

**From:** James Davis  
**To:** Mark Orr  
**Date:** 06/22/2006 9:01:23 AM  
**Subject:** RE: Additional missing AMPs...

Mark, here it is.

>>> "Orr, Mark" <MPOrr@atlintl.com> 6/21/2006 4:31 PM >>>  
Jim:

You sent us one wrong AMP.

You sent us PNPS AMP Number B.1.31 which is item 3.0.3.1.12 titled "Thermal Aging and Neutron Irradiation Embrittlement ...."

What we needed was PNPS AMP Number B.1.18 which is item 3.0.3.2.12 titled "Metal-Enclosed Bus Inspection"

Sorry I did not catch it earlier -- the item numbers are similar.

Thanks,  
Mark Orr  
ATL Inc.  
Phone: 301-515-6794  
Fax: 301-972-6904

-----Original Message-----

**From:** James Davis [<mailto:JAD@nrc.gov>]  
**Sent:** Tuesday, June 20, 2006 9:48 AM  
**To:** Orr, Mark  
**Subject:** Re: Additional missing AMPs...

The Files are attached.

>>> "Orr, Mark" <MPOrr@atlintl.com> 6/20/2006 9:19 AM >>>  
Peter & Jim:

ATL cannot meet our scheduled delivery for the draft AMP audit report because we have not yet received all AMP's from the NRC reviewers. Please check with the assigned reviewer (identified below) and forward copies of the AMP input as soon as possible.

ATL is missing the following AMP's --

- 3.0.3.1.5 Non-EQ Inaccessible Medium-Voltage Cable Program (AMP B.1.19) - assigned to Duc Nguyen
- 3.0.3.1.6 Non-EQ Instrumentation Circuits Test Review Program (AMP B.1.20) - assigned to Duc Nguyen
- 3.0.3.1.7 Non-EQ Insulated Cables and Connections Program (AMP B.1.21) - assigned to Duc Nguyen
- 3.0.3.1.9 Selective Leaching Program (AMP B.1.27) - assigned to Peter Wen
- 3.0.3.2.12 Metal-Enclosed Bus Inspection Program (AMP B.1.18) - assigned to Duc Nguyen

3.0.3.3.2 Inservice Inspection -- Containment Inservice  
Inspection Program (AMP B.1.16.1) - assigned to Dan Hoang.

Thank you,

Mark Orr  
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Germantown, MD 20874  
Phone: 301-515-6794  
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**Mail Envelope Properties** (449A95C8.6E1 : 22 : 35346)

**Subject:** Re: Pilgrim AMP audit results  
**Creation Date** 06/22/2006 9:06:16 AM  
**From:** James Davis

**Created By:** JAD@nrc.gov

<b>Recipients</b>	<b>Action</b>	<b>Date &amp; Time</b>
atlintl.com AM MPOrr (Mark Orr)	Transferred	06/22/2006 9:06:44

<b>Post Office</b>	<b>Delivered</b>	<b>Route</b>
		atlintl.com

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	2099	06/22/2006 9:06:16 AM

**Options**

**Auto Delete:** No  
**Expiration Date:** None  
**Notify Recipients:** Yes  
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**ReplyRequested:** No  
**Return Notification:** None

**Concealed Subject:** No  
**Security:** Standard

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**Status Tracking:** Delivered & Opened

### 3.0.3.2.12 METAL-ENCLOSED BUS INSPECTION PROGRAM (PNPS AMP B.1.18)

In PNPS LRA, Appendix B, Section B.1.18, the applicant stated that PNPS AMP B.1.18, "Metal-Enclosed Bus Inspection Program," is a new plant program that is consistent with GALL AMP XI.E4, "Metal-Enclosed Bus," with exceptions.

#### 3.0.3.2.12.1 Program Description

The applicant stated, in the PNPS LRA, that this program will manage the effects of aging on non-segregated phase bus which connects the 4.16 kV switchgear (A3 through A6) through visual inspection of enclosure assemblies and interior portions of the bus. This inspection will also verify the absence of water or debris.

The program will be initiated prior to the period of extended operation.

#### 3.0.3.2.12.2 Consistency with the GALL Report

In the PNPS LRA, the applicant stated that PNPS AMP B.1.18 is consistent with GALL AMP XI.E4, with exceptions.

The project team interviewed the applicant's technical staff and reviewed, in whole or in part, the documents listed in Attachment 5 of this audit and review report for PNPS AMP B.1.18, including LRPD-02, Revision 1, Section 3.3, "Metal-Enclosed Bus Inspection Program," which provides an assessment of the AMP elements' consistency with GALL AMP XI.E4. Specifically, the project team reviewed the program elements (see Section 3.0.2.1 of this audit and review report) contained in PNPS AMP B.1.18 and associated bases documents to determine consistency with GALL AMP XI.E4.

Also, the project team reviewed AMRE-01, Rev. 2, Electrical Screening and Aging Management Reviews.

The project team reviewed those portions of the Metal-Enclosed Bus Inspection Program for which the applicant claims consistency with GALL AMP XI.E4 and found that they are consistent with the GALL Report AMP. Furthermore, the project team concludes that the applicant's Metal-Enclosed Bus Inspection Program provides reasonable assurance that aging effects of metal enclosed bus caused by cracked insulation and moisture or debris in the bus enclosure, loosening of bolted connections will be managed to be consistent with CLB during the extended period of operation. The project team found the applicant's Metal-Enclosed Bus Inspection Program acceptable because it conforms to the recommended GALL AMP XI.E4, "Metal-Enclosed Bus," with exceptions as described below.

#### 3.0.3.2.12.3 Exceptions to the GALL Report

The applicant stated, in the PNPS LRA, that the exception to the GALL Report program elements is as follows:

##### Exception 1

Exception: MEB enclosure assemblies will be inspected in addition to internal surfaces.

Affected Elements:

3: Parameters Monitored/Inspected  
4: Detection of Aging Effects

The GALL Report identified the following recommendations for the "Parameters Monitored/Inspected" and "Detection of Aging Effects" program elements associated with the exception taken:

**Parameters Monitored/Inspected:** A sample of accessible bolted connections will be checked for loose connection. Alternatively, bolted connections covered with heat shrink tape, sleeving, insulating boots, etc., may be visually inspected for insulation material surface anomalies. This program provides for the inspection of the internal portion of the MEBs for cracks, corrosion, foreign debris, excessive dust buildup, and evidence of water intrusion. The bus insulation will be inspected for signs of embrittlement, cracking, melting, swelling, or discoloration, which may indicate overheating or aging degradation. The internal bus supports will be inspected for structural integrity and signs of cracks.

**Detection of Aging Effects:** A sample of accessible bolted connections will be checked for loose connection by using thermography or by measuring connection resistance using a low-range ohmmeter. MEB internal surfaces will be visually inspected for aging degradation of insulating material and for foreign debris and excessive dust buildup, and evidence of moisture intrusion. Bus insulation will be visually inspected for signs of embrittlement, cracking, melting, swelling, or discoloration, which may indicate overheating or aging degradation. Internal bus supports will be visually inspected for structural integrity and signs of cracks. This program will be completed before the period of extended operation and every 10 years thereafter provided visual inspection is not used to check bolted connections. A 10-year inspection interval will provide two data points during a 20-year period, which can be used to characterize the degradation rate. This is an adequate period to preclude failures of the MEBs since experience has shown that aging degradation is a slow process.

As an alternative to thermography or measuring connection resistance of bolted connections, for the accessible bolted connections that are covered with heat shrink tape, sleeving, insulating boots, etc., the applicant may use visual inspection of insulation material to detect surface anomalies, such as discoloration, cracking, chipping or surface contamination. When this alternative 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.

The applicant stated in the PNPS LRA, under Exception Note 1, that inspection of MEB enclosure under the Metal-Enclosure Bus Inspection Program assures that effects of aging will be identified prior to loss of intended functions.

GALL (NUREG-1801, Rev. 1, Section VI, Items VI.A-12 and VI-13) refereed structure monitoring program for inspecting the external of MEB for loss of material due to general

corrosion and inspecting the enclosure seals for hardening and loss of strength due to elastomers degradation. In LRA, Section B.1.18, the applicant stated that the program attribute of MEB inspection program would be consistent with the program attribute in NUREG-1801, Section XI.E4 with an exception. The exception is to inspect MEB enclosure assemblies in addition to internal surfaces using the MEB inspection program. The project team asked the applicant if the enclosure seals were included in the scope of MEB inspection program and what was the acceptance criteria for inspecting the external of enclosure assemblies. In a letter dated... (ML...), the applicant responded that the PNPS MEB program will visually inspect the enclosure assemblies for evidence of loss of material and enclosure assembly elastomers will be visually inspected and manually flexed. The applicant will revise LRPD-02 to read as follows:

(Section 3.3.B.6.b - Acceptance Criteria - add after first paragraph)

The acceptance criteria for enclosure assemblies will be no loss of material due to general corrosion. The acceptance criteria for elastomers will be no hardening and loss of strength due to degradation.

The project team found that the applicant's response acceptable because it will inspect external of MEB including seals and the acceptance criteria for the inspecting the components of external of MEB will be provided in the plant's basis document (LRPD). On this basis, the project team found this exception acceptable.

#### Exception 2

Elements: 4: Detection of Aging Effects

Exception: MEB bolted connections will be visually inspected every 10 years, rather than every five years as stated in NUREG-1801.

The GALL Report identified the following recommendation for the "Detection of Aging Effects" program element associated with the exception taken:

**Detection of Aging Effects:** A sample of accessible bolted connections will be checked for loose connection by using thermography or by measuring connection resistance using a low-range ohmmeter. MEB internal surfaces will be visually inspected for aging degradation of insulating material and for foreign debris and excessive dust buildup, and evidence of moisture intrusion. Bus insulation will be visually inspected for signs of embrittlement, cracking, melting, swelling, or discoloration, which may indicate overheating or aging degradation. Internal bus supports will be visually inspected for structural integrity and signs of cracks. This program will be completed before the period of extended operation and every 10 years thereafter provided visual inspection is not used to check bolted connections. A 10-year inspection interval will provide two data points during a 20-year period, which can be used to characterize the degradation rate. This is an adequate period to preclude failures of the MEBs since

experience has shown that aging degradation is a slow process.

As an alternative to thermography or measuring connection resistance of bolted connections, for the accessible bolted connections that are covered with heat shrink tape, sleeving, insulating boots, etc., the applicant may use visual inspection of insulation material to detect surface anomalies, such as discoloration, cracking, chipping or surface contamination. When this alternative 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.

The applicant stated, in the PNPS LRA, under Foot Note 2 that in NUREG-1801 for the other inspections, a 10 year inspection interval will provide two data points during a 20-year period, which can be used to characterize the degradation rate. This is an adequate period to preclude failures of the MEBs since experience has shown that aging degradation is slow process.

GALL AMP XI.E4 states that as an alternate to thermography or measuring connection resistance of bolted connections, for the accessible bolted connections that are covered with heat shrink tape, sleeving, insulated boots, etc; 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. Since the visual inspection is less effective than testing, this inspection (visual) is to be performed once every five years instead of once every ten years. In the LRA, the applicant stated that visual inspection of MEB bolted connections will occur every ten years. The project team asked the applicant if all bolted connections are covered with heat shrink tape, sleeving, or insulated boots and requested the applicant to justify the 10 years inspection frequency vs. the five years as recommended by GALL XI.E4. In a letter dated... (ML....), the applicant responded that sine MEB bolted connections are covered with heat shrink tape or insulating boots per manufacturer's recommendations, a sample of accessible bolted connections will be visually inspected for insulation material surface anomalies. Internal portions of the MEBs will be inspected for cracks, corrosion, foreign debris, excessive bust buildup, and evidence of water intrusion. Bus insulation will be inspected for signs of embrittlement, cracking, melting, swelling, or discoloration, which may indicate overheating or aging degradation. Internal bus supports will be inspected for structural integrity and signs of cracking. An inspection will occur before the initial 40-year license term and every 5-years thereafter. If degradation is found in the MEB materials, an engineering evaluation will be performed when the inspection acceptance criteria are not met in order to ensure that the intended functions of the MEB can be maintained consistent with the current license basis. This evaluation is performed in accordance with the Entergy correction process per procedure EN-LI-102. This procedure provides the stated elements to consider including the extend of the concern, the potential root causes for not meeting the test acceptance criteria, the corrective action required, and likelihood of recurrence. This engineering evaluation will determine the frequency of the next inspection, which will not exceed 5 years. In addition, the applicant also responded that it will revise LRA Appendix B.2.1.20 to "5 years". Revise LRA Appendix B.1.18 to remove the exception to 5 years. On this basis, the project team found the applicant response acceptable.

#### 3.0.3.2.12.4 Enhancements

None.

#### 3.0.3.2.12.5 Operating Experience

The applicant stated, in the PNPS LRA, that the Metal-Enclosed Bus Inspection Program at PNPS is a new program for which there is no operating experience.

GALL XI.E4 indicates that operating experience has shown that degradation of MEB within the scope of XI.E4 may exist. The project team requested the applicant to provide industrial and plant operating experience associated with this program. In a letter dated... (ML...), the applicant responded that...

The project team reviewed the operating experience provided in the PNPS LRA and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

On the basis of its review of the above industry and plant-specific operating experience and discussions with the applicant's technical staff, the project team concluded that the applicant's Metal-Enclosed Bus Inspection Program will adequately manage the aging effects that are identified in the PNPS LRA for which this AMP is credited.

#### 3.0.3.2.12.6 UFSAR Supplement

The applicant provided its UFSAR Supplement for the Metal-Enclosed Bus Inspection Program in PNPS LRA, Appendix A, Section A.2.1.20, which states that under the Metal-Enclosed Bus Inspection Program, internal portions of the nonsegregated phase bus which connects the 4.16kV switchgear (A3 through A6) are inspected for cracks, corrosion, foreign debris, excessive dust buildup, and evidence of water intrusion. Bus insulation is inspected for signs of embrittlement, cracking, melting, swelling, or discoloration, which may indicate overheating or aging degradation. Internal bus supports are inspected for structural integrity and signs of cracks. Since bolted connections are covered with heat shrink tape or insulating boots per manufacturer's recommendations, a sample of accessible bolted connections is visually inspected for insulation material surface anomalies. Enclosure assemblies are visually inspected for evidence of loss of material and, where applicable, enclosure assembly elastomers are visually inspected and manually flexed to manage cracking and change in material properties. These inspections are performed at least once every 10 years.

As described above, the applicant will revise UFSAR, Appendix A.2.1.20 to "5 years". The project team reviewed the revised UFSAR Supplement for PNPS AMP B.1.18, found that it was consistent with the GALL Report, and determined that it provides an adequate summary description of the program, as identified in the SRP-LR FSAR Supplement table and as required by 10 CFR 54.21(d).

#### 3.0.3.2.12.7 Conclusion

On the basis of its review and audit of the applicant's program, the project team found that those program elements for which the applicant claims consistency with the GALL Report, are consistent with the GALL Report. In addition, the project team has reviewed the exception and the associated justifications and determined that the AMP, with the exception, is adequate to manage the aging effects for which it is credited. The project team found that the applicant has

demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained for the period of extended operation, as required by 10 CFR 54.21(a)(3). The project team also reviewed the UFSAR Supplement for this AMP and found that it provides an adequate summary description of the program, as required by 10 CFR 54.21(d).