

15.0 MANAGEMENT MEASURES

15.3 MAINTENANCE

15.3.1 PURPOSE OF REVIEW

The purpose of this review is to establish reasonable assurance that the facility will have an adequate maintenance program for items relied on for safety--with the exception of personnel activities--to ensure their availability and reliability to perform their intended safety functions when needed. The maintenance performed to meet the availability and reliability requirements for the items relied on for safety should be commensurate with risk levels identified in the ISA Summary.

15.3.2 RESPONSIBILITY FOR REVIEW

Primary: Project Manager

Secondary: Quality Assurance, Criticality, Chemical, Fire, Radiation Protection and Environmental Reviewers

Supporting: Fuel Cycle Facility Inspector

15.3.3 AREAS OF REVIEW

The applicant's description of its maintenance program should be reviewed during the license application with emphasis on demonstrating that items relied on for safety with the exception of personnel activities (safety controls) are inspected, calibrated, tested and maintained so as to ensure their ability to perform their safety functions when needed. The safety controls should be identified by the ISA Summary (discussed in Chapter 5.0 of this SRP). Individual components and support systems for the safety controls may have to be individually maintained to ensure the availability and reliability of the control function. The reviewers should review the applicant's description of how each of the following essential components is implemented within the site organization:

- A. Surveillance/monitoring;
- B. Corrective maintenance;
- C. Preventive maintenance; and
- D. Functional testing.

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15.3.4 ACCEPTANCE CRITERIA

15.3.4.1 Regulatory Requirements

The requirement for maintenance is addressed in the following:

Nuclear Regulatory Commission (U.S.), Washington, D.C. "Domestic Licensing of Special Nuclear Material (10 CFR Part 70)." *Federal Register*: Vol. 64, No. 146. pp. 41338--41357. July 30, 1999.

Specific references are as follows:

- A. In § 70.4, "Definitions," the term management measures is defined. Maintenance is included as a management measure.
- B. In § 70.62(d), the applicant is required to establish management measures to provide continuing assurance of compliance with the performance requirements.
- C. In § 70.64(a)(1), the design of new facilities or the design of new processes at existing facilities is required to be developed and implemented in accordance with management measures.
- D. In § 70.64(a)(8), inspection, testing, and maintenance are required to be addressed as one of the Baseline Design Criteria to provide reasonable assurance that items relied on for safety will be designed to allow them to be adequately inspected, tested and maintained to ensure their availability and reliability to perform their function when needed.
- E. In § 70.65(a), the application is required to include a description of the management measures.

15.3.4.2 Regulatory Guidance

There are no regulatory guides that apply to maintenance for a new facility licensed under 10 CFR Part 70.

15.3.4.3 Regulatory Acceptance Criteria

As part of the application for construction approval, the applicant should commit to establishing a maintenance program which meets or exceeds the acceptance criteria in Section 15.3.4.

The applicant's maintenance program should be considered acceptable (for the license approval) if it adequately addresses the following:

- A. Safety Controls Identified in the ISA

An assessment of whether components and support systems need to be individually maintained to ensure the availability and reliability of specific safety controls. The reliability and availability of a particular item should be commensurate with the risk levels identified in the ISA.

B. Essential Components

- i. Surveillance/monitoring: The surveillance/monitoring function, its responsible organization, and the conduct of surveillance/monitoring at specified frequencies to measure the degree to which safety functions or safety controls meet performance specifications. This activity is used in setting preventive maintenance frequencies for safety controls and the determination of performance trends for safety controls. How results from incident investigations (described in Section 15.7 of this SRP) and identified root causes are used to modify the affected maintenance function and eliminate or minimize the root cause from recurring should be addressed. For surveillance tests that can only be done while equipment is out of service, proper compensatory measures should be prescribed for the continued normal operation of a process.
- ii. Corrective maintenance: The documented approach used to perform corrective actions or repairs on safety controls. The maintenance function should provide a planned, systematic, integrated and controlled approach for the repair and replacement activities associated with identified failures of safety controls.
- iii. Preventive maintenance: A description of the preventive maintenance (PM) function that demonstrates a commitment to conduct preplanned and scheduled periodic refurbishing or partial or complete overhaul for the purpose of ensuring that unplanned outages of selected safety controls do not occur. This activity includes using the results of the surveillance/monitoring component of maintenance. Instrumentation calibration and testing should be addressed as part of this component.
- iv. Functional testing: A description of the functional testing function that demonstrates a commitment to the functional testing of safety controls after corrective or preventive maintenance or calibration. Functional testing should be conducted using approved procedures that include compensatory measures while the test is being conducted.

C. Work Control Methods

A list of maintenance-related work control methods.

D. Relationship of the Maintenance Elements to Other Management Control Sections Discussed in SRP Chapter 15.0

A discussion of how the maintenance function utilizes, interfaces with, or is linked to these elements.

15.3.5 REVIEW PROCEDURES

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15.3.5.1 Acceptance Review

The primary reviewer should perform an acceptance review to determine if the application for a license adequately addresses the specific items in Section 15.3.3, "Areas of Review." If the primary reviewer verifies that maintenance is adequately addressed, the primary reviewer should accept the application for the safety evaluation in Section 15.3.5.2. If the primary reviewer identifies significant deficiencies in the material provided, the primary reviewer should request that the applicant submit additional information prior to the start of the safety evaluation.

15.3.5.2 Safety Evaluation

For construction approval, the reviewer should determine that the applicant has committed to a maintenance program that will meet or exceed the acceptance criteria in Section 15.3.4.

For a license application for operations approval and after determining that the application is acceptable for review in accordance with Section 15.3.5.1, the primary reviewer should perform a safety evaluation against the acceptance criteria described in Section 15.3.4. On the basis of its review, the staff may request that the applicant provide additional information or modify the application to meet the acceptance criteria in SRP Section 15.3.4.

The primary reviewer should establish that the applicant's maintenance program meets or exceeds the acceptance criteria. The primary reviewer should determine if the applicant has adequately planned the work to be accomplished and whether necessary policies, procedures, and instructions either are in place or will be in place before work starts. The primary reviewer should also determine that there is reasonable assurance that the applicant's quality assurance, configuration management, and maintenance programs, as described in SRP Sections 15.1 through 15.3, are coordinated.

When an applicant's maintenance program references other sections of the application, the primary reviewer should confirm that these sections of the application are consistent with the applicant's selection of acceptance criteria and the proposed method for implementation.

The primary reviewer should coordinate with secondary staff reviewers to ensure there is no contradiction between maintenance and other areas of the application. The secondary staff reviewers should ensure that the scope of the applicant's maintenance program includes the items relied on for safety that are in their primary review areas of the application. The supporting staff reviewer (Fuel Cycle Facility Inspector) should become familiar with the applicant's maintenance program and determine whether ongoing activities are in agreement with it.

15.3.6 EVALUATION FINDINGS

The primary reviewer should document the safety evaluation by preparing material suitable for inclusion in the Safety Evaluation Report (SER). The primary reviewer should describe the review, explain the basis for the findings, and state the conclusions.

The staff could document the safety evaluation for construction approval by stating that the applicant has committed to establishing a maintenance program that meets or exceeds the acceptance criteria contained in Section 15.3.4 of NUREG-1718.

The staff could document the safety evaluation for the license application for operations as follows:

The staff reviewed the license application for [insert facility name] according to Section 15.3 of NUREG-1718. Based on the review of the license application, the staff concluded that the applicant committed to maintenance of items relied on for safety with the exception of personnel activities (safety controls). [Insert a summary statement of what was evaluated and why the reviewer finds the submittal acceptable.] The applicant's maintenance commitments contain the basic elements to ensure availability and reliability: surveillance/monitoring, corrective maintenance, preventive maintenance, and functional testing. The applicant's maintenance function is proactive, using surveillance/monitoring and maintenance records to analyze equipment performance and identify the root causes of repetitive failures.

In addition, the surveillance/monitoring activities described in this section of the application provide assurance of the validity of the ISA by examination and calibration and testing of equipment that monitors process safety parameters and acts to prevent or mitigate accident consequences.

The maintenance function: (1) is based on approved procedures; (2) employs work control methods that properly consider personnel safety, awareness of facility operating groups, quality assurance, and the rules of configuration management; (3) links items relied on for safety requiring maintenance to the ISA; (4) justifies the preventive maintenance intervals in the terms of equipment reliability goals; (5) provides for training that emphasizes importance of ISA identified controls, regulations, codes, and personal safety; and (6) creates documentation that includes detailed records of all surveillances, inspections, equipment failures, repairs, and replacements.

The staff concludes that the applicant's maintenance function meets the requirements of 10 CFR Part 70 and provides reasonable assurance that the environment and the health and safety of the public are protected.

15.3.7 REFERENCES

- A. Code of Federal Regulations, *Title 10, Energy*, Part 70, Domestic Licensing of Special Nuclear Material, U.S. Government Printing Office, Washington, D.C., 1999.

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- B. Nuclear Regulatory Commission (U.S.), Washington, D.C. "Domestic Licensing of Special Nuclear Material (10 CFR Part 70)." *Federal Register*: Vol. 64, No. 146. pp. 41338--41357. July 30, 1999.
- C. Code of Federal Regulations, *Title 10, Energy*, Subpart 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."
- D. Code of Federal Regulations, *Title 29, Labor*, Subpart 1910.119, "Process Safety Management of Highly Hazardous Chemicals."
- E. Code of Federal Regulations, *Title 40, Protection of Environment*, Part 68, "Risk Management Program for Chemical Accidental Release Prevention."
- F. Nuclear Regulatory Commission (U.S.), Washington, D.C. "Guidance on Management Controls/Quality Assurance, Requirements for Operation, Chemical Safety, and Fire Protection for Fuel Cycle Facilities." *Federal Register*: Vol. 54, No. 53. pp. 11590–11598. March 21, 1989.
- G. Nuclear Regulatory Commission, (U.S.) (NRC). Regulatory Guide 1.160, Rev. 2, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." NRC: Washington, D.C. March 1997.
- H. Nuclear Regulatory Commission, (U.S.) (NRC). Inspection Procedure 88025, "Maintenance and Surveillance Testing." NRC: Washington, D.C. May 23, 1984.
- I. Nuclear Regulatory Commission, (U.S.) (NRC). Inspection Procedure 88062, "Maintenance and Inspection." NRC: Washington, D.C. January 1996.