

Oconee SLRA Audit

Breakout Session Electrical Questions

Long Term Operations and Modernization Branch (ELTB)

1. TRP 053.1 (J. Cintron)

GALL-SLR AMP XI.E3A

SLRA AMP B2.1.38, Electrical Insulation for Inaccessible Medium-Voltage Power Cable Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

The staff reviewed the periodic actions taken by the applicant such as inspecting for water accumulation in cable manholes, vaults, conduits, and removing water as needed for Inaccessible Medium-Voltage Power Cable. However, periodic actions taken may not be sufficient due to the inability to remove accumulated water trapped in the raceways.

Is the applicant taking additional actions to prevent water accumulation in the raceway due to settling or cracking due to soil settling over a long period of time, manholes and cable trench covers not being watertight, and potential wetting or submergence even when duct banks are sloped with the intention to minimize water accumulation?

2. TRP 053.2 (J. Cintron)

GALL-SLR AMP XI.E3B

SLRA AMP B2.1.39 Electrical Insulation for Inaccessible Instrument and Control Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

The staff reviewed the periodic actions taken by the applicant such as inspecting for water accumulation in cable manholes, vaults, conduits, and removing water as needed. However, periodic actions may not be sufficient due to the inability to remove accumulated water trapped in the raceways.

Is the applicant taking additional actions to prevent water accumulation in the raceways due to settling or cracking due to soil settling over a long period of time, manholes and cable trench covers not being watertight, and potential wetting or submergence even when duct banks are sloped with the intention to minimize water accumulation?

3. TRP 054 (Duc Nguyen)

GALL-SLR AMP XI.E4

SLRA AMP B2.1.41, Metal Enclosed Bus

The staff reviewed SLR-ONS-AMPR-XI.E4. Under "Corrective Actions," the applicant states that results that do not meet acceptance criteria are addressed as condition adverse to quality or significant condition adverse to quality in the Duke Energy Corrective Action Program. The Corrective Action Program is implemented in accordance with the requirements of 10 CFR 50, Appendix B, Criterion XVI and Topical Report DUKE-QAPD-001-A." The corresponding program element in SLR-GALL XI.E4 states, in part, that "corrective action are taken and an

engineering evaluation is performed when the acceptance criteria are not met. Corrective actions may include, but are not limited, to cleaning, drying, increase inspection frequency, replacement, or repair of the affected MEB components. If an unacceptable condition or situation is identified, a determination is made as to whether the same condition or situation is applicable to MEB bolted connections not inspected or tested. Further, when acceptance criteria are not met, a determination is made as to whether the surveillance, inspection, or test, including frequency needed to be modified." It is not clear that the applicant's program element will specifically require a determination as to whether the same condition or situation is applicable to MEB bolted connections not inspected or test or whether the surveillance, inspection, or test, including frequency intervals, needs to be modified.

Explain how this program element is consist with those in GALL-SLR XI.E4.

4. TRP 063 (Matt McConnell)

GALL-SLR AMP X.E1

SLRA AMP B3.3, "Environmental Qualification of Electric Equipment

In Section 4.4 of the SLRA the applicant stated the following:

"Any changes to material activation energy values included as part of a reanalysis are justified by the applicant on a component-specific basis." In Sections A3.3 and B3.3 of the SLRA the applicant further stated:

"Changes to material activation energy values as part of the reanalysis are justified."

Clarify whether this revised document is reviewed to verify that justification/basis for activation energies remains valid for EQ components.

Has the applicant used EPRI Report NP-1558, "A Review of Aging Theory and Technology," dated September 1980 to obtain justification/basis for activation energies for the purpose of extending the qualified life of environmentally qualified equipment? If so, EPRI recently updated this report (July 2020) due to issues/concerns with lack of or expired technical references for certain activation energies (it's believed that between 20-30% of activation energies have been removed from the database as a result).

5. TRP 058 (Duc Nguyen)

SLRA Section 3.6.2.2.2

Section 3.6.2.2.2 of NUREG-2192 (GALL-SLR) states that reduced insulation resistance due to age degradation of cable bus caused by intrusion of moisture, dust, industrial pollution, rain, ice, photolysis (for ultraviolet sensitive material only), ohmic heating and loss of strength of support structures, covers or louvers of cable bus arrangements due to general corrosion or exposure to air outdoor could occur in cable bus assemblies. Cable bus may omit the top cover or use a louvered top cover and enclosure. Both the cable bus and enclosure are not sealed against intrusion of dust, industrial pollution, moisture, rain, and ice and therefore may introduce debris into the internal cable bus assembly. In SLRA Section 3.6.2.2.2, the applicant states that aging management of the cables is implemented under the Electrical Insulation of Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirement Aging Management Program (B2.1.36), whereas aging management of the cable tray and associated

hardware is accomplished using Structures Monitoring program (B2.1.33). GALL-SLR Report AMP XI.E1 calls for visual inspection of accessible insulated cables and connections subject to an adverse localized environment (high heat, radiation, or moisture) which may not be applicable to cable bus due to inaccessibility or applicability of aging mechanisms and effects.

Explain how the aging management program B2.1.36 is applicable to the cable bus (in term of accessibility or applicability of aging mechanism and effects) or address each aging mechanism and effect identified in GALL-SLR and explain why these aging effects are not significant and no aging management program is required.