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Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52

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Nuclear Energy Institute

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EXECUTIVE SUMMARY

NEI 07-02, *Generic FSAR Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52,* provides a complete generic program description for use in developing combined license (COL) application final safety analysis reports. The document is consistent with Regulatory Guide 1.206 (Draft Guide DG-1145), *COL Applications for Nuclear Power Plants (LWR Edition).* A main objective of this program description is NRC-approved, standardized FSAR content that expedites NRC review and issuance of the combined license.

TABLE OF CONTENTS

EXECUTIVE SUMMARY i

17.X MAINTENANCE RULE PROGRAM 1

17.X.1 MAINTENANCE RULE PROGRAM DESCRIPTION 1
17.X.1.1 Maintenance rule scoping per 10 CFR 50.65(b) 1
17.X.1.2 Monitoring and corrective action per 10 CFR 50.65(a)(1) 2
17.X.1.3 Preventive maintenance per 10 CFR 50.65(a)(2) 2
17.X.1.4 Periodic evaluation of monitoring and preventive maintenance per 10 CFR 50.65(a)(3) 3
17.X.1.5 Risk assessment and risk management per 10 CFR 50.65(a)(4) 4
17.X.2 MAINTENANCE RULE TRAINING AND QUALIFICATION 4
17.X.3 MAINTENANCE RULE PROGRAM RELATIONSHIP WITH RELIABILITY ASSURANCE ACTIVITIES 4
17.X.4 MAINTENANCE RULE PROGRAM RELATIONSHIP WITH INDUSTRY OPERATING EXPERIENCE ACTIVITIES 4
17.X.5 MAINTENANCE RULE PROGRAM IMPLEMENTATION 5
17.X.6 REFERENCES 5

GENERIC FSAR TEMPLATE GUIDANCE FOR MAINTENANCE RULE PROGRAM DESCRIPTION FOR PLANTS LICENSED UNDER 10 CFR PART 52

17.X MAINTENANCE RULE PROGRAM

The Maintenance Rule (MR) Program provides assurance that structures, systems, and components (SSCs) within the scope of the program remain reliable and capable of fulfilling their intended functions and provides processes for assessing and managing potential increases in risk that might result from proposed maintenance activities. The MR Program meets the requirements of 10 CFR 50.65 (Reference 1).

17.X.1 MAINTENANCE RULE PROGRAM DESCRIPTION

The MR program follows the guidance in NUMARC 93-01 (Reference 2), as endorsed and modified by Regulatory Guide (RG) 1.160, (Reference 3) and revised Section 11.0 of NUMARC 93-01 (Reference 4), as endorsed and modified by RG 1.182 (Reference 5), without any exceptions that could materially and negatively affect the effectiveness of the program. The principal functions of the program are described in the following subsections**.**

The MR program includes appropriate control of procedures, documents, computer software and data, as applicable.

17.X.1.1 Maintenance rule scoping per 10 CFR 50.65(b)

17.X.1.1.a The SSCs within the scope of the MR program include safety-related SSCs and certain non-safety-related SSCs, as determined using a MR scoping procedure. The scoping procedure addresses:

- Safety-related SSCs.
- Non-safety-related SSCs that mitigate accidents or transients.
- Non-safety-related SSCs that are used in Emergency Operating Procedures, where 'used' means directly used to mitigate the accident or transient via explicit reference in the EOP or used in steps of procedures referenced by the EOP. Additionally, SSCs explicitly referenced in back-up or lower-tier methods in the EOPs and provide reasonable assurance of mitigation success, or whose use is implied in an EOP and essential to the completion of an EOP step, are considered within scope of the Maintenance Rule.
- Non-safety-related SSCs whose failure prevents safety-related SSCs from fulfilling their safety-related functions.
- Non-safety-related SSCs whose failure causes scrams or actuates safety systems.

The SSCs within the scope of the MR program are evaluated against performance criteria to determine which SSCs will have goals established and monitoring activities performed in accordance with 10 CFR 50.65(a)(1).

17.X.1.1.b Safety significance classifications and bases of in-scope SSCs, e.g., high safety significance (HSS) or low safety significance (LSS), are determined using processes consistent with Section 9.3.1 of NUMARC 93-01. They include determination of risk significance criteria and appropriate consideration of operating experience, generic failure data, component reliability information, probabilistic risk assessment (PRA) insights, and the recommendations of an expert panel. All SSCs identified as risk-significant via the Reliability Assurance Program for the design phase (DRAP – see FSAR Section 17.Y) are included within the initial MR scope as HSS SSCs. This includes risk-significant SSCs identified as part of the design certification phase or follow-on COL applicant/holder phases of DRAP.

17.X.1.1.c The expert panel is established in accordance with NUMARC 93-01 prior to fuel load authorization and utilizes operating, maintenance and systems expertise, PRA insights, and other applicable information to update and maintain the MR scope and SSC classifications.

17.X.1.2 Monitoring and corrective action per 10 CFR 50.65(a)(1)

SSCs within the scope of the MR are initially classified as (a)(2) (ref. Section 17.X.1.3), except where it is determined that an SSC should be initially classified as (a)(1), e.g., an SSC that fails during start-up testing.

SSCs that do not meet performance criteria established for (a)(2) monitoring (ref. Section 17.X.1.3) are evaluated for (a)(1) classification in accordance with MR program procedures, with recommended corrective actions identified as appropriate. Necessary corrective actions are implemented in accordance with the site Corrective Action Program. The MR expert panel reviews whether SSCs are to be classified as (a)(1). Monitoring goals are established for SSCs classified as (a)(1), as appropriate, commensurate with the SSCs' safety significance, and considering applicable industry operating experience, with the objective of providing reasonable assurance that the SSC is proceeding to acceptable performance levels and that the corrective actions taken were effective.

For SSCs that do not meet established (a)(1) monitoring goals following corrective actions initially identified and implemented, appropriate additional corrective actions are taken.

17.X.1.3 Preventive maintenance per 10 CFR 50.65(a)(2)

Monitoring as specified in 10 CFR 50.65(a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled

through the performance of appropriate preventive maintenance (PM), such that the SSC remains capable of performing its intended function.

The MR program includes procedures for managing SSC performance in accordance with 10 CFR 50.65(a)(2) requirements during plant operation consistent with NUMARC 93-01. To monitor the effectiveness of the maintenance performed on the various SSCs, performance criteria are established at the plant, system, train, or component level commensurate with safety, risk significance and SSC function. SSC performance criteria (e.g., failure rate, unavailability or condition-based) are chosen that are reasonable, measurable, and technically appropriate for the purpose of timely identification of degraded SSC performance or condition. For risk-significant SSCs identified via DRAP, performance criteria are consistent with the reliability and availability assumptions used in the PRA.

When a performance criterion is not met, the SSC is evaluated for (a)(1) classification in accordance with MR program procedures, including review by the Expert Panel. Should the Expert Panel conclude that the SSC should not be classified as (a)(1), or that no (a)(1) monitoring goals need be established, a technical justification establishing the appropriateness of continued management of SSC performance under (a)(2) is documented and maintained.

SSCs that provide little or no contribution to system safety function or can be allowed to run to failure due to an acceptable risk may be categorized in a "run-to-failure" status (i.e., perform corrective maintenance rather than preventive maintenance) consistent with NUMARC 93-01.

Comment [j1]: This discussion comes from IP-71111.12

Preventive maintenance is subject to risk assessment and management per 10 CFR 50.65(a)(4) (ref. Section 17.X.1.5).

17.X.1.4 Periodic evaluation of monitoring and preventive maintenance per 10 CFR 50.65(a)(3)

The MR program includes procedures for the periodic evaluation of the performance and condition monitoring activities and associated goals and preventive maintenance activities in accordance with 50.65(a)(3). The following considerations are included:

- how procedures govern the scheduling and timely performance of (a)(3) evaluations.
- documenting, reviewing and approving evaluations, providing and implementing results.
- review of 50.65(a)(1) goals and 50.65(a)(2) performance criteria, condition monitoring criteria, SSC performance and condition history and effectiveness of corrective action
- making adjustments to achieve or restore balance between reliability and availability.
- industry operating experience.

17.X.1.5 Risk assessment and risk management per 10 CFR 50.65(a)(4)

The MR program includes procedures for maintenance risk assessment and management in accordance with 10 CFR 50.65(a)(4), employing the methods described in NUMARC 93-01, Section 11 (Reference 4). The risk from maintenance activities is both assessed (i.e., using a risk-informed process to evaluate the overall contribution to risk of the planned maintenance activities) and managed (i.e., providing plant personnel with proper awareness of the risk, and taking actions as appropriate to control the risk).

The MR program and procedures reflect, as appropriate, consideration of issues associated with grid/offsite power reliability as identified in NRC Generic Letter 2006-02, items 5 and 6.

17.X.2 MAINTENANCE RULE TRAINING AND QUALIFICATION

The MR program is supported by appropriate training and qualification for designated personnel, commensurate with their involvement in MR activities.

17.X.3 MAINTENANCE RULE PROGRAM RELATIONSHIP WITH RELIABILITY ASSURANCE ACTIVITIES

Reliability during the operations phase is assured through the implementation of operational programs, i.e., the MR program, the Quality Assurance Program, inservice inspection and testing programs, the Technical Specifications surveillance test program, and maintenance programs. [COL applicants should provide reference to FSAR sections where applicable operational programs are described and may also identify other applicable programs, if any (e.g., AP1000 Investment Protection Short-Term Availability Controls Program).]

17.X.4 MAINTENANCE RULE PROGRAM RELATIONSHIP WITH INDUSTRY OPERATING EXPERIENCE ACTIVITIES

Industry Operating Experience (IOE) comprises information from a variety of sources that is applicable and available to the nuclear industry with the intent of minimizing, through shared experiences, adverse plant conditions or situations. Sources of IOE include information programs organized by the reactor vendor, safety-related equipment suppliers, the NRC, the Institute of Nuclear Power Operations (INPO) and the Electric Power Research Institute (EPRI).

IOE is reviewed for plant-specific applicability and, where appropriate, is applied in various elements of the MR program and procedures, including scoping, performance/condition criteria development, monitoring, goal-setting, corrective action, training, program assessment, and maintenance and procurement activities. The specific steps for employing IOE in the various MR program areas are contained in program procedures.

17.X.5 MAINTENANCE RULE PROGRAM IMPLEMENTATION

MR Program documents will be developed, maintained, and operational by the time that initial fuel loading has been authorized.

17.X.6 REFERENCES

1 10 CFR 50.65, “Requirements for monitoring the effectiveness of maintenance at nuclear power plants.”
2 Nuclear Management and Resources Council, Inc., "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," NUMARC 93-01, Rev. 2, April 1996.
3 Regulatory Guide 1.160, Rev. 2, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.”
4 Nuclear Management and Resources Council, Inc., “Assessment of Risk Resulting from Performance of Maintenance Activities,” NUMARC 93-01, Section 11, February 22, 2000.
5 Regulatory Guide 1.182, “Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants.”
6 Regulatory Guide 1.206, Rev. 0, “Combined License Applications for Nuclear Power Plants (LWR Edition)”