From: Duc Nguyen
To: James Davis; Peter Wen
Date: Fri, Apr 28, 2006 10:23 AM
Subject: Pilgrim questions to be discussed at the audit

Peter, Jim;

Atttached is the questions to be discussed when we get to the site. These questions were based on my review of the AMPs/AMRs information provided in the LRA. Will have additional questions when I review basic documents at the site.

CC: Kathy Weaver; Kenneth Chang

Mail Envelope Properties (4452256E.E54 : 15 : 9304)

Subject: Pilgrim questions to be discussed at the audit
Creation Date Fri, Apr 28, 2006 10:23 AM
From: Duc Nguyen

Created By: DTN1@nrc.gov

Recipients
OWGWPO01.HQGWDO01
JAD (James Davis)

nrc.gov
OWGWPO01.HQGWDO01
KXC2 CC (Kenneth Chang)

nrc.gov
TWGWPO02.HQGWDO01
KDW CC (Kathy Weaver)
PXW (Peter Wen)

Post Office	Route
OWGWPO01.HQGWDO01	
OWGWPO01.HQGWDO01	nrc.gov
TWGWPO02.HQGWDO01	nrc.gov

Files	Size	Date & Time
MESSAGE	648	Friday, April 28, 2006 10:23 AM
Pilgrim LRA_AMP_AMRs_RAI.wpd	25968	Friday, April 28, 2006 10:15 AM

Options

Expiration Date:	None
Priority:	Standard
ReplyRequested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

Questions To be Discussed Regarding

Pilgrim Nuclear Power Station

License Renewal Application

Section 3.6 Electrical and Instrumentation and Controls

Section 4.4 Environmental Qualification of Electrical Components

Aging Management Programs (AMPs) and Aging Management Reviews (AMRs)

AMPs

B.1.11, Environment Qualification (EQ) of Electrical Components Program

B.1.11-1 The results of the environmental qualification of electrical equipment in LRA Section 4.4. indicate that the aging effects of the EQ of electrical equipment identified in the TLAA will be managed during the extended period of operation under 10 CFR 54.21(c)(1)(iii). However, no information is provided on the attribute of a reanalysis of an aging evaluation to extend the qualification life of electrical equipment identified in the TLAA. The important attributes of a reanalysis are the analytical methods, the data collection and reduction methods, the underlying assumptions, the acceptance criteria, and corrective actions. Provide detail description on the important attributes of reanalysis of an aging evaluation of electrical equipment identified in the TLAA in the LRA or plant's basis document (under program description) to extend the qualification under 10 CFR 50.49(e).

B 1.11-2 PNPS B.1.11 under operating experience, you have stated that the overall effectiveness of the EQ of electric components program is demonstrated by the excellent operating experience for systems, structures, and components in the program. Discuss operating experience of the existing EQ program. Show where an existing program has succeeded and where it has failed in identifying aging degradation in a timely manner.

B.1.18, Metal-Enclosed Bus Inspection

B.1.18-1 PNPS AMP B.1.18, under Detection of Aging Affects, you have states that PNPS takes an exception to GALL XI.E4 by visual inspection of metal enclosed bus (MEB) bolted connections every 10 years. GALL XI.E4 under the same element states that as an alternate to thermography or measuring connection resistance of bolted connections, for the accessible bolted connections <u>that are covered with heat shrink tape, sleeving, insulated boots, etc</u>. (emphasis added), the applicant may use visual inspection of insulation material to detect surface anomalies, such as discoloration, cracking, chipping or surface contamination. When this alternate visual inspection is used to check bolted connections, the first inspection will be completed before the period of extended operation and every five years thereafter. NUREG-1833, Table IV, Justification for Changes in Aging Management Programs, states that since the visual inspection is less effective than testing, this inspection (visual) is to be performed once every five years

instead of once every 10 years.

a, Are all bolted connections covered with heat shrink tape, sleeving, or insulated boots? If they are, justify the 10 years frequency vs. the five years as recommended by NUREG-1801.

b. If they are not, justify the visual inspection vs GALL's recommended thermography and/or resistance connections

B.1.18-2 In LRA, Section B.1.18 you have states that the program attribute of the Metal-Enclosed Bus (MEB) Inspection program at PNPS will be consistent with the program attribute described in NUREG-1801, Section XI.E4, Metal Enclosed Bus Aging Management Program with an exception. The exception is to inspect MEB enclosure assemblies in addition to internal surfaces using the MEB Inspection Program. GALL XI.E4 referred structures monitoring program for inspecting the metal enclosure bus assemblies. In addition to inspecting the enclosure assemblies for loss of material due to general corrosion, GALL's structure monitoring program also requires inspecting the enclosure seals for hardening and loss of strength due elastomers degradation. Are these enclosure seals included in the scope of MEB inspection program? What is the acceptance criteria for inspecting the enclosure assemblies?

B.1.18-3 In LRA, Section B.1.18, under Operating Experience, you have stated that the Metal Enclosed Bus Inspection Program at PNPS is a new program for which there is no operating experience. NUREG-1800, Rev. 1, Appendix A, Branch Technical Position RLSB-1 states that an applicant may have to commit to providing operating experience in the future for new program to confirm their effectiveness. Describe how operating experience will be captured to confirm the program effectiveness or to be used to adjust the program as needed.

B.1.19, Non-EQ Inaccessible Medium-Voltage Cable Program

B.1.19-1 In LRA, Section A.2.1.21, you have stated that inspection for water collection in cable manholes and conduit occur at least once every two years. GALL XI.E3 under Detection of Aging Effects recommends that the inspection for water collection should be performed based on actual plant experience with water accumulation in the manhole. However, the inspection frequency should be at least once every two years. Explain how operating experience is considered in manhole inspection frequency. Revise LRA as appropriate to be consistent with GALL's recommendation.

B.1.19-2 In AMP B1.19 under Operating Experience element, you have stated that the Non-EQ Inaccessible Medium-Voltage Cable Program at PNPS is a new program for which there is no operating experience. NUREG-1800, Rev. 1, Appendix A, Branch Technical Position RLSB-1 states that an applicant may have to commit to provide operating experience in the future for new program to confirm their effectiveness. Describe how operating experience is captured to confirm the program effectiveness or to be used to adjust the program as needed.

B.1.20, Non-EQ Instrumentation Circuits Test Review Program

B.1.20-1 In LRA, Section A.2.1.22, you have stated that for neutron flux monitoring

system cables that are disconnected during instrument calibration, testing is performed at least once every 10 years . GALL XI.E2 recommends that the test frequency shall be determined by the applicant based on engineering evaluation, but the test frequency shall be at least once every ten years. Explain how engineering evaluation is considered in the test frequency. Revise LRA as appropriate to be consistent with GALL recommendation.

B.1.20-2 Confirm that the test include both cables and connections.

B.1.20-3 PNPS AMP B1.20 under Operating Experience element states that the Non-EQ Instrumentation Circuit Tests Review Program at PNPS is a new program for which there is no operating experience. Explain how operating experience is captured to confirm the program effectiveness or to be used to adjust the program as needed.

B.1.21, Non-EQ Insulated Cables and Connections Program

B.1.21-1 GALL XI.E1 under program description states that the program described herein is written specifically to address cables and connections at plants whose configuration is such that most (if not all) cables and connections installed in adverse localized environments are accessible. This program, as described, can be thought of as a sampling program. Selected cables and connections from accessible areas (the inspection sample) are inspected and represent, with reasonable assurance, all cables and connections in the adverse localized environment. If an acceptable condition or situation is identified for a cable or connection in the inspection sample, a determination is made as to whether the same condition or situation is applicable to other accessible or inaccessible cables or connections. As such, this program does not apply to plants in which most cables are inaccessible .

a. Provide a ball part percentage of in-scope cable and connections population installed in adverse localized environments that are accessible.

b. In LRA, Section B.1.21 you have stated that the a representative sample of accessible insulated cables and connections within the scope of license renewal will be visually inspected for cable and connection jacket surface anomalies such as embrittlement, discoloration, cracking or surface contamination. Explain the technical basis for cable sampling.

B1.21-2 In LRA, Section B.1.21 under Operating Experience element, you have stated that the Non-EQ Insulated Cables and Connection Program at PNPS is a new program for which there is no operating experience. Describe how operating experience will be captured to confirm the program effectiveness or to be used to adjust the program as needed.

AMRs

3.6.2.2-1 In LRA Table 3.6.2-1 under Cable connections (metallic parts), you have stated that no aging effects and no AMP is required. NUREG-1801, Revision 1, AMP XI.E6, "Electrical Cable Connection not Subject to 10 CFR 50.49 Environmental Qualification Requirements," specifies that connections associated with cables within the scope of license renewal are part of this program, regardless of their associated with active or passive components. Also, refer to pages 107, 256, and 257 of NUREG-1833,

"Technical Bases for Revision to the License Renewal Guidance Documents," for additional information regarding AMP XI.E6. Provide a basis document including an AMP with the ten elements for cable connections or provide a justification for why an AMP is not necessary.

3.6.2.2-2 In LRA Table 3.6.2-1 under high voltage insulator (SBO), you have stated that no aging effects and no AMP is required. You further stated, in Section 3.6.2.2.2 of the LRA, that PNPS is located near the seacoast where salt spray is considered. However, salt spray buildup is a short-term concern based on local weather condition (event driven). Therefore, you have concluded that surface contamination is not an applicable aging mechanism for high voltage insulators at PNPS.

NUREG 1800, Rev. 1, Standard Review Plan for Review of License Renewal Application for Nuclear Power Plant, Section 3.6.2.2.2 identified degradation of high voltage insulator in presence of salt deposits or surface contamination. Various airborne materials such as dust, salt and industrial effluent can contaminate insulator surfaces. A large buildup of contamination enables the conductor voltage to track along the surface more easily and can lead to insulator flash over. Surface contamination can be problem in areas where there are greater concentration of airborne particles such as near facilities that discharge soot or near the sea coast where salt spray is prevalent. Industry operating experience identified the potential of loss of offsite power due to salt deposit to switchyard insulators. On March 17, 1993, Crystal River Unit 3 experienced a loss of the 230 kV switchyard (normal offsite power to safety-related busses) when a light rain caused arcing across salt-laden 230 kV insulators and opened breakers in switchyard. In March 1993, the Brunswick Unit 2 switchyard experienced a flash over of some high-voltage insulators. The incident was attributed to a winter storm in the area. Since 1982, Pilgrim station has also experienced several loss of offsite power events when ocean storms deposited salt on the 345 kV switchyard causing the insulator to arc to ground. In light of these industry and plant operating experiences, provide a basis document with an AMP with the ten attributes to manage the aging effects of insulators or provide a justification of why an AMP is not necessary.

3.6.2.2-3 In LRA, Table 3.6.2-1, under switchyard bus and connections, you have stated that no aging effects requiring management and no AMP is required. NUREG 1800, Rev. 1, Standard Review Plan for Review of License Renewal Application for Nuclear Power Plant, Section 3.6.2.2.3 identifies loss of preload is an aging effect for switchyard bus connections. Torque relaxation for bolted connection is a concern for switchyard bus connections and transmission conductor connections. An electrical connection must be designed to remain tight and maintain good conductivity through a large temperature range. Meeting this design requirement is difficult if the material specified for the bolt and the conductor are different and have different rates of thermal expansion. For example, copper or aluminum bus/conductor materials expand faster than most bolting materials. If thermal stress is added to stresses inherent at assembly, the joint members or fasteners can yield. If plastic deformation occurs during thermal loading (i.e., heatup) when the connection cools, the joint will be loose. EPRI document TR-104213, "Bolted Joint Maintenance & Application Guide," recommends inspection of bolted joints for evidence of overheating, signs of burning or discoloration, and indication of loose bolds. Provide a discussion for why torque relaxation for bolted connections of

switchyard bus is not a concern for PNPS.

3.6.2.2-4 In LRA, Section 3.6.2.2.3, you have stated that PNPS does not utilize transmission conductors in the circuits for recovery of offsite power following an SBO. Describe SBO recovery paths for PNPS. Confirm that no transmission conductors are utilized in the circuits for recovery paths. Support these answers with a main one line diagram.

3.6.2.2-5 10 CFR 54.4 (a)(3) requires, in part, that all systems, structures, and components (SSCs) relied on in safety analyses or plant evaluation to perform a function that demonstrates compliance with the commission's regulations for station black out (10 CFR 50.63) are within the scope of license renewal. What is your alternate ac (AAC) source used to meet SBO requirements? Are all SSCs (including electrical components) associated with AAC sources included in the scope of licensee renewal? If they are not, explain why not. If they are, provide an AMR for long-lived, passive SSCs associated with the AAC sources.