

MANAGEMENT MEASURES

11.3 MAINTENANCE

11.3.1 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 availability and reliability requirements of the items should be commensurate with risk levels identified in the ISA.

11.3.2 RESPONSIBILITY FOR REVIEW

Primary: Licensing Project Manager

Secondary: Quality assurance, Criticality, chemical, fire, radiation protection and environmental reviewers

Supporting: Site Representative/Facility Inspector

11.3.3 AREAS OF REVIEW

The applicant's description of its maintenance program should be reviewed 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 (discussed in Chapter 3.0 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 functions is implemented within the site organization.

1. Surveillance/monitoring
2. Corrective maintenance
3. Preventive maintenance
4. Functional testing

11.3.4 ACCEPTANCE CRITERIA

11.3.4.1 Regulatory Requirements

Management Measures

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:

1. In § 70.4, "Definitions," the term management measures is defined. Maintenance is included as a management measure.
2. In § 70.62(d), the applicant or licensee is required to establish management measures to provide continuing assurance of compliance with the performance requirements.
3. 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.
4. 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.
5. In § 70.65(a), the application is required to include a description of the management measures.

11.3.4.2 Regulatory Guidance

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

11.3.4.3 Regulatory Acceptance Criteria

The applicant's submittal should be considered acceptable in the area of maintenance if it adequately addresses the following:

1. 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.
2. Essential Components
 - a. Surveillance/monitoring – the surveillance/monitoring function, its responsible organization, and the conduct of surveillance at a specified frequency to measure the degree to which safety functions of 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 11.8 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.

- b. 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.
 - c. Preventive maintenance – a description of the preventive maintenance 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.
 - d. 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.
3. Work Control Methods – A list of maintenance-related work control methods.
 4. Relationship of the Maintenance Elements to Other Management Control Sections Discussed in SRP Chapter 11.0 – A discussion of how the maintenance function utilizes, interfaces with, or is linked to these elements.

11.3.5 REVIEW PROCEDURES

11.3.5.1 Acceptance Review

The primary reviewer should evaluate the application to determine whether it addresses the “Areas of Review” discussed in Section 11.3.3, above. If significant deficiencies are identified, the applicant should be requested to submit additional material before the start of the safety evaluation.

11.3.5.2 Safety Evaluation

After determining that the application is acceptable for review in accordance with Section 11.3.5.1, above, the primary reviewer should perform a safety evaluation against the acceptance criteria described in Section 11.3.4. The staff review should be based on an assessment of the material presented. The review should determine if the applicant has

Management Measures

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 review should result in a determination that there is reasonable assurance that the applicant's quality assurance, configuration management and maintenance programs, as described in SRP Sections 11.1 through 11.3 are coordinated.

When an applicant's maintenance program references other sections of the application, the primary reviewer should review these other sections of the application to ensure consistency with the applicant's selection of acceptance criteria and the proposed method for implementation.

Secondary staff reviewers should review the maintenance program to ensure there is no contradiction between it and their primary review areas of the application. They should also 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 should become familiar with the applicant's maintenance program and determine whether ongoing activities are in agreement with it.

The final step in the review is the primary staff reviewer's writing of a Safety Evaluation Report (SER) input that should summarize the conduct of the review, identifies what material in the application forms the basis for a finding of reasonable assurance with respect to the acceptance criteria, and presents the bases for license conditions that may be necessary to conclude that reasonable assurance is achieved.

11.3.6 EVALUATION FINDINGS

The staff's evaluation should verify that the license application provides sufficient information to satisfy the regulatory requirements of Section 11.3.4.1 and that the regulatory acceptance criteria in Section 11.3.4.3 have been appropriately considered in satisfying the requirements. On the basis of this information, the staff should conclude that this evaluation is complete. The reviewers should write material suitable for inclusion in the SER prepared for the entire application. The SER should include a summary statement of what was evaluated and the basis for the reviewers' conclusions.

The staff can document the evaluation as follows:

The applicant has 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 surveillance, 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.

11.3.7 REFERENCES

1. 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.
2. Code of Federal Regulations, *Title 10, Energy*, Subpart 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."
3. Code of Federal Regulations, *Title 29, Labor*, Subpart 1910.119, "Process Safety Management of Highly Hazardous Chemicals."
4. Code of Federal Regulations, *Title 40, Protection of Environment*, Part 68, "Risk Management Program for Chemical Accidental Release Prevention."
5. 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.
6. 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.
7. Nuclear Regulatory Commission, (U.S.) (NRC). Inspection Procedure 88025, "Maintenance and Surveillance Testing." NRC: Washington, D.C. May 23, 1984.
8. Nuclear Regulatory Commission, (U.S.) (NRC). Inspection Procedure 88062, "Maintenance and Inspection." NRC: Washington, D.C. January 1996.

Management Measures