December 3, 2007

Mr. Adrian P. Heymer, Senior Director
New Plant Deployment
Nuclear Generation Division
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: 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 In response to the pending issuance of Regulatory Guide 1.206, Revision 0, this topical report was withdrawn, and subsequently by letter dated July 2, 2007, NEI submitted Revision 1 of NEI 07-02.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.

Enclosed is the staff's safety evaluation (SE) which defines the basis for acceptance of NEI 07-02, Revision 3. The NRC staff finds that for combined license applications, NEI 07-02, Revision 3, provides an acceptable template for assuring that structures, systems, and components within the scope of the Maintenance Rule 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 Combined License 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 and the enclosed 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/

Stephanie M. Coffin, Chief
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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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 ML072190335), 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 ML072600275) 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 has verified that NEI 07-02, Revision 3, complies with the following regulations and regulatory guidance:

- 10 CFR Part 52, Subpart C, "Combined Licenses"
- 10 CFR 50.65, "Requirements For Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"
- RG 1.206, "Combined License Applications for Nuclear Power Plants"

- 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”
- NUREG-0800, “Standard Review Plan,” Section 17.6

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 (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.” 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, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.” 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.

10 CFR 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. DRAP 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]

[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 this future NUMARC 93-01 will be addressed in a new revision to Regulatory Guide 1.160, which will then supersede Regulatory Guide 1.182.

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

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 position is that implementation of an acceptable MR Program may occur in advance of the Commission's § 52.103(g) finding, with components being monitored or tracked as they become available. In such cases, a COL applicant referencing NEI 07-02 must supplement its application MRPD to include identification of the milestone for such early implementation of its MR Program. Therefore, the NRC Staff is conditioning approval of NEI 07-02, as explained in Section 4.1 below.

4.0 ANALYSIS

A direct comparison of the criteria for the MRPD, as provided in the review documents identified in section 2, above was made to NEI 07-02. NEI 07-02 was found to closely correspond to the organization and text of Regulatory Guide 1.206 and found to be in compliance with the specific criteria presented in the Standard Review Plan with one exception. As identified in NUREG 0800, Section 17.6, III.1.A, 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". As any such activities would most likely occur in advance of the fuel load (and the Commission's § 52.103(g) finding), program

implementation would necessarily also need to occur prior to fuel load. The MRPD will need to be supplemented by the COL applicant to address this alternative, early use of the MR Program. Section 4.1, condition 1, addresses early program implementation.

4.1 Conditions: Maintenance Rule Program Implementation

10 CFR 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.

However, a licensee may choose to implement its MR Program before the regulatory milestone contained in 10 CFR 50.65(a). For example, a licensee may choose to implement its MR Program as SSCs become available, in order to ensure that ITAAC continue to be met between the time that ITAAC determinations are made, pursuant to § 52.99, and issuance of the Commission's § 52.103(g) finding. A COL applicant that intends to implement its MR Program at any time prior to the regulatory milestone contained in § 50.65(a), 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. In addition, a COL applicant that chooses to use its MR Program to ensure that ITAAC continue to be met between the time that ITAAC determinations are made and issuance of the Commission's § 52.103(g) finding, must supplement NEI 07-02 by fully describing how the implementation of the MR Program will ensure the continued validity of ITAAC determinations.

Accordingly, the NRC's endorsement of NEI 07-02 for use by COL applicants is conditioned as follows:

(1) 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;

(2) If a COL applicant plans to rely upon implementation of its MR Program to ensure the continued validity of ITAAC determinations, then the COL applicant must describe how the MR Program accomplishes that objective in its application; and

(3) If a COL applicant determines that additional SSC functions may be added or subtracted prior to fuel load (and the Commission's § 52.103(g) finding), the COL MRPD will need to be supplemented to include this contingency within the scope of the MR Program. Condition 1 also applies.

Potential COL applicants should also 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 addition, each COL will include a license condition requiring the licensee to notify the NRC when each operational program listed in Section C.IV.4 is implemented.

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, the Staff finds that, if the conditions described above are adequately addressed, incorporation of NEI 07-02 by reference in a COL application provides 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

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