

ANO-2 SER FINAL WITH OPEN AND CONFIRMATORY ITEMS

3.6 Aging Management of Electrical and Instrumentation and Controls

This section of the SER documents the staff's review of the applicant's AMR results for the electrical and instrumentation and controls components associated with the following commodity groups:

- insulated cables and connections
- phase bus
- switchyard bus
- high-voltage insulators

3.6.1 Summary of Technical Information in the Application

In Section 3.6 of the LRA, the applicant provided the results of the aging management review of the electrical and instrumentation and controls components listed in Table 2.5-1 of the LRA. The applicant also listed the materials, environments, aging effects requiring management, and aging management programs associated with each commodity group.

In Table 3.6.1, "Summary of the Aging Management Programs for Electrical and I&C Components Evaluated in Chapter VI of NUREG-1801," of the LRA, the applicant provided a summary comparison of its AMRs with the AMRs evaluated in the GALL Report for the electrical and instrumentation and control components and component types. In Section 3.6.2.2 of the LRA, the applicant provided information concerning Table 3.6.1 components for which further evaluation is recommended by the GALL Report.

3.6.2 Staff Evaluation

The staff reviewed Section 3.6 of the LRA to understand the applicant's review process and to determine whether the applicant provided sufficient information to demonstrate that the effects of aging for the electrical and instrumentation and control components that are within the scope of license renewal and subject to an AMR will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

The staff performed an audit to confirm the applicant's claim that certain identified AMRs are consistent with the staff-approved AMRs in the GALL Report. The staff did not repeat its review of the matters described in the GALL Report. However, the staff did verify that the material presented in the LRA was applicable and that the applicant had identified the appropriate GALL AMRs. The staff's audit findings are summarized in Section 3.6.2.1 of this SER.

The staff also audited those AMRs that were consistent with the GALL Report and for which further evaluation is recommended. The staff verified that the applicant's further evaluations were consistent with the acceptance criteria in Section 3.6.3.2 of NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." The staff's audit findings are summarized in Section 3.6.2.2 of this SER.

The staff conducted a technical review of the remaining AMRs that were not consistent with the GALL Report. The review included evaluating whether all plausible aging effects were identified

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and whether the aging effects listed were appropriate for the combination of materials and environments specified. The staff's review findings are documented in the Section 3.6.2.3 of this SER.

3.6.2.1 Aging Management Evaluations that are Consistent with the GALL Report, for Which No Further Evaluation is Required

Summary of Technical Information in the Application

In Section 3.6.2.1 of the LRA, the applicant identified the materials, environments, and aging effects requiring management. The applicant identified the following programs that manage the aging effects related to the electrical and instrumentation and control components:

- Boric Acid Corrosion Prevention Program
- Non-EQ Inaccessible Medium-voltage Cable Program
- Non-EQ Insulated Cables and Connections Program

Staff Evaluation

In Table 3.6.2-1 of the LRA, the applicant provided a summary of AMRs for the electrical and instrumentation and control components and identified which AMRs it considered to be consistent with the GALL Report. The applicant provided a note for each AMR line item. The notes described how the information in the Tables aligns with the information in the GALL Report. The staff audited those AMRs with notes A through E, which indicated the AMR was consistent with the GALL Report.

Note A indicated that the AMR line item is consistent with the GALL Report for component, material, environment, and aging effect. In addition, the AMP is consistent with the AMP identified in the GALL Report. The staff audited these line items to verify consistency with the GALL Report and the validity of the AMR for the site-specific conditions.

Note B indicated that the AMR line item is consistent with the GALL Report for component, material, environment, and aging effect. In addition, the AMP takes some exceptions to the AMP identified in the GALL Report. The staff audited these line items to verify consistency with the GALL Report. The staff verified that the identified exceptions to the GALL AMPs had been reviewed and accepted by the staff. The staff also determined whether the AMP identified by the applicant was consistent with the AMP identified in the GALL Report and whether the AMR was valid for the site-specific conditions.

Note C indicated that the component for the AMR line item is different, but consistent with the GALL Report for material, environment, and aging effect. In addition, the AMP is consistent with the AMP identified by the GALL Report. This note indicates that the applicant was unable to find a listing of some system components in the GALL Report. However, the applicant identified a different component in the GALL Report that had the same material, environment, aging effect, and AMP as the component that was under review. The staff audited these line items to verify consistency with the GALL Report. The staff also determined whether the AMR line item of the different component was applicable to the component under review and whether the AMR was valid for the site-specific conditions.

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Note D indicated that the component for the AMR line item is different, but consistent with the GALL Report for material, environment, and aging effect. In addition, the AMP takes some exceptions to the AMP identified in the GALL Report. The staff audited these line items to verify consistency with the GALL Report. The staff verified whether the AMR line item of the different component was applicable to the component under review. The staff verified whether the identified exceptions to the GALL AMPs had been reviewed and accepted by the staff. The staff also determined whether the AMP identified by the applicant was consistent with the AMP identified in the GALL Report and whether the AMR was valid for the site-specific conditions.

Note E indicated that the AMR line item is consistent with the GALL Report for material, environment, and aging effect, but a different aging management program is credited. The staff audited these line items to verify consistency with the GALL Report. The staff also determined whether the identified AMP would manage the aging effect consistent with the AMP identified by the GALL Report and whether the AMR was valid for the site-specific conditions.

The staff conducted an audit and review of the information provided in the LRA and program bases documents, which are available at the applicant's engineering office. On the basis of its audit and review, the staff finds that the AMR results, which the applicant claimed to be consistent with the GALL Report, are consistent with the AMRs in the GALL Report. Therefore, the staff finds that the applicable aging effects were identified and are appropriate for the combination of materials and environments listed.

Staff RAIs Pertaining to Recent Operating Experience and Emerging Issues

Because the GALL Report and SRP-LR were issued in July 2001, these documents do not reflect the most current recommendations for managing certain aging effects that have been the subject of recent operating experience or the topic of an emerging issue. As a result, the staff issued RAIs to determine how the applicant proposed to address these items for license renewal. The applicant's responses to these RAIs, and the staff's evaluations of the responses, are documented as follows.

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Conclusion

The staff has verified the applicant's claim of consistency with GALL Report. The staff also has reviewed information pertaining to the applicant's consideration of recent operating experience and proposals for managing associated aging effects. On the basis of its review, the staff finds that the AMR results, which the applicant claimed to be consistent with the GALL Report, are consistent with the AMRs in the GALL Report. Therefore, the staff finds that the applicant has demonstrated that the effects of aging for these components will be adequately managed so that their intended function(s) will be maintained consistent with the current licensing basis for the period of extended operation, as required by 10 CFR 54.21(a)(3).

3.6.2.2 Aging Management Evaluations that are Consistent with the GALL Report, for Which Further Evaluation is Recommended

Summary of Technical Information in the Application

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In Section 3.6.2.2 of the LRA, the applicant provided further evaluation of aging management as recommended by the GALL Report for electrical and instrumentation and control components. The applicant provided information concerning how it will manage the following aging effects:

- electrical equipment subject to environmental qualification
- quality assurance for aging management of non-safety-related components

Staff Evaluation

For component groups evaluated in the GALL Report for which the applicant has claimed consistency with the GALL Report, and for which the GALL Report recommends further evaluation, the staff reviewed the applicant's evaluation to determine whether it adequately addressed the issues that were further evaluated. In addition, the staff reviewed the applicant's further evaluations against the criteria contained in Section 3.6.3.2 of the SRP-LR. Details of the staff's audit and review are documented in the audit and review report.

Conclusion

On the basis of its review, the staff finds that the applicant's further evaluations conducted in accordance with the GALL Report are consistent with the acceptance criteria of the SRP-LR. Since the applicant's AMR results are otherwise consistent with the GALL Report, the staff finds that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the current licensing basis for the period of extended operation, as required by 10 CFR 54.21(a)(3).

3.6.2.3 AMR Results that are Not Consistent with the GALL Report or Not Addressed in the GALL Report

Summary of Technical Information in the Application

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Staff Evaluation

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Conclusion

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3.6.3 Conclusion

The staff concluded that the applicant provided sufficient information to demonstrate that the effects of aging for the electrical and instrumentation and controls components that are within the scope of license renewal and subject to an AMR will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).