

Activity: Environmental Qualification

1.0 **Purpose:** To provide a guideline for the performance of quality surveillances to assure implementation of the Environmental Qualification (EQ) program.

NOTE: Implementation of the EQ program can be accomplished through work requests, maintenance requests, preventive maintenance instructions, surveillance instructions, and other instructions.

2.0 **Scope:** This guideline has been developed for the review and evaluation of the EQ programs which address and implement the requirements and practices delineated in the following references.

3.0 **References:**

- 3.1 10CFR50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants"
- 3.2 Regulatory Guide 1.89, Revision 1, "Environmental Qualification of Certain Electrical Equipment Important to Safety for Nuclear Power Plants"
- 3.3 Regulatory Guide 1.97, Revision 2, "Instrumentation of Light Water Cooled Nuclear Power Plants to Assess Plant Environs Conditions During and Following an Accident"
- 3.4 NUREG 0588, Revision 1, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment"
- 3.5 NRC IE Bulletin 79-01B, "Environmental Qualification of Class 1E Equipment," and

Supplemental Notices Nos. 1, 2, and 3

- 3.6 NRC Notice 85-39, "Auditability of Electrical Equipment Qualification or Records at Licenses' Facilities"
- 3.7 NRC memorandum and order CLI 80-21
- 3.8 NRC IE Circular No. 80-10, "Failure to Maintain Environmental Qualification of Equipment"
- 3.9 INPO Good Practice MA-307, Preventive Maintenance
- 3.10 INPO Good Practice MA-310, Maintenance History Program
- 3.11 INPO Good Practice 85-001, Performance Objectives and Criteria for Operating and Near Term Operating License Plants
- 3.12 INPO Good Practice 85-013, Plant Modification Control Program

4.0 Guidelines:

4.1 In preparation for and during the conduct of this surveillance:

- E Obtain and review implementing procedures, instructions and drawings governing this activity.
- E Prepare a guide or checklist using the selected items from this guideline.
- E Review past surveys, audits, surveillances and other evaluations/ assessments.
- E Ensure that checklists include, where applicable, actual observations of performance, general plant conditions, radiological work practices, housekeeping, work document controls and use, and safety practices.

NOTE: Refer to Guideline A.1, "General Quality Surveillance Guidance," for specific details on the attributes listed above.

4.2 Ensure that the following subjects are considered:

- A. 10CFR50.49 list of controls.
- B. Design changes, modifications, maintenance, surveillance, procurement, material control, qualification, training, and trending activity controls related to 10CFR50.49 devices.

4.3 Using an environmental data drawing index or equivalent, identify the areas of the plant designated as having design basis accident/ event (DBA/DBE) "harsh environments."

4.4 Using the maintenance plan and schedule, or other schedules or inputs, select one or more of the areas identified above using the following criteria:

- A. Preventive or corrective maintenance is currently taking place (or planned), or

- B. Design changes or modifications are currently being implemented (or planned), or
 - C. Surveillance testing and/or instrument calibrations are currently being performed (or planned).
- 4.5 If possible, and prior to the performance of the scheduled work, review the work package(s), including procedures and instructions, related to the areas identified above and verify that all 10CFR50.49 devices have been identified.
- 4.6 For documents (e.g., work packages) containing 10CFR50.49 devices, check for the following:
- A. Verify that provisions have been included for updating the 10CFR50.49 list and other information sources.

NOTE: 10CFR50.49 "whole devices" qualified to NUREG 0588 Category II are to be replaced by NUREG 0588 Category I devices when replacement is necessary unless there exists appropriate justification to the contrary (Regulatory Guide 1.89, Revision 1).

- B. Select and review work packages, paying specific attention to areas that may be deficient, as determined by qualified surveillance personnel.
- C. For modifications involving 10CFR50.49 devices, verify that an evaluation for impact on 10CFR50.49 equipment has been made and is a part of the design change package.
- D. Verify that the design change package clearly identifies any environmental qualification-related installation requirements, and that these requirements have

been incorporated into the work plan.

- E. Work plans should contain sufficient detail to ensure that environmental qualification of the equipment is not invalidated during installation (Example: Certain solenoid valves must be mounted vertically and upright).

4.7 Observe maintenance activities and check for the following:

- A. Verify that only qualified replacement parts and materials are issued for work on 10CFR50.49 equipment.
- B. Verify that craftsmen are familiar with the qualified maintenance program or equivalent (equipment within the scope of 10CFR50.49, special requirements, *whole device* and piece part replacement applicability and 10CFR50.49 identification).

Note: Personnel performing specific tasks should have received training associated with those tasks.

- C. For 10CFR50.49 devices, verify that the craftsman or technicians perform a visual inspection of the equipment for signs of degradation and that this visual inspection is properly documented. Documentation should include the cause of the problem, if any, such as:

1. Wrong parts of parts.
2. Normal or abnormal wear.
3. Lubrication problem.
4. Loose mechanical parts.

5. Material defects.
6. Material degradation.
7. Excess vibration.
8. Dirt, contamination.
9. Burned.
10. Shorted.
11. Grounded.
12. Improper repair.

Note: If degradation is found, and evaluation must be performed or the degradation corrected prior to declaring the equipment operable.

- 4.8 Observe modification activities and check for the following:
 - A. Verify only qualified devices are issued for installation as 10CFR50.49 equipment.
 - B. Ensure that the cognizant person is notified following completion of field work on 10CFR50.49 equipment for EQ list and binder updates.
- 4.9 Select and review a sampling for devices listed in the plant Q-list.
- 4.10 Evaluate the implementation of EQ requirements:
 - A. For the items selected, conduct a walkdown of the control room, alternate shutdown panel, or other; determine where the instruments are used as a primary source of information , or as a backup (should be clearly marked).
 - B. Verify that all instruments designated as primary and whose sensory devices are located within “harsh zones” are listed in the plant’s EQ list.

Note: Reg. Guide 1.97, Rev. 2 – Qualification applies to the complete instrumentation channel from sensor to display where the display is a direct indicating meter or recording device. If the instrumentation channel signal is to be used in a computer-based display, recording or diagnostic program, qualification applies from the sensor up to and including the channel isolation device.

- 4.11 Ensure that maintenance has performed reviews of the maintenance activities performed on 10CFR50.49 devices for evidence of continuing degradation.

5.0 Other Guidelines for Consideration:

- 5.1 A.1, "General Quality Surveillance Guidance"
- 5.2 F.5, "Design Controls"