

January 24, 2008

Mr. Adrian P. Heymer, Senior Director
New Plant Deployment
Nuclear Generation Division
Nuclear Energy Institute
1776 I Street, NW, Suite 400
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SUBJECT: REVISED FINAL SAFETY EVALUATION FOR TOPICAL REPORT NEI 07-02,
"GENERIC FSAR TEMPLATE GUIDANCE FOR MAINTENANCE RULE
PROGRAM DESCRIPTION FOR PLANTS LICENSED UNDER 10 CFR
PART 52," REVISION 3

Dear Mr. Heymer:

By letter dated February 22, 2007, the Nuclear Energy Institute (NEI) submitted for U.S. Nuclear Regulatory Commission (NRC) staff review, its proposed Topical Report NEI 07-02, "Generic FSAR Template Guidance for Maintenance Rule Program Description," Revision 0. In response to the pending issuance of Regulatory Guide (RG) 1.206, Revision 0, this topical report was withdrawn, and subsequently by letter dated July 2, 2007, NEI submitted Revision 1 of NEI 07-02.

In response to the NRC staff's August 23, 2007, request for additional information (RAI), NEI submitted NEI 07-02, Revision 2 on August 31, 2007 and, based on a September 21, 2007 RAI, NEI submitted NEI 07-02, Revision 3 on September 25, 2007. The NRC's Final Safety Evaluation was issued under cover of our letter of December 3, 2007.

As a result of your staff's request for clarification on December 6, 2007, the PRA Licensing, Operations Support & Maintenance Branch of the Division of Safety Systems & Risk Assessment determined that its safety evaluation (SE) for NEI 07-02, Revision 3, warranted revision in order to meet the NRC "Principal for Good Regulation" of "Clarity," in that agency positions should be readily understood and easily applied. The revised safety evaluation report is enclosed. Please note that this enclosure supercedes our previous evaluation published by our letter dated December 3, 2007.

This revision addresses concerns regarding the intent and appropriateness of the listed conditions presented on page 5 of the original version. Condition 3 stated:

If a COL [combined license] applicant determines that additional SSC [structure, system, and component] functions may be added or subtracted prior to fuel load (and the Commission's § 52.103(g) finding), the COL MRPD [maintenance rule program description] will need to be supplemented to include this contingency within the scope of the MR [maintenance rule] Program. Condition 1 also applies.

The causal issue for this "Condition" was determined to be an internal misunderstanding as to the acceptability of the NEI document changes made to address a concern identified as RAI-1 in the NRC's letter of August 23, 2007. Section 4.0, ANALYSIS, has been revised to specifically identify how NEI 07-02, Revision 3 addresses the underlying Standard Review Plan (SRP) Section 17.6 scoping issue.

This revision also addresses conditions 1 and 2 which stated:

If a COL applicant plans to implement its MR Program at any time prior to the regulatory milestone contained in 10 CFR 50.65(a), the COL applicant must supplement or modify the description of MR Program implementation provided in NEI 07-02 to accurately describe the implementation milestone for its MR Program; and

If a COL applicant plans to rely upon implementation of its MR Program to ensure the continued validity of ITAAC [inspection, test, analysis, and acceptance criteria] determinations, then the COL applicant must describe how the MR Program accomplishes that objective in its application.

Further re-evaluation by the staff concluded that these proposed conditions were not necessary in that they can be implemented by the applicant/licensee based on the guidance given in NEI 07-02, without licensing or safety impact. Section 4.1, "Conditions: Maintenance Rule Program Implementation," has been reduced to the specific implementation condition identified in 10 CFR 50.65. Informational notes on inspection scheduling and operational program milestone schedule submittals have been appended to the end of the SE as notes for the COL applicant/licensee. It should be noted that the requirement for operational program milestone updates provides a degree of assurance that the NRC will be informed if the MR Program is implemented early.

Of a more editorial nature, Section 2.0 was expanded by the addition of specific regulatory requirement citations and the RG 1.182 endorsement of NUMARC 93-01.

Enclosed is the staff's revised SE which defines the basis for acceptance of NEI 07-02, Revision 3. The NRC staff finds that for COL applications, NEI 07-02, Revision 3, provides an acceptable template for assuring that SSCs within the scope of the MR can be maintained to meet the requirements of Title 10 of the *Code of Federal Regulations*, Section 50.65.

Our acceptance applies only to material provided in NEI 07-02, Revision 3. We do not intend to repeat our review of the acceptable material described in the NEI 07-02, Revision 3. When the NEI 07-02, Revision 3 appears as a reference in COL applications, our review will ensure that the material presented applies to the specific application involved. Licensing requests that deviate from NEI 07-02, Revision 3, will be subject to a plant-specific or site-specific review in accordance with applicable review standards.

In accordance with the guidance provided on the NRC website, we request that NEI publish the accepted version of NEI 07-02, Revision 3 within 3 months of receipt of this letter. The accepted version should incorporate this letter which supersedes our letter of December 3, 2007

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and the enclosed revised SE after the title page. The accepted version should also contain historical review information, including NRC RAIs and your responses. The accepted versions shall include a "-A" (designating accepted) following the report identification symbol.

If future changes to the NRC's regulatory requirements affect the acceptability of NEI 07-02, Revision 3, NEI will be expected to revise NEI 07-02 appropriately, or justify its continued applicability for subsequent referencing.

If you have any questions, please contact Michael A. Canova at (301) 415-0737 or via email at mac6@nrc.gov.

Sincerely,

/RA/

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AP1000 Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Project No. 689

Enclosure:
Safety Evaluation

cc w/encl: See next page

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- 3 -

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REVISED SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTORS

FOR TOPICAL REPORT NEI 07-02, REVISION 3

“GENERIC FSAR TEMPLATE GUIDANCE FOR MAINTENANCE RULE PROGRAM

DESCRIPTION FOR PLANTS LICENSED UNDER 10 CFR PART 52”

NUCLEAR ENERGY INSTITUTE

PROJECT NO. 689

1.0 INTRODUCTION AND BACKGROUND

By letter dated February 22, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML070610358), the Nuclear Energy Institute (NEI) submitted for U.S. Nuclear Regulatory Commission (NRC) staff review, proposed topical report NEI 07-02, Revision 0, “Generic FSAR [Final Safety Analysis Report] Template Guidance for Maintenance Rule Program Description for Plants Licensed Under 10 CFR Part 52.” NEI 07-02, Revision 1 was later withdrawn from the review process pending resolution of generic issues associated with the issuance of Regulatory Guide 1.206 (RG 1.206), “Combined License Applications for Nuclear Power Plants” and NUREG-0800, “Standard Review Plan,” Section 17.6, “Maintenance Rule.” On July 2, 2007, NEI submitted NEI 07-02, Revision 1 (ADAMS Accession Number ML072190341), which was intended to be consistent with RG 1.206. In response to NRC staff requests for additional information, NEI 07-02, Revision 2 (ADAMS Accession Number ML072600272) and NEI 07-02, Revision 3 (ADAMS Accession Number ML072700557) were submitted for staff review on August 31 and September 21, 2007, respectively.

NEI 07-02 provides a generic template for the maintenance rule program description (MRPD) for combined license (COL) applications under Title 10 of the *Code of Federal Regulations* 10 CFR, Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.” NEI 07-02 was developed by the NEI New Plant Maintenance Rule Program group to assist in expediting NRC review of the MRPD in COL applications. This topical report will provide further guidance to COL applicants in describing the maintenance rule operational program in the FSAR.

2.0 REGULATORY EVALUATION

The NRC staff reviewed NEI’s submittal pursuant to the following regulations and guidance:

(1) 10 CFR 52.79(a):

This provision requires that a COL application contain a FSAR that describes the facility, presents the design bases and limits on its operation, and presents a safety analysis of the structures, systems, and components (SSCs) of the facility as a whole. In addition,

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10 CFR 52.79(a)(15) requires the FSAR to include a description of the program, and its implementation, for monitoring the effectiveness of maintenance necessary to meet the requirements of 10 CFR 50.65.

(2) 10 CFR 50.65:

Paragraph 50.65(a)(1) requires each holder of a license to operate a nuclear power plant to monitor the performance or condition of SSCs, against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions.

Paragraph 50.65(a)(2) requires that monitoring, as specified in the above-referenced provision, is not required where it has been demonstrated that the performance or condition of a SSCs is being effectively controlled through the performance of appropriate preventative maintenance.

Paragraph 50.65(a)(3) requires that performance and condition monitoring activities and associated goals and preventive maintenance activities be evaluated at least every refueling cycle provided the interval between evaluations does not exceed 24 months.

Paragraph 50.65(a)(4) requires the licensee to assess and manage the increase in risk that may result from the proposed maintenance activities before performing the maintenance activities.

(3) NRC Guidance:

The NRC staff also considered the following NRC guidance documents in the course of reviewing NEI's submittal: (1) Section C.1.17.6 of RG 1.206; (2) RG 1.160, Revision 2, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"; RG 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants" and; NUREG-0800, "Standard Review Plan." In addition to providing guidance that conforms to 10 CFR 50.65, the regulatory guidance listed-above endorses the use of Nuclear Management and Resources Council (NUMARC) 93-01, "Industry Guidance for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

3.0 TECHNICAL EVALUATION

The NRC staff utilized the regulations and regulatory guidance identified in Section 2.0 to determine the acceptability of NEI 07-02 for its intended purpose. NEI 07-02 is divided into several sections: Maintenance Rule Program Description, Maintenance Rule Training and Qualification, Maintenance Rule Program Relationship with Reliability Assurance Activities, Maintenance Rule Program Relationship with Industry Operating Experience Activities, and Maintenance Rule Program Implementation.

3.1 Maintenance Rule Program Description

NEI 07-02 states, "The Maintenance Rule (MR) Program provides assurance that structures, systems and components 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.” Included in the program are appropriate control of procedures, documents, computer software and data.

The MRPD states that SSCs within the scope of the MR Program will be determined using a scoping procedure. SSCs which are scoped into the MR Program include both safety-related and non-safety-related SSCs. The scoping procedure addresses the following classes of SSCs:

- safety-related SSCs
- non-safety-related SSCs that mitigate accidents or transients
- non-safety-related SSCs that are used in emergency operating procedures
- non-safety-related SSCs whose failure could prevent safety-related SSCs from fulfilling their safety-related function
- non-safety-related SSCs whose failure could cause scrams or unwanted safeguard actuations

Once the SSCs are in scope, they are evaluated to establish safety significance and are classified as having either high or low safety significance. This evaluation is consistent with the evaluation described in Section 9.3.1 of NUMARC 93-01. Some of the methods used for establishing the risk significant criteria are industry operating experience (IOE), probabilistic risk assessment (PRA), recommendations of an expert panel, and generic failure data. Risk significant SSCs that were identified via the Reliability Assurance Program for the design phase (DRAP) are included in the initial scope as high-safety-significant SSCs.

Paragraph 50.65(a)(1) requires each licensee to monitor the performance or condition of SSCs against Licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions. However, in accordance with 10 CFR 50.65(a)(2), such monitoring is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through performance of appropriate preventive maintenance. NEI 07-02 states that SSCs are initially classified as 10 CFR 50.65(a)(2), unless they are determined to be classified as 10 CFR 50.65(a)(1) for some reason, for example, the SSC failed during start-up testing. The SSC performance criteria are established at the plant, system, train, or component level commensurate with safety, risk significance and SSC function. The performance criteria are used to monitor the effectiveness of the maintenance performed on the SSCs. The performance criteria selected are technically appropriate, measurable and reasonable. This helps to ensure the timely identification of degrading SSCs. D-RAP identified risk-significant SSCs will have performance criteria that are consistent with the reliability and availability assumptions which are used in the PRA.

Meeting the performance criteria demonstrates that the performance or condition is being effectively controlled by appropriate preventive maintenance and that monitoring under paragraph (a)(1) is not necessary.

If the performance criteria are not met, appropriate corrective actions are identified and the SSCs are then evaluated for 10 CFR 50.65(a)(1) classification in accordance with the MR Program, including review by an expert panel (in accordance with NUMARC 93-01). This expert panel could conclude that the SSC should be moved to 10 CFR 50.65(a)(1) status or have the SSC remain in 10 CFR 50.65(a)(2) status with the appropriate technical justification. SSCs

identified as 10 CFR 50.65(a)(1) will have monitoring goals assigned to them commensurate with safety significance and IOE considerations. This will ensure the corrective actions that were taken are effective and the SSC is proceeding to acceptable levels of performance. If the corrective actions initially identified do not correct the problem and the SSC does not meet the goals, then further additional actions are taken.

The template also provides guidance for run-to-failure. Specifically, the template states: "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 consistent with NUMARC 93-01."

NEI 07-02 further states that the MR Program for periodic evaluation should be in accordance with 10 CFR 50.65(a)(3). Some considerations stated are as follows:

- how procedures govern the scheduling and timely performance of 10 CFR 50.65(a)(3) evaluations
- documenting, reviewing and approving evaluations, providing and implementing results
- making adjustments to achieve or restore balance between reliability and availability
- industry operating experience

For risk assessment and risk management per 10 CFR 50.65(a)(4), NEI 07-02 directs the applicant to the methods described in NUMARC 93-01, Section 11, as endorsed by RG 1.182 which represents an acceptable approach for implementing 10 CFR 50.65(a)(4).¹

3.2 Maintenance Rule Training and Qualification

The MR training and qualification program will be based on regulatory requirements and guidance. All personnel who are involved in the program will be trained to a level that is commensurate with their responsibilities.

3.3 Maintenance Rule Program Relationship With Reliability Assurance Activities

The NEI 07-02 template states that reliability assurance in the operational phase consists of several operational programs including:

- MR Program
- quality assurance program
- in-service inspection and testing program
- technical specification surveillance test program
- maintenance program

¹ For 10 CFR 50.65(a)(4), the guidance contained in Section 11 of NUMARC 93-01 (February 22, 2000 revision), as endorsed by RG 1.182, is effective until this Section 11 guidance has been incorporated into a future full revision of NUMARC 93-01. The NRC review of a future full revision of NUMARC 93-01 would be documented in a new revision to RG 1.160, which would then supersede RG 1.182.

3.4 Maintenance Rule Program Relationship With Industry Operating Experience Activities

The MR Program utilizes IOE, where appropriate, for scoping, performance/condition criteria development, monitoring, goal-setting, corrective action, training, program assessment and maintenance and procurement activities. This IOE data is collected from several sources including reactor vendors, safety-related equipment suppliers, the NRC, the Institute for Nuclear Power Operations (INPO), and the Electric Power Research Institute (EPRI).

3.5 Maintenance Rule Program Implementation

The NEI 07-02 template specifies that the MR Program documents will be developed and maintained and the MR Program implemented by the time that fuel load is authorized (i.e., by the time the Commission makes the finding required in 10 CFR 52.103(g)). The NRC staff's position is that implementation of an acceptable MR Program may occur in advance of the Commission's 10 CFR 52.103(g) finding, with components being monitored or tracked as they become available.

4.0 ANALYSIS

A direct comparison of the criteria for the MRPD, as provided in the review documents identified in Section 2.0, above was made to NEI 07-02. NEI 07-02 was found to closely correspond to the organization and text of RG 1.206 and found to be in compliance with the specific criteria presented in the SRP with one clarification. As identified in NUREG-0800, Section 17.6, III.1, Scoping for 50.65(b), the MRPD scope "should identify that additional SSC functions may be added to or subtracted from the MR scope prior to fuel load, as appropriate, as additional information is developed." This criterion has been covered in NEI 07-02 under two sections (17.X.1.1.b and 17.X.1.1.c). Section 17.X.1.1.b states, "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 [high safety significant] SSCs." This section encompasses the HSS SSCs. The remaining SSCs will be scoped into the program by the formation of the expert panel, prior to fuel load, NEI Section 17.X.1.1.c. This section states, "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 classification." This panel will also scope SSCs into and out of the program as additional information is developed (e.g., emergency operating procedures (EOPs)) after the license is issued.

4.1 Conditions: Maintenance Rule Program Implementation

Paragraph 50.65(a) states, in part, that holders of COLs under 10 CFR Part 52 shall monitor the performance or condition of SSCs (as defined in 10 CFR 50.65(b)) after the Commission makes its finding in accordance with 10 CFR 52.103(g). Paragraph 52.103(g) states that COL holders shall not operate the facility until the Commission makes a finding that the acceptance criteria in the COL are met. Therefore, with regard to MR Program implementation, licensees must implement the requirements of 10 CFR 50.65 by the time that the Commission makes its finding that the acceptance criteria in the COL are met.

5.0 CONCLUSION

The NRC staff used the regulations and regulatory guidance identified in Section 2.0 above as the basis for evaluating the acceptability of NEI 07-02, Revision 3. On the basis of the NRC staff's review of the MR Program template, the staff concludes that the template, as conditioned above, provides adequate guidance for an applicant to describe the following:

- scoping process of SSCs
- classification of SSCs
- determination of performance criteria for 10 CFR 50.65(a)(2) SSCs
- goal setting for 10 CFR 50.65(a)(1) SSCs
- periodic evaluation of monitoring and preventive maintenance
- risk assessments and risk management
- training and qualification
- MR Program relationship with reliability assurance activities
- MR Program relationship with IOE
- MR Program implementation

Further, based on the above evaluation, the staff finds that incorporation of NEI 07-02 by reference in a COL application will provide an acceptable method for (1) complying with the requirement in 10 CFR 52.79(a)(15) that FSARs contain a description of the program, and its implementation, for monitoring the effectiveness of maintenance to meet the requirements of Section 50.65 and (2) satisfying the acceptance criteria of SRP 17.6.

Operational Programs Inspection Scheduling

COL applicants/licensees should note that, as described in RG 1.206, Section C.IV.4, the NRC staff intends to inspect operational programs and their implementation as they are developed and put into place. Implementation of the MR Program will be inspected in accordance with NRC Inspection Manual Chapter IMC-2504, "Construction Inspection Program – Non-ITAAC Inspections."

In accordance with the SRM for SECY-05-0197, each COL will contain a license condition regarding operational programs that will require the licensee to make available to the NRC staff a schedule 12 months after issuance of a COL that supports planning for and conduct of NRC inspections of the operational programs listed in the operational program FSAR table. The condition will also require that the schedule be updated every 6 months until 12 months before scheduled fuel load, and every month thereafter until either the operational programs listed in the FSAR table have been fully implemented or the plant has been placed in commercial service, whichever comes first.

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