AUDIT WORKSHEET
GALL REPORT AMP

PLANT: _____

LRA AMP: _____ **REVIEWER:** _____

GALL AMP: **XI.E1, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements** **DATE:** _____

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
Program Description	A. In most areas within a nuclear power plant, the actual ambient environments (e.g., temperature, radiation, or moisture) are less severe than the plant design environment. However, in a limited number of localized areas, the actual environments may be more severe than the plant design environment for those areas. Conductor insulation materials used in cables and connections may degrade more rapidly than expected in these adverse localized environments. An adverse localized environment is a condition in a limited plant area that is significantly more severe than the specified service environment for the cable. An adverse variation in environment is significant if it could appreciably increase the rate of aging of a component or have an immediate adverse effect on operability. The purpose of the aging management program described herein is to provide reasonable assurance that the intended functions of electrical cables and connections that are not subject to the environmental qualification requirements of 10 CFR 50.49 and are exposed to adverse localized environments caused by heat, radiation, or moisture will be maintained consistent with the current licensing basis through the period of extended operation. This program considers the technical information and guidance provided in NUREG/CR-5643, IEEE Std. P1205, SAND96-0344, and EPRI TR-109619.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
“	B. The program described herein is written specifically to	Consistent with GALL AMP: ☐ Yes ☐No

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
	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 environments. If an unacceptable 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.	Document(s) used to confirm Criteria: Comment:
“	C. As stated in NUREG/CR-5643, "The major concern with cables is the performance of aged cable when it is exposed to accident conditions." The statement of considerations for the final license renewal rule (60 Fed. Reg. 22477) states, "The major concern is that failures of deteriorated cable systems (cables, connections, and penetrations) might be induced during accident conditions." Since they are not subject to the environmental qualification requirements of 10 CFR 50.49, the electrical cables and connections covered by this aging management program are either not exposed to harsh accident conditions or are not required to remain functional during or following an accident to which they are exposed.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment
1. Scope of Program	A. This inspection program applies to accessible electrical cables and connections within the scope of license renewal that are installed in adverse localized environments caused by heat or radiation in the presence of oxygen.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
2. Preventive Actions	A. This is an inspection program and no actions are taken as part of this program to prevent or mitigate aging degradation.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria:

Program Element	Auditable GALL Criteria	Documentation of Audit Finding
		Comment:
3. Parameters Monitored/ Inspected	A. A representative sample of accessible electrical cables and connections installed in adverse localized environments are visually inspected for cable and connection jacket surface anomalies. Technical basis for the sample selected is to be provided.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
4. Detection of Aging Effects	A. Conductor insulation aging degradation from heat, radiation, or moisture in the presence of oxygen causes cable and connection jacket surface anomalies. A representative sample of accessible electrical cables and connections installed in adverse localized environments are visually inspected for cable and connection jacket surface anomalies, such as embrittlement, discoloration, cracking, or surface contamination. Accessible electrical cables and connections installed in adverse localized environments are visually inspected at least once every 10 years. This is an adequate period to preclude failures of the conductor insulation since experience has shown that aging degradation is a slow process. A 10-year inspection interval will provide two data points during a 20-year period, which can be used to characterize the degradation rate. The first inspection for license renewal is to be completed before the period of extended operation.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
5. Monitoring and Trending	A. Trending actions are not included as part of this program because the ability to trend inspection results is limited. However, trending would provide additional information on the rate of degradation.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:

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6. Acceptance Criteria	A. The accessible cables and connections are to be free from unacceptable, visual indications of surface anomalies, which suggest that conductor insulation or connection degradation exists. An unacceptable indication is defined as a noted condition or situation that, if left unmanaged, could lead to a loss of the intended function.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
7. Corrective Actions	A. All unacceptable visual indications of cable and connection jacket surface anomalies are subject to an engineering evaluation. Such an evaluation is to consider the age and operating environment of the component, as well as the severity of the anomaly and whether such an anomaly has previously been correlated to degradation of conductor insulation or connections. Corrective actions may include, but are not limited to, testing, shielding or otherwise changing the environment, or relocation or replacement of the affected cable or connection.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
“	B. When an unacceptable condition or situation is identified, a determination is made as to whether the same condition or situation is applicable to other accessible or inaccessible cables or connections. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
8. Confirmation Process	A. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the confirmation process.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
9. Administrative Controls	A. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the administrative controls.	Consistent with GALL AMP: ☐ Yes ☐No Document(s) used to confirm Criteria: Comment:
10. Operating	A. Operating experience has shown that adverse localized	Consistent with GALL AMP: ☐ Yes ☐No

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Experience	environments caused by heat or radiation for electrical cables and connections may exist next to or above (within three feet of) steam generators, pressurizers or hot process pipes, such as feedwater lines. These adverse localized environments have been found to cause degradation of the insulating materials on electrical cables and connections that is visually observable, such as color changes or surface cracking. These visual indications can be used as indicators of degradation.	Document(s) used to confirm Criteria: Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
…				

ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
…				

DOCUMENT REVIEWED DURING AUDIT

Document Number	Identifier (number)	Title	Revision and/or Date
1.			
2.			
3.			
4.			
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