

NRC INSPECTION MANUAL

IIPB

INSPECTION PROCEDURE 62706

MAINTENANCE RULE

PROGRAM APPLICABILITY: 2515

62706-01 INSPECTION OBJECTIVE

To verify the implementation of 10 CFR 50.65, "the maintenance rule" (Ref. 1).

62706-02 INSPECTION REQUIREMENTS

Verify Implementation of the Maintenance Rule. Perform the following reviews to verify the licensee's implementation of the maintenance rule (i.e., the rule), following the guidance of Nuclear Management and Resources Council (NUMARC) 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (Ref. 2).

02.01 Goal Setting and Monitoring, 50.65(a)(1). Verify that the licensee has implemented goal setting and monitoring as required by paragraph (a)(1) of the rule. The licensee is required by the rule to perform the following:

- a. Monitor the performance or condition of structures, systems, and components (SSCs) against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs, as defined in 10 CFR 50.65(b), are capable of fulfilling their intended functions.
- b. Establish goals commensurate with safety and, where practical, take into account industry-wide operating experience.
- c. Take appropriate corrective action when the performance or condition of an SSC does not meet established goals.

02.02 Preventive Maintenance, 50.65(a)(2). For those SSCs that are within the scope of the rule but are not monitored under paragraph (a)(1) of the rule, verify that the licensee has demonstrated the following:

- a. Performance or condition of a SSC is being effectively controlled through the performance of appropriate preventive maintenance such that the SSC remains capable of performing its intended function; or,
- b. The SSC is inherently reliable and has low safety significance; therefore, preventive maintenance may not be required (i.e., perform corrective maintenance only).
- c. The SSCs that provide little or no contribution to system safety function could be allowed to run to failure (i.e., perform corrective maintenance rather than preventive maintenance).

02.03 Periodic Evaluation, 50.65(a)(3). Verify that the licensee is performing the periodic evaluations and safety assessments required by paragraph (a)(3) of the maintenance rule.

- a. The licensee shall evaluate performance and condition monitoring activities, associated goals, and preventive maintenance activities at least every refueling cycle, provided that the interval between evaluations does not exceed 24 months. The evaluations shall consider industry-wide operating experience, where practical.
- b. The licensee shall make adjustments where necessary to ensure that the objective of preventing failures of SSCs through maintenance is appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventative maintenance activities.

See Inspection Procedure 7111.12, "Maintenance Rule Implementation."

02.04 Safety Assessments Before Performing Maintenance, 50.65(a)(4). Verify that the licensee assesses and manages increases in risk before performing maintenance activities required by paragraph (a)(4) of the maintenance rule.

See Inspection Procedure 7111.13, "Maintenance Risk Assessments and Emergent Work Control."

02.05 Scope of the Rule, 50.65(b). Verify that the licensee has identified those SSCs that are required to be within the scope of the maintenance rule, as defined in paragraph 50.65(b) of the rule.

62706-03 INSPECTION GUIDANCE

General Guidance

Inspection Requirements. All inspection requirements listed in Section 02 do not have to be performed during each inspection. NRC management may decide that specific inspection requirements be reviewed for implementation of the maintenance rule based on plant performance indicating a potential weakness in a particular inspection requirement. In addition, NRC management may decide to select specific inspection requirements to be performed based on

the allocation of resources available. The items selected for review will depend on the intended scope of the inspection and the resources allotted for the inspection. In addition, inspectors should also note that despite the fact that items selected for review are listed under inspection requirements, they may not be explicitly stated in the maintenance rule. Rather, these items may be derived from Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (Ref 3) or NUMARC 93-01, which are optional guidance documents and, therefore, would not apply to those licensees who implement the rule using other methods.

Implementation Guidance. Except when the licensee proposes an alternate method for complying with specified portions of the maintenance rule, the methods described in Regulatory Guide 1.160 will be used to evaluate the effectiveness of maintenance activities of licensees who are required to comply with the maintenance rule. Regulatory Guide 1.160 endorses NUMARC 93-01 and provides methods acceptable to the NRC for complying with the maintenance rule. The inspector should also be aware that licensees may use methods other than those described in Regulatory Guide 1.160 and NUMARC 93-01 to satisfy the requirements of the maintenance rule. Where other methods are used, the licensee must demonstrate that those methods satisfy the requirements of the rule.

Requirements vs. Acceptable Methods. The information provided in the specific guidance section of this procedure was derived from information contained in the maintenance rule, the statements of consideration (SOC) for the rule (Ref. 4), Regulatory Guide 1.160, and the industry guideline, NUMARC 93-01. Reference was made to the source document, where possible, in order to help the inspector differentiate between the regulatory requirements and recommendations. In general, anything that is stated in the rule itself is a requirement. The SOC does not contain requirements but does contain information that could be used to clarify the intent of the requirements. Information derived from Regulatory Guide 1.160 and its endorsed industry guideline, NUMARC 93-01, provide acceptable methods for complying with the rule, but they are not regulatory requirements. If the licensee chooses not to implement the maintenance rule in accordance with the regulatory guide and the industry guideline, then the licensee must demonstrate that the alternate methods satisfy the requirements of the rule.

Most licensees have implemented the maintenance rule using the guidance contained in NUMARC 93-01. However, licensees have also used other methods that the NRC staff has found acceptable for implementing the rule. Inspectors should determine whether the licensee has taken exceptions to NUMARC 93-01 and has documented justifications for these exceptions. Exceptions to NUMARC 93-01 shall meet the requirements of the rule.

Decommissioned Plants. Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program," provides guidance and requirements for the inspection of maintenance and surveillance activities at power reactors that have submitted 10 CFR 50.82(a)(1) certifications. Inspectors should use Inspection Procedure 62801, "Maintenance and

Surveillance at Permanently Shutdown Reactors," when inspecting maintenance rule requirements at power reactors with 50.82(a)(1) certifications.

Maintenance Rule Guideline Book. The Quality Assurance and Maintenance Branch (IQMB) compiled a Maintenance Rule Guideline Book which contains NRC and industry guidance on acceptable methods to implement the individual requirements of the maintenance rule. The inspection requirements for the maintenance rule are listed in Sections 2.01 through 2.05 of this procedure. The inspector should refer to the Maintenance Rule Guideline Book for additional inspection guidance. The Maintenance Rule Guideline Book includes information such as:

- 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"
- Statements of Consideration for 10 CFR 50.65, *Federal Register*, Vol. 56, No. 132, July 10, 1991, pages 31306–31323 (56 FR. 31306)
- 10 CFR 50.65(a)(1), "Rule Change, Monitoring the Effectiveness of Maintenance at Plants in a Decommissioning Status" *Federal Register*, Vol. 61, No 146, July 29, 1996, pages 39278, 39288 & 39301 (61 FR 39278)
- Statements of Consideration for 10 CFR 50.65(a)(4), *Federal Register*, Vol 64, No. 137, dated July 19, 1999, pages 38551-38557 (64 FR 38551)
- Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"
- Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants, dated May, 2000
- NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"
- Inspection Procedure (IP) 62706, "Maintenance Rule."
- Inspection Procedure (IP) 62707, "Maintenance Observations," April 22, 1996
- IP 71111, Attachment 12, "Maintenance Rule Implementation."
- IP 71111, Attachment 13, "Maintenance Risk Assessments and Emergent Work Control."
- Maintenance Rule Enforcement Guidance
- Simplified Maintenance Rule Flow Chart

Historical Information. In addition to the Maintenance Rule Guideline Book, historical information is contained in NUREG-1526, "Lessons Learned From Early Implementation of the Maintenance Rule at Nine Nuclear Power Plants," dated June 1995 (Ref. 6). Temporary

Instruction 2515/126, "Evaluation of On-Line Maintenance," was used by inspectors to verify the level of utility control for on-line maintenance activities while at power.

Lessons Learned from Maintenance Rule Baseline Inspections. Licensees are expected to have reviewed information contained in NUREG-1648, "Lessons Learned from Maintenance Rule Baseline Inspections," dated October 1999 (Ref 7). This document contains information on unique and diverse methods licensees used to implement the maintenance rule that went beyond the guidance contained in the documents noted above. Licensees can use this information to improve site-specific maintenance rule programs.

Specific Guidance

03.01 Goal Setting and Monitoring, 10 CFR 50.65(a)(1). The licensee is required to set goals and monitor the performance or condition of those SSCs handled under paragraph (a)(1) of the rule.

The licensee should consider monitoring SSCs under the requirements of paragraph (a)(1) of the maintenance rule when failures occur, performance criteria are not being met under paragraph (a)(2), adequate preventive maintenance has not been established, or cause determinations and corrective actions are needed to improve SSC performance. If any of the above conditions exist, the licensee should consider establishing goals commensurate with safety and, where practical, take into account industry wide-operating experience.

03.02 Preventive Maintenance, 50.65(a)(2). The maintenance rule states that monitoring of an SSC as specified in paragraph (a)(1) is not required if it has been demonstrated that the performance or condition of the SSC is being effectively controlled through the performance of appropriate preventive maintenance so that the SSC remains capable of performing its intended function. The SOC clarify that licensees are not required to monitor under paragraph (a)(1) of the rule if they have demonstrated that preventive maintenance has been effective or if an SSC has inherent high reliability and availability.

The licensees must be able to demonstrate that an effective preventive maintenance program exists in controlling the performance or condition of an SSC so that the SSC remains capable of performing its intended function. Although no monitoring process is required by paragraph (a)(2), in order to assure itself, the licensee needs to establish some evaluation or monitoring process under paragraph (a)(2) of the maintenance rule to verify that preventive maintenance is effective.

03.03 Periodic Evaluations Under 50.65 (a)(3). The licensee is required by paragraph (a)(3) of the maintenance rule to perform the following periodic evaluations:

The licensee must perform the periodic evaluations at least once per refueling cycle, not to exceed an interval of 24 months. Adjustments shall be made to goals, performance criteria, or preventive maintenance when equipment performance has not met

established goals or performance criteria. The licensee should consider industry operating experience, where practical, when establishing goals. Adjustments shall be made where necessary to ensure that the objective of preventing failures of SSCs through maintenance is appropriately balanced against the objective of minimizing unavailability of SSCs due to monitoring or preventive maintenance activities.

03.04 Assessing and Managing Increases in Risk Before Performing Maintenance, 50.65(a)(4). The licensee is required by paragraph (a)(4) to assess and manage the increase in risk that may result from the proposed maintenance activities before these maintenance activities are performed. These maintenance activities include but are not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance activities. The licensee may limit the scope of the assessment to SSCs that a risk-informed evaluation process has shown to be significant to public health and safety.

The licensee should implement the requirements of this section using the guidance contained in NUMARC 93-01, Section 11, "Assessment of Risk Resulting from the Performance of Maintenance Activities," dated February 22, 2000, as endorsed of RG 1.182, dated May 2000.

03.05 Scope of the Rule, 50.65(b). Under paragraph (b) of the maintenance rule, the licensee must identify safety-related SSCs that are relied upon to remain functional during and following design basis events to ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, or the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposures comparable to 10 CFR Part 100 guidelines. In addition, the licensee must identify non-safety-related SSCs that: (1) are relied upon to mitigate accidents or transients or are used in the plant emergency operating procedures, or (2) whose failure could prevent safety-related systems from performing their intended safety-related function, or (3) whose failure could cause a reactor scram or actuation of a safety-related system.

The licensee must document all SSCs that have been identified as being under the scope of the maintenance rule. The licensee should use the guidance contained in RG 1.160 and NUMARC 93-01 to implement their program for identifying safety-related and non-safety-related SSCs under the scope of the maintenance rule but may consider other methods.

62706-04 RESOURCE ESTIMATE

A maintenance rule baseline inspection team utilizes five to six inspectors to complete the inspection. The team consists of one team leader, three to four inspectors performing maintenance rule program reviews and sample reviews of SSCs under the scope of the maintenance rule to verify that all maintenance rule requirements have been implemented for each SSC. In addition, one specialist

inspector, utilizing probabilistic risk assessment (PRA) expertise, determines if the licensee is appropriately using PRA to implement maintenance rule requirements for high safety (risk) significant (HSS) and low safety (risk) significant (LSS) SSCs under the scope of the maintenance rule.

Completion of this inspection procedure is expected to take a minimum of 600 inspection hours: five inspectors for 3 weeks performing 1 week of inspection preparation, 1 week on-site, and 1 week of inspection documentation.

62706-05 REFERENCES

U.S. Nuclear Regulatory Commission, 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants" (the maintenance rule)

Nuclear Management and Resources Council, NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"

U.S. Nuclear Regulatory Commission, Statements of Consideration, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Federal Register, Vol. 56, No. 132, Wednesday July 10, 1991, pages 31306 to 31323

Maintenance Rule Guideline Handbook

U.S. Nuclear Regulatory Commission, NUREG 1526, "Lessons Learned From Early Implementation of the Maintenance Rule at Nine Nuclear Power Plants," June 1995

U.S. Nuclear Regulatory Commission, NUREG-1648, "Lessons Learned from Maintenance Rule Baseline Inspections," dated October, 1998

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