



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 1, 1996

Mr. Thomas E. Tipton, Vice President
Operations and Engineering
Nuclear Energy Institute
Suite 400 1776 I Street, NW
Washington, DC 20006-3708

SUBJECT: NRC COMMENTS ON NEI 96-03, REVISION D, "GUIDELINE FOR MONITORING THE
CONDITION OF STRUCTURES AT NUCLEAR POWER PLANTS"

Dear Mr. Tipton:

By letter dated July 16, 1996, the Nuclear Energy Institute submitted NEI 96-03, Revision D, "Industry Guideline for Monitoring the Condition of Structures at Nuclear Power Plants," for NRC staff review. The staff has completed its review and believes that in conjunction with NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," this document, with the resolution of the concerns discussed in the attachment, would serve a useful purpose for developing maintenance monitoring programs for structures. However, the current version of NEI 96-03 is not acceptable for use under the license renewal rule because the document lacks specific details in areas applicable to license renewal such as detecting, identifying, and managing aging effects. Examples of specific issues that need to be resolved for license renewal are also included in the attachment.

In view of the different regulatory requirements and implementation schedules for the maintenance rule and the license renewal rule, NEI should consider developing a separate guideline to specifically address the monitoring of the condition of structures for license renewal. This approach may be more prudent than having a single guideline for both the maintenance rule and the license renewal rule.

Attached are the staff comments on NEI 96-03, Revision D. If you have any questions, please contact Peter Wen at 415-2832.

Sincerely,

for *DB Matthews*

Thomas T. Martin, Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Project No. 689

Attachment: NRC Comments on NEI 96-03, Rev. D

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NRC COMMENTS ON NEI 96-03, REV. D
"GUIDELINE FOR MONITORING THE CONDITION OF
STRUCTURES AT NUCLEAR POWER PLANTS"

General Comments

Although the maintenance rule and the license renewal rule are similar in scope, and aspects of the maintenance rule may satisfy some requirements of the license renewal rule, the requirements of the license renewal rule go beyond the requirements of the maintenance rule. For example, the license renewal rule requires that licensees identify relevant aging effects and demonstrate that they will be adequately managed to maintain the current licensing basis throughout the extended life of the plant. The staff found that Revision D of NEI 96-03 lacks specific details in areas applicable to license renewal such as detecting, identifying, and managing aging effects. Therefore, the staff is unable to consider endorsing this document, in its current form, for the license renewal application.

In view of the different regulatory requirements and implementation schedules for the maintenance rule and the license renewal rule, developing a separate guideline to specifically address the adequacy of structures for license renewal at nuclear power plants may be more prudent than the current combined approach to have a single guideline for both the maintenance rule and the license renewal rule. This separate document could supplement the general license renewal guidance in NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 - the License Renewal Rule." The document should clearly address (a) the methods and programs used to manage degradation of the structures; and (b) additional evaluations of time-dependent attributes for the structures, where applicable, and actions taken to ensure the extended life of the structures. The evaluations should include (a) discovery technique, (b) acceptance criteria, (c) corrective actions, and (d) documentation. The results of the programs developed to monitor the effectiveness of maintenance of the structures under the maintenance rule could also be useful in addressing these issues.

Specific Comments

1. Section 1.0, "Background": To emphasize a need for monitoring the condition of structures, this section should, at a minimum, discuss the existing known condition of structures subjected to adverse environments (e.g., intake structures and pump-house structures). Though the regulatory requirements may be quoted as the principal driving forces for developing the guideline document, NEI should mention the examples from the available database that prompted the development of the document.

The above comment was made during a review of Revision C of NEI 96-03 at the June 17, 1996, meeting but was not incorporated in the current revised document. It is necessary to emphasize that structures are vulnerable to environmental degradation, as pointed out in NUREG-1522, and need proper maintenance to ensure their satisfactory performance when challenged.

2. Section 2.0, "Purpose and Scope": The document in its current form will not meet the requirements of license renewal. It does not contain enough information such as those addressed in Section 4.2 of NEI 95-10 regarding aging management of structures. (License Renewal)
3. Section 2.1, "Regulatory Application and Scope": Certain maintenance rule scoping criteria in 10 CFR 50.65 (b) (nonsafety related systems, structures, and components that are relied upon to mitigate accidents or transients or are used in plant emergency operating procedures) were not included in the current revised document.
4. Section 3.0, "Program for Monitoring the Condition of Structures": Before the last sentence, add "For license renewal, the baselining should be performed so that it provides assessment or trending records, to ensure that the structure can perform its intended function(s) during extended periods of operation." (License Renewal)
5. Section 3.1, "Identification of Structures": To be consistent with the license renewal rule, in the second paragraph, change "The function of the structure should" to "The function of the structure must" (License Renewal)
6. Section 3.2, "Responsibilities": In the first sentence, change "may" to "should." This comment was made during a review of Revision C of NEI 96-03 at the June 17, 1996, meeting but was not incorporated in the current revised document.
7. Section 3.3, "Examination Guidance": The staff has no comments regarding the maintenance issue. For the license renewal issue, address the following:
 - a. Page 4 - Delete the phrase "primary visual examination."
 - b. Page 4 - Insert "plant-specific and industry operating experience," between "requirements," and "and" in the sentence beginning with "The degree of examination...."
 - c. Page 5, first paragraph - The next to last sentence should read, "Further action (as discussed below) including aging effects assessment may be...."
 - d. Page 5, first paragraph - The last sentence should be changed to "Types of structural components and associated degradations to be considered are:"
 - e. Page 5 - The second paragraph has to be written to apply to the license renewal rule. For license renewal, structural components, NOT the overall condition of structures, are to be assessed.

f. Page 5 - The following items should be added to the type of structural components and associated degradation:

- Prestressing Steel (Tendons)
 - Corrosion and Loss of Prestress
- Steel Liner Plate
 - Corrosion, Elevated Temperature, Stress Corrosion Cracking
- Reinforcing Steel (Rebar)
 - Loss of Bond due to Concrete Cracking or Spalling, Loss of Material, Loss of Strength and Modulus
- Embedment Steel
 - Improper Installation and Deterioration of the Embedded Concrete

g. Page 6 - Add the following to the end of the paragraph beginning with "Some structures may be inaccessible...." to be consistent with the newly approved ASME IWE/IWL rule on containment structure inspection: "Inaccessible areas should be examined when conditions exist in accessible areas that could indicate the presence of, or result in, degradation to such inaccessible areas."

8. Section 3.4. "Evaluation of Results". For the maintenance rule, address the following:

- a. Although this section describes the concept of classifying the condition of structures as either acceptable, acceptable with deficiencies, or unacceptable, it is not clear how this fits into the maintenance rule paradigm of (a)(1) & (a)(2). This comment was made during a review of Revision C of NEI 96-03 at the June 17, 1996 meeting but was not incorporated in the current revised document. This comment will need to be addressed either in this guideline (NEI 96-03) or in the next revision to NUMARC 93-01, or the staff will be unable to endorse NEI 96-03 as acceptable guidance for the maintenance rule purposes. To further support this concern, the lack of specific performance criteria for structures and clear guidance for placing structures in the (a)(1) or (a)(2) category was found to be a weakness during the first maintenance rule baseline inspection.

- b. Under "Unacceptable," the document states that an unacceptable safety-related structure should be classified as a functional failure under the maintenance rule. The term "safety-related" should be removed from this sentence to be consistent with the scope. Also, there should be some discussion as to what should constitute a "maintenance preventable" functional failure under the maintenance rule. This comment was made during a review of Revision C of NEI 96-03 at the June 17, 1996, meeting but was not incorporated in the current revised document. This comment will need to be addressed either in this guideline (NEI 96-03) or in the next revision to NUMARC 93-01.

For the license renewal rule, address the following:

- c. Page 6 - Replace the sentence beginning "Acceptance criteria should..." with the sentence "The program should contain acceptance criteria against which the need for corrective action will be evaluated, and ensures that timely corrective action will be taken when these acceptance criteria are not met."
- d. Page 6 - To be consistent with the license renewal rule, add "under CLB design conditions" after the word "functions," and revise the first sentence of the three paragraphs under "Acceptable," "Acceptable with deficiencies," and "Unacceptable," as follows:

"Acceptable structures are capable of performing their intended functions under CLB design conditions."

"Structures which are acceptable with deficiencies are those which are capable of performing their intended functions under CLB design conditions."

"Unacceptable structures are those which are damaged or degraded such that they are not capable of performing their intended functions under CLB design conditions."
- e. Page 7 - Delete the last two sentences, "Because of the robust design and construction methods employed in nuclear power plants it would take extreme environmental conditions or many years of neglect for this stage to appear. Early detection, review and repair of deficient conditions can preclude reaching this failure state."

Additional comments for Section 3.4:

Consensus standards are developed to bring safe practices and consistency to the activities related to design, construction, and inservice inspection of structures. The existence of a standard would reduce the need to rely on judgment. The staff recommends that the option to rely on judgment rather than use Section 3.3 and codes and standards for evaluation be deleted.

9. Section 3.5, "Corrective Actions": For license renewal, rewrite the first sentence as follows:

"...taken, documented, confirmed, and tracked to ensure that the corrective action taken was effective and the structures can perform their intended function."

10. Section 3.6, "Frequency, Trending and Industry Data": When applicable, frequency of examination and inspection should be in accordance with the regulatory requirements. For example, the frequency for examination of containments should be in accordance with 10 CFR 50.55a (which endorses Subsections IWE and IWL of ASME Section XI).

For the license renewal rule, address the following:

- a. Page 7 - Insert the following as the third sentence of the first paragraph: "The frequency is to be selected so that the aging effects would be detected before there is a loss of intended function of the structure under CLB design conditions."
 - b. Page 7 - It is not clear how the aging effects of structures would be monitored and managed for the period of extended operation.
11. Section 4, "List of References": Subsections IWE and IWL should be separately listed with their respective titles.

Additional comments on Section 4:

- a. Page 9 - In the 8th reference the correct NUREG number, that is, "NUREG-1557(to be issued)" should be given rather than "NUREG/CR-????."
 - b. Page 9 - In the 4th reference, NEI 95-10, Revision 0 should be added.
12. Appendix A, "Definitions":
- a. Page A-1 - Acceptance criteria should be defined as follows: "Standard against which, inspection results, monitoring results, or observation are measured in order to evaluate whether systems, structures, or components meet established requirements for performance. The standard shall be predetermined (e.g., in an existing code) or pre-established in maintenance or aging management programs."
 - b. Page A-1 - The last two definitions do not apply to license renewal. License renewal requires the maintenance of CLB explicitly.

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Attached are the staff comments on NEI 96-03, Revision D. If you have any questions, please contact Peter Wen at 415-2832.

Sincerely,

David B. Matthews/for

Thomas T. Martin, Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Project No. 689

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