUREG-1801, Revision 1 Section XI.M21 with various exceptions. It was indicated in both the LRA B2.1.10 Program Description and the applicant's basis document PVNGS AMP-B2.1.10, Closed-Cycle Cooling Water System, in Section 2.1 on page 5, that the program will not conduct internal inspections or performance testing for components in scope of license renewal under 10 CFR 54.4(a)(2). It is not clear to the staff what the technical basis is for limiting the prescribed guidance in the GALL Report, based on how a component was scoped into the license renewal process.

Request:

Provide justification for limiting the internal inspections and performance testing on components based upon the criteria that was used to scope these components into the license renewal process.

RAI B2.1.10-2

Background:

The Preventative Actions indicate of the Closed-Cycle Cooling Water System AMP in the GALL Report, Section XI.M21, indicate that this program relies on the use of appropriate materials, lining, or coating to protect the underlying metal surfaces and maintain system corrosion inhibitor concentrations within the specified limits of EPRI TR-107396 to minimize corrosion and SCC.

Issue:

In the LRA, Appendix B, Section B.2.1.10 indicates that the applicant's Closed-Cycle Cooling Water Program will be consistent with the GALL Report, Section XI.M21, with various exceptions. It was indicated in the applicant's basis document AMP-B2.1.10, Closed-Cycle Cooling Water System, in Section 3.2 on page 15, that PVNGS takes exception to an aluminum "window" in the essential cooling water system. This exception is to employ the GALL Report, AMP XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components for this particular part of the system. In addition, further discussion with the applicant indicated that the material may not be aluminum.

Request:

Provide additional information on the actual material of the "window." If the window is not aluminum, but a different material, provide additional information on what aging management program will be used. If the window is indeed aluminum, provide a technical basis why the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is adequate to inspect the aluminum component.

RAI B2.1.10-3

Background:

The Parameters Monitored/Inspected element of the Closed-Cycle Cooling Water System AMP in the GALL Report, Section XI.M21, recommends managing the effects of corrosion and SCC by testing and inspection in accordance with guidance in EPRI TR-107396 to evaluate system and component conditions.

Issue:

In the LRA, Appendix B, Section B.2.1.10 indicates that the applicant's Closed-Cycle Cooling Water Program will be consistent with GALL Report, Section XI.M21, with various exceptions.

- In Section 3.3 on page 20, the exception (exception g) is to conduct periodic monitoring and inspection for certain heat exchangers, which do not have a license renewal heat transfer function, but are included as a pressure boundary. It is not clear to the staff how water chemistry control alone will ensure adequate aging management, especially associated with loss of material.

- In Section 3.3 on page 19, the exeption is to conduct visual or non-destructive examination inspections for ventilation cooling coils, which do not have license renewal heat transfer function, but are included as a pressure boundary. It is not clear to the staff how water chemistry control, preventative maintenance, and the performance testing will ensure the adequate aging management, especially associated with loss of material.

- In Section 3.3 on page 29, the exception is to conduct periodic monitoring and inspection for regular, periodic inspection and testing of Reactor Coolant Hot Leg Sample Cooler. It is not clear to the staff how water chemistry control with operator observation of component performance is adequate for aging management, especially associated with loss of material.

Request:

- Provide additional information describing why an inspection technique is not being utilized to monitor the aging affect of these heat exchangers with regard to loss of material, and how water chemistry control alone is adequate to managing the aging degradation.

- Clarify how the hot water chemistry control in combination with the preventative maintenance and performance testing will adequately managing the aging affects associated with the ventilation cooling coils.

- Provide additional information describing why an inspection technique is not being utilized to monitor the aging affect of the Reactor Coolant Hot Leg Sample Cooler and how water chemistry control alone is adequate to managing the aging degradation.

RAI B2.1.12-1

Background:

GALL AMP XI.M26, Element 3, “Parameters Monitored/Inspected” states:

> The diesel-driven fire pump is under observation during performance tests such as flow and discharge tests, sequential starting capability tests, and controller function tests for detection of any degradation of the fuel supply line.

GALL AMP XI.M26, Element 6, “Acceptance Criteria” states:

> No corrosion is acceptable in the fuel supply line for the diesel-driven fire pump.

The AMP basis document for the Fire Protection program, AMP-B2.1.12, Revision 3, in Section 3.3, Parameters Monitored or Inspected, states:

> The fuel oil supply line is managed by the Fuel Oil Chemistry and External Surface Monitoring AMPs. The Fuel Oil Chemistry Program uses One-Time Inspection Program to verify the effectiveness of the chemistry program.

The AMP basis document for the Fire Protection program, AMP-B2.1.12, Revision 3, in Section 3.6, Acceptance Criteria, states:

> The Fuel Oil Chemistry Program uses One-Time Inspection Program to verify the effectiveness of the chemistry program, ensuring there is no loss of function due to aging of the fuel oil supply line.

Issue:

Procedure 14FT-0FP05, Revision 19, Monthly Diesel Driven Fire Pump Start and Run, which is referenced in the Fire Protection Program basis document, states in Appendix A to visually inspect the diesel fuel oil supply line for signs of degradation and references the source of the inspection as the LRA.

Request:

Please confirm which program is used for performing this inspection and identify where the acceptance criterion for the inspection is specified.

RAI B2.1.12-2

Background:

GALL AMP XI.M26, Element 4, “Detection of Aging Effects” states:

> Visual inspections of the halon/CO2 fire suppression system detect any sign of added degradation, such as corrosion, mechanical damage, or damage to dampers. The periodic function test and inspection performed at least once every six months detects degradation of the halon/CO2 fire suppression system before the loss of the component intended function.

Issue:

LRA Section B2.1.12 has taken an exception that the testing and inspection frequency is once every 18 months. By letter dated December 7, 2009, APS Amendment No. 3 to the LRA changed the testing and inspection frequency for dampers to once every 54 months.

Request:

Provide a technical justification for the 54-month testing and inspection interval.

RAI B2.1.16-1

Background:

In the GALL Report, AMP XI.M32, Element 10 “operating experience (OE)” states that this program applies to potential aging effects for which there are currently no OE indicating the need for an AMP. Nevertheless, the elements that comprise these inspections (e.g., the scope of the inspections and inspection techniques) are consistent with industry practice.

Issue:

The LRA states that a review of the PVNGS plant-specific OE associated with the inservice inspection (ISI) Program has not revealed any ISI adequacy issues. Although there is no plant-specific OE associated with the PVNGS American Society of Mechanical Engineers (ASME) Section XI ISI Program that revealed ISI adequacy issues, any OE resulting from maintenance activities should be included for systems and components that will be subjected to one-time inspection.

Request:

Provide a summary of OE resulting from observations of loss of material, cracking and loss of heat transfer resulting from maintenance and associated corrective action activities.

RAI B2.1.16-2

Background:

In the GALL Report, AMP XI.M32, Element 4 “detection of aging effects” recommends enhanced visual inspection (EVT-1 or equivalent) and/or volumetric inspection (RT or UT) for detection of cracking due to SCC or cyclic loading. In addition to enhanced visual inspection and/or volumetric inspection, the One-Time Inspection Program (B2.1.16) provides an option to use surface examination (PT or MT) to detect cracking.

Issue:

In the Nuclear Administrative and Technical Manual, One-Time Inspection Program (73DP-9EE05), it is stated that examination techniques will be selected as appropriate for each specific one-time inspection. It is not clear how surface examinations will be used to detect cracking.

Request:

Will surface examination be used instead of enhanced visual or volumetric inspection? If surface examination is to be used to detect SCC, will the examination be on the wetted surface of the component?

RAI B2.1.18-1

Background:

The LRA states that AMP B.2.1.18, "Buried Piping and Tanks Inspection," is a new program with exceptions to elements 1, 2, and 6 of the GALL Report, AMP XI.M34. The description of AMP B.2.1.18 in the LRA includes a discussion of relevant plant-specific OE.

Issue:

There have been a number of recent industry events involving the leakage from buried piping (e.g., Oyster Creek Nuclear Generating Station, Indian Point Nuclear Generating Units 2 and 3, etc.) due to corrosion stemming from coating damage during backfill of piping, failure of fiberglass piping, and failure of buried piping in and around piping penetrations. Based on the information provided in the LRA, it is not clear to the staff how these and other examples of relevant industry operating experience was considered during the development of AMP B.2.1.18.

Request:

Please describe how relevant industry operating experience was considered during the development of AMP B.2.1.18.

RAI B2.1.19-1

Background:

GALL AMP XI.M35, Element 3, "parameters monitored/inspected," states that inspections will detect cracking in ASME Code Class 1 small-bore piping.

Issue:

The LRA states socket welds that fall within the weld examination sample will be examined following ASME Section XI Code requirements. The LRA further states that if a qualified volumetric examination procedure for socket welds endorsed by the industry and the U.S. Nuclear Regulatory Commission (NRC) is available and incorporated into the ASME Section XI at the time of PVNGS small-bore socket weld inspections then volumetric examinations will be conducted on small-bore socket welds. The staff notes that if a volumetric examination procedure for socket welds endorsed by the industry and the NRC is not available and incorporated into the ASME Section XI at the time of PVNGS small-bore socket weld inspections then present ASME Section XI Code requirements will be used for examination of

socket welds. The staff also notes that the present ASME Section XI Code only requires surface examination for small-bore piping; however, surface examination will not detect cracking that initiates on the inside of the piping before leakage occurs.

Request:

If a volumetric examination procedure for socket welds endorsed by the industry and the NRC is not available and incorporated into the ASME Section XI at the time of PVNGS small-bore socket weld inspections, what alternative method will used to detect cracking that initiates from the inside of socket welds?

RAI B2.1.19-2

Background:

In the GALL Report, AMP XI.M35, Element 1, "scope of program," recommends using guidelines in EPRI Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)," January 2001, to identify piping susceptible to potential effects of thermal stratification or turbulent penetration. The LRA states that guidelines from EPRI TR-112657, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," Revision B-A, were used for identifying susceptible piping instead of EPRI Report 1000701. The LRA further states that the recommended inspection volumes for both methods are identical.

Issue:

Although the inspection volumes are identical, it is not clear if the welds with the highest likelihood of degradation will be inspected, e.g., welds with the highest stress but not necessarily highest risk category.

The staff reviewed the applicant's selection of welds that would be subjected to volumetric one-time inspection based on the risk-informed method and found that only butt welds would be inspected. The staff noted that although the butt welds to be inspected have the highest risk, the environment of butt welds is not the same as for socket welds due to the crevice inherent in socket welds; the crevice could lead to corrosion or SCC in socket welds which could be missed if only butt welds are inspected.

Request:

Are locations that are to be inspected according to risk-informed methods also bound by the locations of the highest likelihood of degradation? Provide plans to augment the risk-informed selection of locations of small-bore piping for volumetric inspection to include socket welds.

RAI B2.1.19-3

Background:

The LRA small bore piping AMP states that the program is consistent with the program elements in the GALL Report AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small

Bore Piping." It also states that PVNGS has experienced cracking of ASME Code Class 1 small-bore piping.

Issue:

Based on GALL Report Section XI.M35 recommendation, periodic inspection of the subject piping is needed as managed by a plant-specific AMP.

Request:

Either provide a plant-specific AMP that includes periodic inspections to manage aging, or provide justification why a plant-specific AMP is not necessary for ASME Code Class 1 small-bore piping.

RAI B2.1.20-1

Background:

GALL Report, AMP XI.M36, "External Surfaces Monitoring," includes a provision for inspecting areas that are inaccessible under normal operating conditions. AMP XI.M36 states that surfaces that are inaccessible or not readily visible during plant operations are inspected during refueling outages. Surfaces that are inaccessible or not readily visible during both plant operations and refueling outages are inspected at such intervals that would provide reasonable assurance that the effects of aging will be managed such that applicable components will perform their intended function during the period of extended operation.

Issue:

The applicant has indicated in its basis document, PVNGS AMP Evaluation Report External Monitoring Program - B2.1.20, that it plans to manage the aging effects of the elastomers by using physical manipulations to detect hardening and loss of strength of elastomers rather than visual inspection. The applicant has indicated that the physical manipulations are not possible for all instances as there are inaccessible regions that preclude any inspection techniques beyond visual inspection. This potentially leaves certain elastomeric components insufficiently assessed in the inspection process as their respective degradation can not be assessed solely by visual means.

Request:

Provide details on what alternative method will be used to adequately manage those elastomeric products not accessible for physical manipulation so that loss of ductility and aging artifacts specific to elastomeric materials will be detected. If the management of inaccessible components will involve sampling or inspection of equivalent or analogous component/materials/environments, then provide details on how those results will be applied to the elastomeric materials not accessible for physical manipulation.

RAI B2.1.20-2

Background:

GALL AMP XI.M36 is based on managing aging effects of steel through visual inspections. Based on the observable degradation artifacts intrinsic to steel, the GALL AMP states that "visual inspections are expected to identify loss of material due to general corrosion in accessible steel components. Loss of material due to pitting and crevice corrosion may not be detectable through these same visual inspections, however, general corrosion is expected to be present and detectable such that, should pitting and crevice corrosion exist, general corrosion will manifest itself as visible rust or rust byproducts (e.g., discoloration or coating degradation) and be detectable prior to any loss of intended function."

Issue:

Within the LRA, the applicant has presented an exception to GALL AMP XI.M36 with the use of the AMP to cover other materials (aluminum, copper alloy, and elastomers). However, the sufficiency of visual inspection for observing steel degradation is founded on the color change upon degradation and, under with more advanced degradation, disengagement of corrosion products from the metal surface. Compared to steel, aluminum is not as conducive to visual inspection to detect degradation. Under the pertinent plant environments and conditions, the degradation of aluminum involves the formation of thin films of Al_2O_3 indistinguishable from its presence in the initial service condition. Until the degradation is so extensive that component functionality is compromised, the extent of corrosion is not conducive to detection by the visual inspection methods used for steel.

Request:

Explain how visual inspection can be applied to assess corrosion on aluminum components, specifically the loss of material. Provide details if other contact methods or optical instruments are intended for use in the inspection.

RAI B2.1.20-3

Background:

The GALL Report recommends the Compressed Air Monitoring AMP XI.M24 for managing the aging of components in the compressed air system exposed to condensation.

Issue:

The applicant has claimed that their compressed air system does not include components/materials that are subjected to an environment of potential condensation. The piping and valves included within LRA Table 3.3.2-9 indicate that the applicant identifies no aging effects due to condensation that require management. However, further discussions with the applicant indicated that there are piping and valves in the plant compressed air system that are subject to potential condensation from indoor plant air.

Request:

The applicant is asked to clarify how the aging effects on piping and valves within the compressed air exposed to condensation will be managed for loss of material and other potential aging effects.

RAI B2.1.22-1

Background:

The GALL Report says that indications of various corrosion mechanisms or fouling that would impact component intended function are reported and will require further evaluation. The acceptance criteria are established in the maintenance and surveillance procedures or other established plant procedures. If the results are not acceptable, the corrective action program is implemented to assess the material condition and determine whether the component's intended function is affected.

Section B2.1.22, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, includes in its scope fire water system piping to perform visual inspections that are capable of evaluating wall thickness and the inner diameter of the piping as it applies to the design flow of the fire protection system.

Issue:

The information provided in the LRA Section B2.1.22, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, does not provide a specific method for determining the wall thickness of this fire protection piping and does not provide a specific method for determining indications of narrowing of the pipe diameter.

Request:

Describe how the wall thickness and narrowing of the pipe diameter will be determined by visual inspection and provide acceptance criteria.

RAI B2.1.23-1

Background:

In the GALL Report, AMP XI.39 recommends in Element 6, acceptance criteria, that particle concentration will be determined in accordance with industry standards such as SAE749D, ISO 4406, ISO 112218, and NAS 1638. Water and particle concentration will not exceed limits based on manufacturer's recommendations or industry standards recommended for each component type. Viscosity bands are based on a tolerance around the base viscosity of the lubricating oil as recommended by the component manufacturer or industry standards. Metal limits as determined by spectral analysis and ferrography will be based on original baseline data and manufacturer's recommendations, industry standards, or other justified basis.

Issue:

The applicant stated in Lubricant Evaluations, Revision 12, 37DP-9MP04, that exceeding testing criteria of Appendix A is not necessarily the point where lubricating oil is non-conforming. The sources of acceptance criteria are not identified. Lubricant Evaluations, Revision 12, 37DP-9MP04, allows use of lubrication oil with parameters outside the limits of acceptance criteria based on a justification for doing so and a sampling interval is such that the condition of the oil is adequately monitored.

Request:

Provide sources of the acceptance criteria. Provide justification for continued use of lubricating oil outside manufacturer's recommendations or industry standards.

RAI B2.1.23-2

Background:

In the GALL Report, AMP XI.M39, Element 3, "parameters monitored/inspected," recommends monitoring the Neutralization Number in lubricating oils.

Issue:

In the AMP B.2.1.23, Evaluation Report for Lubricating Oil Analysis, the applicant stated that diesel engine lubricating oil is tested for the Total Base Number but not the Total Acid Number, because the Total Acid number is of limited use for diesel engine lubrication oil applications; additionally, it is stated that the Total Acid Number is used for evaluating lubrication oils in other components. It is not clear why only the Total Base Number is used for monitoring lubricating oil in diesel engines and what lubricating oil of other components will be monitored for Total Acid Number.

Request:

Provide justification for only monitoring the Total Base Number for lubricating oil in diesel engines. Provide information regarding where the Neutralization Number, the Total Acid Number and the Total Base Number is used for monitoring lubricating oil in other components.

RAI B2.1.23-3

Background:

In the GALL Report, AMP XI.39 recommends in Element 6, acceptance criteria, that particle concentration will be determined in accordance with industry standards such as SAE749D, ISO 4406, ISO 112218, and NAS 1638.

Issue:

The applicant stated in the AMP basis document, Lubricating Oil Analysis, B2.1.23, that the Lubricating Oil Analysis Program relies upon elemental analysis as described in ASTM D 6595, "Determination of Wear Metals and Contaminants in Used Lubricating Oils or Used Hydraulic Fluids by Rotating Disc Electrode Atomic Emissions Spectroscopy," to determine wear metal content in lieu of particle counting to characterize lubricating oil cleanliness in diesel engine applications. The applicant further stated that elemental analysis provides a greater degree of insight into lubricant condition over particle counting. The staff reviewed ASTM D 6595 and Lubricant Evaluations, Revision 12, 37DP-9MP04 and found no acceptance criteria for elemental analysis.

Request:

Provide the acceptance criteria for elemental wear metals in lubricating oil. Provide information indicating that elemental analysis provides a greater degree of insight into lubricant condition over particle counting.

RAI B2.1.24-1

Background:

The GALL Report, XI.E1, Scope of Program, states that this inspection program applies to accessible electrical cables and connections within the scope of license renewal that are installed in adverse localized environments. Non-EQ electrical containment penetrations may be installed in adverse localized environments.

Issue:

The scope of program in the LRA, B2.1.24, does not include electrical containment penetrations.

Request:

Explain why electrical containment penetrations are not included in the scope of Electrical Cables and Connections.

RAI B2.1.25-1

Background:

The GALL Report, XI.E2, Scope of Program, states that this program applies to electrical cables and connections (cable system) used in circuits with sensitive, high voltage, low-level signals such as radiation monitoring and nuclear instrumentation that are subject to AMR. The LRA, AMP B2.1.25, under the same program attribute, only includes the ex-core neutron monitoring system cable system (nuclear instrumentation).

Issue:

The scope of AMP B2.1.25 does not include high range radiation monitoring.

Request:

Explain how the scope of the PVNGS AMP is consistent with the GALL Report, XI.E2, considering the fact that the PVNGS AMP does not include high range radiation monitoring.

RAI B2.1.25-2

Background:

The GALL Report, XI.E2, Detection of Aging Effects, states that in cases where a calibration or surveillance program does not include the cabling system in the surveillance, the applicant will perform cable system testing. In the LRA, AMP B2.1.25, under the same program attribute, the applicant states the ex-core neutron monitoring system is calibrated every 18 months in accordance with scheduled surveillance and maintenance testing procedures.

Issue:

The GALL Report recommends cables which are disconnected during scheduled surveillance are to be tested separately.

Request:

Are the ex-core neutron monitoring cables disconnected during the 18-month scheduled surveillance? If they are, is cable testing performed? If they are not, provide plant surveillance procedure that shows that these cables are not disconnected.

RAI - B2.1.26-1

Background:

The GALL Report, AMP XI.E3, states that the program applies to inaccessible medium voltage cables that are exposed to significant moisture. Significant moisture is defined as periodic exposures to moisture that last for more than a few days. AMP XI.E3 also states that periodic actions are taken to prevent cables from being exposed to significant moisture. AMP XI.E3 further states that inspection for water collection should be performed based on actual plant experience with water accumulation in the manhole with an inspection frequency of at least every two years.

Issue:

The staff's independent review and the applicant's operating experience review references condition reports/disposition request (CRDR) documenting cases of water intrusion and significant moisture (water intrusion and cable submergence) inconsistent with GALL AMP XI.E3 scope of program.

Request:

- Describe how PVNGS is consistent with the GALL Report, AMP XI.E3 program element, "Scope of Program," when cables are exposed to significant moisture (i.e., more than a few days).

- Describe how plant OE and CRDR documentation will be used to develop the Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements AMP to minimize the potential for inaccessible medium voltage cables to be exposed to significant moisture (i.e., inspection frequency determinations including periodic and event driven significant moisture exposure and corrective action).

RAI B2.1.26-2

Background:

Standard Review Plan – License Renewal Section 3.6.2 includes acceptance criteria for evaluating the Updated Final Safety Evaluation Report (UFSAR) summary description including that the applicant has provided information equivalent to that in SRP-LR Table 3.6-2 includeing definitions of significant moisture, significant voltage, and minimum electrical manhole inspection frequencies.

Issue:

A staff review of the LRA, Appendix A, Section A1.26, "Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements," finds the applicant's UFSAR summary description is not equivalent to SRP-LR Table 3.6-2 in that the applicant's summary description does not include definitions of significant moisture, significant voltage, and minimum electrical manhole inspection frequencies.

Request:

Discuss why LRA Appendix A, Section A1.26 summary description does not include definitions of significant moisture, significant voltage, and minimum electrical manhole inspection frequencies consistent with SRP-LR Table 3.6-2.

RAI B2.1.27-2

Background:

The GALL Report, AMP XI-S1, "ASME Section XI, Subsection IWE Program," Element 1, recommends inspection of containment pressure-retaining bolting.

Issue:

It is not clear from the review of PVNGS Program Evaluation Report B2.1.27 how the pressure retaining high strength bolts are monitored or inspected for aging management.

Request:

- Explain why pressure retaining high strength bolts are not included in Element 1 of PVNGS Program B2.1.27.

- Explain how the recommendations contained in EPRI NP-5769, EPRI TR -104213, and NUREG-1339 to prevent or mitigate degradation and failure of structural bolts with actual yield strength of 150,000 pounds per square inch are implemented for containment pressure retaining bolts.

RAI B2.1.27-3

Background:

In the GALL Report, AMP XI-S1, "ASME Section XI, Subsection IWE Program," Element 10 recommends that the applicant's ASME Section XI, Subsection IWE Program to consider OE.

Issue:

It is not clear from the review of PVNGS Program Evaluation Report B2.1.27 if the applicant has considered liner plate corrosion concerns identified in Information Notice (IN) 2004-09, and recent industry OE related to Beaver Valley Power Station for liner plate corrosion.

Request:

Explain if the applicability of IN 2004-09 and Beaver Valley Power Station containment liner plate corrosion has been considered for PVNGS, Units 1, 2, and 3, containments to avoid similar problems.

RAI B2.1.27-4

Background:

In the GALL Report, AMP XI-S1, "ASME Section XI, Subsection IWE Program," Element 6 recommends that containment steel shell or liner loss exceeding 10 percent of the nominal wall thickness, or material loss projected to exceed 10 percent of the nominal wall thickness prior to the next examination, shall be documented. Such areas are to be accepted by engineering evaluation or corrected by repair/replacement activities in accordance with IWE-3122.

Issue:

PVNGS inspection report 09-VT-1004 documented local degradation of containment liner plate in Area 3 with loss of thickness of 0.04 inch. This local loss of thickness of 0.040 inch is more than 10 percent of the measured containment liner plate thickness of 0.263 to 0.27 inch minus the coating.

Request:

Explain the basis for acceptance of local loss of thickness of greater than 10 percent of the nominal wall thickness.

RAI B2.1.28-1

Background:

In the GALL Report, AMP XI-S2, "ASME Section XI, Subsection IWL Program," Element 10 states that implementation of ASME Section XI, Subsection IWL, in accordance with 10 CFR 50.55a, is a necessary element of aging management for concrete containments through the period of extended operation.

Issue:

The PVNGS AMP B2.1.28, Element 10 states that existing PVNGS Tendon Integrity Surveillance procedures are regulated per and in compliance with RG 1.35.

Request:

Explain why PVNGS Tendon Integrity Surveillance procedures are regulated by RG 1.35 instead of 10 CFR 50.55a.

RAI B2.1.28-2

Background:

The GALL Report, AMP XI-S2, "ASME Section XI, Subsection IWL Program," Element 4, and ASME Section IWL-2410 require that the inspection of concrete surfaces are required at one, three, and five years following the structural integrity test. Thereafter, inspections are performed at five year intervals.

Issue:

The PVNGS AMP Program B2.1.28, Element 4 states that the plant is beyond 10 years of commercial operation and the frequency of concrete exams is 10 years, plus or minus one year. Unit 1 will be inspected at five years, and every 10 years thereafter. Units 2 and 3 will be inspected at 10 years, and every 10 years thereafter.

Request:

Provide justification for this exception to the GALL and IWL requirement.

RAI B2.1.29-1

Background:

IN 2009-04 discusses age-related degradation of mechanical constant supports observed at PVNGS, Unit 2.

Issue:

GALL Report AMP XI.S3 refers to the ASME Section XI, Subsection IWF and provides the requirements for ISI of all piping supports including constant supports. This program requires a periodic visual inspection. However, PVNGS license renewal aging management industry OE report for AMP XI.S3 (Document 2004-16) states that the degradation identified in IN 2009-04 for constant (spring) supports is not age-related.

Request:

Explain the basis of the statement made in Document 2004-16 that the constant supports degradation identified in IN 2009-04 is not age-related and does not affect the structural steel supports that transfer loads from the constant springs to the building structure. Include details of the root cause analyses for the mechanical constant supports identified in IN 2009-04. In addition, explain how the age-related degradation for other constant supports will be managed.

RAI B2.1.32-1

Background:

Industry standards (e.g., ACI 349.3R-96) identified in the GALL Report Structures Monitoring Program suggest a five-year inspection frequency for structures exposed to natural environment, structures inside primary containment, continuous fluid-exposed structures, and structures retaining fluid or pressure, and a ten-year inspection frequency for below-grade structures and structures in a controlled interior environment.

Issue:

Element 4 of the applicant's Structures Monitoring Program states that inspections include SSCs that are identified for each topical area with frequencies that provide assurance that selected SSCs will not degrade or drastically change their ability to protect or support safety systems or components. The monitoring is scheduled to result in total observation of all systems on a frequency of approximately 10 years. To include a cross section of all three units, observations are conducted in different areas of different units. This ensures that within a thirty-year cycle, all units are monitored and all areas of each unit are monitored. It is not clear to the staff that all SSC's at each unit inspected under this AMP are in compliance with the industry standards inspection frequency (e.g., as noted in ACI 349.3R-96).

Request:

Please explain in more detail the inspection frequency for each unit and the plant in general. If the inspection interval exceeds the industry standard, clearly explain the basis for extending the interval and explain how the chosen interval will adequately manage aging during the period of extended operation.

RAI B2.1.32-2

Background:

In the GALL Report AMP XI.S6, ACI 349.3R-96 is noted to provide an acceptable basis for developing acceptance criteria for concrete structural elements, steel liners, joints, coatings, and waterproofing membranes.

Issue:

Element 6 of the Structures Monitoring Program basis document provides guidance for the determination of performance criteria of SSCs included within the scope of the Maintenance Rule. SSCs deficiencies are categorized as minor, adverse, or critical and depending on the deficiency categorization the SSCs are considered to be acceptable or unacceptable. It is unclear to the staff if ACI 349.3R-96 provides the basis to establish the deficiency categorizations or if some other basis is utilized and what the criteria are to categorize a SSC deficiency as minor, adverse, or critical. This issue applies to all programs under the Structures Monitoring Program (i.e. RG 1.127 and Masonry Wall Programs).

Request:

Provide the criteria used to categorize a SCC deficiency as minor, adverse, or critical. Include references to the site documents or procedures which contain the categorization criteria.

RAI B2.1.32-3

Background:

IN 2004-05 identified leakage of spent fuel pools at several nuclear power plants.

Issue:

Spent fuel pool leakage has been identified at PVNGS since 1992. Leakage has been identified in the liner drain system as well as on the outer surfaces of the spent fuel pool concrete walls. Leakage through the spent fuel pool walls may degrade the concrete.

Request:

- Discuss any apparent cause analysis performed, if any, to identify the source of the leakage, as well as corrective actions taken to stop the leakage.

- Explain how the leakage has affected the condition of the concrete and what steps have been taken or will be taken to ensure adequacy of the concrete during the period of extended operation.

- Discuss any actions taken to ensure the leak chase system remains free and clear, allowing the system to properly prevent water from accumulating behind the liner.

RAI B2.1.36-1

Background:

The GALL Report AMP, XI.S6, Structure Monitoring Program, recommends inspecting the exterior of metal enclosed bus (MEB) and accessible gaskets and sealant associated with the exterior of MEBs. In the GALL XI.S6, Structure Monitoring Program, under acceptance criteria, it states that for each structure/aging effect combination, the acceptance criteria are selected to ensure that the need for corrective actions will be identified before loss of intended functions.

Issue:

Under Element 6, Acceptance Criteria, the applicant did not specify the acceptance criteria for inspecting the exterior of MEBs including gasket and sealants.

Request:

Provide acceptance criteria for inspecting the exterior of MEBs under Element 6.

RAI B3.1-1

Background:

The Metal Fatigue of Reactor Coolant Pressure Boundary AMP in the GALL Report, Section X.M1, monitors and tracks the number of critical thermal and pressure transients for the selected reactor coolant system components in order not to exceed the design limit on fatigue usage.

Issue:

In the LRA, Appendix B, Section B3.1, states that the calculated design lifetime cumulative usage factor, U, for fatigue is defined by Subparagraph NB 3222.4 of the Section III of the ASME Boiler and Pressure Vessel Code, and an equivalent term I(t) is defined for valves in Paragraph NB 3552. However, ASME Boiler and Pressure Vessel, Section III, Subsection NB, Paragraph NB 3552 defines “Excluded Cycles,” whereas ASME Boiler and Pressure Vessel, Section III, Subsection NB, Paragraph NB 3553 defines “Fatigue Usage.”

Request:

Clarify which ASME Code section will be used in the calculation of the valve fatigue usage term I(t).

RAI B3.1-2

Background:

The Acceptance Criteria element of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP in Section X.M1 of the GALL Report, states that the acceptance criteria involves maintaining the fatigue usage below the design code limit considering environmental fatigue effects as described under the program description.

Issue:

In the AMP basis document, Aging Management Program Evaluation Report, Metal Fatigue of Reactor Coolant Pressure Boundary (PVNGS-AMP-B.1-Revision 1), Section 3.6 states that the program acceptance criteria will be enhanced with action limits that further ensure that fatigue usage factors for reactor coolant pressure boundary components are maintained below the cumulative usage factor of 1.0 established by Section III Subsection NB of the ASME Boiler and Pressure Vessel Code, and that other limits assumed as the basis for safety determinations are maintained. The applicant did not provide a description of these “other limits.”

Request:

What are the other limits that are assumed as the basis for safety determinations to be maintained as described in the enhanced Fatigue Management Program acceptance criteria?

RAI B3.1-3

Background:

The Operating Experience element of Section X.M1 of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP in the GALL Report, Section X.M1 states that the program reviews industry experience regarding fatigue cracking. Applicable experience with fatigue cracking is to be considered in selecting the monitored locations. The NRC issued Regulatory Issue Summary (RIS) 2008-30 on the use of the Green’s functions analysis methodology used to demonstrate compliance with ASME Code fatigue acceptance criteria and its nonconservatism when not correctly applied.

Issue:

The AMP basis document, Aging Management Program Evaluation Report, Metal Fatigue of Reactor Coolant Pressure Boundary (PVNGS-AMP-B.1, Revision 1), states that the methods of the FatiguePro® software that utilizes a Green's transfer function to calculate the fatigue effects of transient cycles are used by the Fatigue Management Program. However, the applicant did not provide information whether it has reviewed RIS 2008-30 in its development of this AMP.

Request:

Describe how the RIS 2008-30 was considered in the development of the Fatigue Management Program and how the results of this review were incorporated into the enhanced Fatigue Management Program.

RAI B3.1-4

Background:

The Detection of Aging Effects element of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP in the GALL Report states that the program provides for periodic update of the fatigue usage calculations.

Issue:

The Program Description element states that the LRA, Section 4.3, AMP monitors and tracks the number of critical thermal and pressure transients for the selected reactor coolant system components. Subsection 4.3.1.4, "Present and Projected Status of Monitored Locations," of the LRA states that a composite worst-case (composite-unit) envelope of operating transients was created including only the highest accumulation of each transient experienced among the three units from 1985 through 2005. However, the applicant did not provide individual plant data for each unit that was used to develop the composite-unit envelope.

Request:

Provide the accumulation of transients for each of the three units that were used to develop the composite-unit envelope for the period from 1985 to 2005.

RAI B3.1-5

Background:

The description of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP in the GALL Report states that the AMP monitors a sample of high fatigue usage locations.

Issue:

Section B3.1 of the LRA states that the locations in which fatigue effects are controlled by "a simple comparison" counting method are those with relatively low design fatigue usage values.

Request:

Provide the following additional information:

- Which locations have been selected for “a simple comparison” counting method,
- How these locations were selected, and
- Define the criteria used to classify fatigue usage values as relatively low fatigue usage values.

RAI B3.1-6

Background:

The Scope of Program element of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP in the GALL Report, Section X.M1 indicates that 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. Section X.M1 of the GALL Report states that the AMP monitors a sample of high fatigue usage locations to include the locations indemnified in NUREG/CR-6260, as minimum, or alternatives proposed based on plant configuration.

Issue:

The AMP basis document, Aging Management Program Evaluation Report, Metal Fatigue of Reactor Coolant Pressure Boundary (PVNGS-AMP-B.1, Revision 1), and License Renewal Commitment No. 39 (LRA Table A4-1) state that the program will be enhanced to include additional locations with high calculated usage factor. However, the applicant did not identify the locations or provide justification for their use.

Request:

Provide additional information on:

- Which locations have been included into the Fatigue Management Program as enhancements to the program,
- How these locations were selected, and
- Define the criteria used to classify fatigue usage values as high fatigue usage values.

RAI B3.1-7

Background:

The Preventive Actions element of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP, Section X.M1 of the GALL Report states that maintaining the fatigue usage factor below the design code limit and considering the effect of the reactor water environment, as described under the program description, will provide adequate margin against fatigue cracking of reactor coolant system components due to anticipated cyclic strains.

Issue:

The AMP basis document, Aging Management Program Evaluation Report, Metal Fatigue of Reactor Coolant Pressure Boundary (PVNGS-AMP.B1, Revision 1) and License Renewal Commitment No. 39 (LRA Table A4-1) state that the Fatigue Management Program will be enhanced with additional cycle count and fatigue usage action limit. The applicant does not provide information on what additional cycle count and fatigue usage action limit will be included into the Fatigue Management Program as enhancements to the program.

Request:

Provide the additional cycle count and fatigue usage action limit that will be included in the Fatigue Management Program as enhancements to the program.

RAI B3.1-8

Background:

The Parameters Monitored/Inspected element of the Metal Fatigue of Reactor Coolant Pressure Boundary AMP, Section X.M1 of the GALL Report states that the program monitors all plant transients that cause cyclic strains, which are significant contributors to the fatigue usage factor. The number of plant transients that cause significant fatigue usage for each critical reactor coolant pressure boundary component is to be monitored. Alternatively, more detailed local monitoring of the plant transient may be used to compute the actual fatigue usage for each transient.

Issue:

The AMP basis document, Aging Management Program Evaluation Report, Metal Fatigue of Reactor Coolant Pressure Boundary (PVNGS-AMP-B.1, Revision 1), states that the scope of the Fatigue Management Program will be enhanced with a revised list of monitored plant transients that contribute to high usage factor. This enhancement is not described in Commitment No. 39 for the Fatigue Management Program.

Request:

Provide additional information on how Commitment No. 39 will be revised to incorporate the enhancement to the Parameters Monitored/Inspected element of the Fatigue Management Program on the revised list of monitored plant transients that contribute to high usage factor. In addition, clarify the implementation schedule for the fatigue usage calculations described in License Renewal Commitment No. 39.

RAI B3.2-1

Background:

GALL AMP X.E1 states that aging evaluations for EQ components that specify a qualification of at least 40 years are considered time-limited aging analyses (TLAA) per license renewal. GALL AMP X.E1 further states that under 10 CFR 54.21(c)(1)(iii), plant EQ programs, which implement the requirements of 10 CFR 50.49 are viewed as AMPs for license renewal. Pursuant to 10 CFR 54.21(c)(1)(iii), an applicant must demonstrate that the effects of aging on the intended function(s) will be adequately managed for the period of extended operation. Applicant Commitment No. 40 states that maintaining qualification through the extended license renewal period requires that existing EQ evaluations be re-evaluated prior to the period of extended operation.

Issue:

In the LRA, Commitment No. 40 is inconsistent with license renewal commitments for existing programs in that the existing EQ program is considered a TLAA and an AMP but is not credited for license renewal in the applicant's commitment and is shown implemented prior to the period of extended operation.

Request:

Discuss why license renewal Commitment No. 40 does not first reference the existing EQ program as an ongoing program, in addition to performing the re-evaluations of the existing EQ calculations prior to the period of extended operation.

RAI B3.3-1

Background:

GALL Report (NUREG-1801), Section X.S1, "Concrete Containment Tendon Prestress," states that IN 99-10 provides guidance for constructing the trend line. However, PVNGS Program B3.3, Element 5 states that the Concrete Containment Tendon Prestress Program documents will be enhanced to require a regression analysis for each tendon group after every surveillance. The updated documents will also describe the joint regression analysis methods used to construct the lift-off trend lines, including the use of individual tendon data in accordance with IN 99-10 Attachment 3.

Issue:

PVNGS performed tendon surveillance for Units 1, 2, and 3 during 2008, 2006, and 2002, respectively. However, according to PVNGS AMP B3.3, Element 5, the Containment Tendon Prestress Program documents has not been revised until now.

Request:

Please provide the status and conclusions of the regression analysis preformed in accordance with IN 99-10.

RAI 4.4-1

Background:

NUREG-1800, "Generic Aging Lessons Learned (GALL) Report," AMP X.E.1, "Environmental Qualification of Electric Components," and NUREG-1801, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," Table 4.4.2, "Examples of Final Safety Analysis Report Supplement for Environmental Qualification of Electrical Equipment Time-Limited Aging Analysis Evaluation," include re-analysis attributes for an EQ program implemented in accordance with 10 CFR 54.21(c)(1)(iii). The PVNGS LRA, Section 4.4, "Environmental Qualification of Electric Equipment," states that the aging management program to be applied to EQ electrical equipment will be implemented in accordance with 10 CFR 54.21(c)(1)(iii) and includes re-analysis attributes consistent with NUREG-1800 and NUREG-1801.

Issue:

Although LRA, Section 4.4, includes the NUREG-1801 re-analysis attributes, Appendix A, "Updated Final Safety Analysis Report Supplement," Sections A2.2, "Environmental Qualification of Electrical Components," and A3.3, "Environmental Qualification of Electrical Components," do not. If the UFSAR supplement were incorporated as is, the UFSAR described AMP and TLAA for EQ of electrical components would be inconsistent with that described in the LRA, NUREG-1800, and NUREG-1801.

Request:

Revise the description of the EQ of electrical components AMP and TLAA program descriptions in LRA Sections A2.2 and A3.3 to include the re-analysis attributes discussed in LRA Section 4.4, NUREG-1800, and NUREG-1801.