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REVIEWING EFFECTIVENES OF EQ PROGRAMMES

Module 7



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- Role of the utility/ NPP licensee: responsible for the overall plant specific EQ programme and all related activities regardless of who is responsible for performing them.
- Role of the regulatory body: to verify that the licensee's EQ programme meets the applicable regulatory requirements and standards

Presentation

Session 7.1:

Periodic audits and reviews

Session 7.2:

Ongoing/routine surveillance and inspections

Periodic audits and reviews of EQ programme

Session 7.1



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Two kinds of periodic audit/review of a plant specific EQ programme

- Comprehensive audits/reviews covering all aspects and activities of a plant EQ programme - usually performed when the programme is first established, as a part of a periodic safety review of an NPP (typical period: ten years) or a licence renewal review (e.g. as planned in the USA)
- Focused audits/reviews covering selected aspects and activities of an EQ programme - conducted more frequently and often in response to incidents

Elements of review: Licensee EQ programme activities

1. EQ programme document describing key programme elements, responsibilities and procedures
2. Methods and criteria utilized in the EQ programme to reflect required licensing and design basis
3. Availability of an up to date EQ master list

4. Availability of qualification documentation in an auditable and traceable form providing evidence of qualification for each item on the EQ master list
5. Traceability of EQ supporting documentation
6. Verification through physical inspection that:
 - (a) installed equipment matches the qualified equipment
 - (b) the equipment is installed correctly
 - (c) the equipment is in good condition

7. Measures required to preserve qualification during equipment's installed life
8. Qualification of personnel to perform EQ related job functions
9. A surveillance programme to ascertain that ageing degradation and functional capability of the equipment remain acceptable

10. A programme to analyse failures of qualified equipment and to implement appropriate corrective actions
11. A feedback programme to gather and review information relevant to the status of qualified equipment
12. The above elements reflect current design information, including any recent plant and equipment modifications

Elements of review: Activities of suppliers of equipment qualification services

1. Project and organizational documents describing NPP-specific EQ services
2. Control of project input documentation (e.g. EQ specifications, vendor qualification test reports, drawings, correspondence)
3. Procedure for the review and approval of qualification documents, including:
 - Traceability of the documents to the specific plant equipment
 - Technical review of the qualification test reports to ensure their applicability, completeness, correctness and accuracy
 - Resolution of test failures and anomalies
 - Positive statement of qualification
 - Listing of special EQ related maintenance, parts replacement and installation requirements

4. Sample qualification document package(s) to verify implementation of the procedure for review and approval
5. Verification of computer software used for analysis and evaluation (e.g. finite element analysis used for seismic qualification of control panels, motors)
6. Effectiveness of the QA/QC programme of the supplier of EQ services

Elements of review: Equipment qualification test facility activities

1. Effectiveness of the QA/QC programme, including appropriate control of subcontracted services

2. Procedures for:

- generating a specific test plan and procedure for each testing activity
- proper identification and control of test specimens throughout the test cycle
- the control of measurement and testing equipment calibration
- witnessing and signing off of test and data collection by QC personnel
- recording, evaluating, dispositioning and documenting failures and anomalies which may occur during tests
- the control of receipt, storage and handling of test specimens
- the preparation, review and approval of test reports
- the appropriate training of personnel involved in testing

3. Documentation verifying that the appropriate personnel are qualified
4. Actual qualification test reports and supporting documentation
5. Physical inspection of the test facility for compliance with its own procedures
6. Acceptance criteria for evaluation of test results

Ongoing/routine surveillance and inspections of EQ programme

Session 7.2



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Characteristics of ongoing/routine surveillance of EQ programme

- Performed by plant QA/QC personnel and also by inspectors of the national regulatory authority
- Inspect EQ-related operation, maintenance, procurement and material control activities
- Look at EQ-related activities directly, and also observe EQ-activity oversight by plant QA/QC, engineering, and management
- Observe equipment that is supposed to be qualified during routine NPP tours

Elements of review: Operation, maintenance, procurement and material control activities

1. Implementation of EQ-related maintenance and parts replacement requirements in sample maintenance and surveillance procedures
2. Timely performance of EQ-related maintenance in sample EQ-related maintenance work orders; if not, engineering evaluation?
3. Correct performance of selected EQ-related maintenance activities; preservation of qualified configuration
4. Control and monitoring of environmental conditions

4. Performance of equipment surveillance activities (timely and correct?) and generation of required records/reports (as-found conditions)
5. Documentation of failures, abnormal conditions, system modifications and part replacements
6. Perform periodic walkdowns of plant equipment and systems to identify any abnormal conditions of qualified equipment (e.g. missing bolts, covers, gaskets, damaged insulation, leaks)

7. Implementation of approved procedures in repairs of qualified equipment at special on-site maintenance and/or vendor facilities and generation of required qualification documentation
8. Material control - control and tracking of dated materials (shelf life, service life)
9. Implementation of EQ-related storage requirements in warehouse facilities

10. Control of procurement documents associated with parts specification
11. Requirements associated with receipt inspection and their implementation
12. Control of 'Approved Suppliers' list
13. Control of equipment and system design modifications

Conclusion

- Plant specific EQ programmes should provide assurance that equipment important to safety will perform its safety functions when required throughout the life of the plant.
- To help achieve this objective, periodic reviews and ongoing surveillance of EQ programme activities verify the effectiveness of the EQ programmes and identify areas for improvement.