



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

August 4, 1997

50-269
270
287

Mr. William R. McCollum, Jr.
Vice President, Oconee Site
Duke Power Company
P. O. Box 1439
Seneca, South Carolina 27679

SUBJECT: LICENSE RENEWAL STRUCTURAL AND ELECTRICAL EXAMPLE REVIEWS FOR
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 (TAC NOS. M99144,
M99145, M99095, M99096, M99097, M99098, M99099, M99100)

Dear Mr. McCollum:

By letter dated June 10, 1997, Duke Power requested that the staff review the structural and electrical license renewal application examples provided by Duke as handouts at the June 3, 1997, meeting with the Nuclear Regulatory Commission (NRC) staff (Attachments 3 and 7 to the NRC meeting summary dated June 26, 1997). The letter indicated that the primary objective of the review was to determine the level of detail required for a license renewal application. A list of specific areas was identified in the letter for each example for which feedback was requested. The results of the staff's review and the response to your requests are contained in the Attachment.

The NRC staff's review focused on the format and content to determine if a complete submittal, following the form of the example, would contain sufficient information for the staff to begin its technical review. A comprehensive review to determine the completeness or technical adequacy of the examples was not performed based on the type of feedback requested by Duke and the schedule for completing the review. However, during its review the staff identified a number of technical questions that are included in the Attachment. These questions are being provided to illustrate the type of information and level of detail expected in future submittals to help minimize the number of staff questions needed when a review of the complete submittals is performed.

Subject to the comments in the Attachment, the staff believes that the examples provide the type of information that if provided for the complete submittal, should result in submittals with format and content sufficient for

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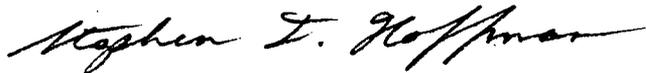


W. McCollum

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the staff to begin a technical review. Duke is requested to inform the staff of its anticipated schedule for submitting the remaining technical sections of its license renewal report.

Sincerely,



Stephen T. Hoffman, Senior Project Manager
License Renewal Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270
and 50-287

Attachment: As Stated

cc w/encl: See next page
R. L. Gill, Duke Power

Oconee Nuclear Station
Units 1, 2, and 3

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NRC STAFF COMMENTS ON OCONEE
ELECTRICAL AND STRUCTURAL EXAMPLES

Following are NRC staff comments on the Duke examples provided for electrical Sections 2.6 and 3.6 and the structural Sections 2.7 and 3.7 of the Oconee License Renewal Technical Information Topical Report, OLRP-1001, as requested in Duke's letter dated June 10, 1997. Although the staff did not perform a technical review, a number of technical questions were identified during its assessment of the examples and are included for consideration.

Electrical/Instrumentation & Control Components Example
OLRP-1001, Sections 2.6 and 3.6

Duke Topic No.

1. The completeness of the list of electrical component groups subject to aging management review as shown in Section 2.6 of the example and the adequacy of the process used to develop the list.

Format and Content

The list of electrical components as presented in the text of Section 2.6 and the Tables 2.6-1 through 2.6-4 are provided in a format such that the staff would be able to begin its review if submitted in an application. The staff did not for the purposes of this exercise review the tables or the text to determine if the information constitutes a comprehensive list of all Oconee electrical components to be addressed for license renewal.

The process described in Section 2.6 appears to have the elements necessary to generate a comprehensive list of electrical components subject to an aging management review. However, it is not entirely clear when the component type "screen" is performed. The first paragraph of Section 2.6 indicates that the first step of the process is to identify component groups and the second step is to identify component types. The second paragraph of Section 2.6 states that the first step of the process is to determine component types.

Technical Comment

A number of electrical components in Appendix B of NEI 95-10, Revision 0, were not classified as to whether they require an aging management review. Duke should review Appendix B Item Numbers 68, 122, 139, 140, 143, and 144, as well as fuses and indicating lights, and provide the bases for those components that are not subject to an aging management review.

2. The completeness of the list of Oconee structures and areas which contain all electrical components within scope as given in Section 2.6 of the meeting handout.

Format and Content

The list of structures and areas containing electrical components as presented in the text of Section 2.6 and Table 2.6-5 are provided in a format such that the staff would be able to begin its review if submitted in an application. The staff did not for the purposes of this exercise review the tables or the text to determine if the information constitutes a comprehensive list of all Oconee structures to be addressed for license renewal.

A discussion of the evaluation boundary as it relates to the electrical components in each structure or area should be provided in the application for the staff to complete its review.

3. The adequacy of the listing reference for electrical penetrations as given in Section 2.6.3 of the meeting handout.

Format and Content

Because electrical penetration assemblies (EPAs) are within the scope of 10 CFR 50.49 and will be reviewed for renewal as time-limited aging analyses (TLAAs), it is acceptable in Section 2.6 to reference Section 3.6.9 (TLAAs) where the EPAs will be addressed. However, any EPAs which are not within the scope of 10 CFR 50.49 should be addressed in Section 2.6. Additionally, a general description of the design of each type of EPA should be provided in Section 2.6, consistent with the descriptions for other components evaluated.

4. The adequacy of the detail given in Section 2.6.4 regarding insulators.

Format and Content

The level of detail in Section 2.6.4 which describes the station post and strain/suspension insulators that are within the scope of license renewal and subject to aging management review is sufficient for the staff to begin its review if submitted in an application.

5. The adequacy of the type of information provided in Tables 2.6-2, 2.6-3, 2.6-4, and 2.6-5 in order to meet the requirements of 10 CFR 54.21(a)(1).

Format and Content

The information provided in Tables 2.6-3, 2.6-4, and 2.6-5 to meet the requirements of 10 CFR 54.21(a)(i) is sufficient for the staff to begin its review if submitted in an application.

Technical Comment

In Table 2.6-2 (Types of Insulated Cable), the staff recommends that additional information be included such as the cable supplier and a description of the cable jacket and cable insulation material. For example:

Rockbestos: 30 mil Firewall Silicone Rubber Insulation, Fiberglass Braided Jacket, 16 AWG, 1/C, 600V

Okonite: Okonite Okolon, 30 mil EPR Insulation, 15 mil CSPE Jacket, 12 AWG, 1/C, 600V

Brand Rex: 30 mil XLPE Insulation, 60 mil CSPE Jacket, 12 AWG, 3/C, 600V

Anaconda: Anaconda Flame-Guard EP, 30 mil EPR Insulation, 15 mil Individual CSPE Jackets, 45 mil Overall CSPE Jacket, 12 AWG, 3/C, 600 V

6. The adequacy of the aging management review provided in Section 3.6.7.3.

Format and Content

The aging management review of insulators in Section 3.6.7.3 has a sufficient level of detail for the staff to begin a review of the applicable aging effects and the operating experience associated with the insulators. However, because Duke states that no aging management program is necessary for the insulators during the period of extended operation, the staff was unable to comment on the adequacy of an aging management program for electrical components.

To assist the staff's review, a brief synopsis of the conditions leading to the aging effect that occurred affecting insulators from that "specific manufacturer" should be provided and information regarding the service environment (alluded to in Section 3.6) should also be included with the application (service environment for the insulators might also be addressed in Section 2.6.4).

Technical Comment

Cracking of the porcelain due to cement growth or physical contact was the only aging effect identified for porcelain insulators. The buildup of contamination on the porcelain insulators (dust, dirt, etc.) that can result in arc-over during wet conditions should also be evaluated in Section 3.6.7.3 as a potential aging effect.

7. The adequacy of the time-limited aging analysis discussion provided in Section 3.6.9.

Format and Content

The staff reviewed the environmental qualification (EQ) examples in Section 3.6.9 that were identified as TLAAs for Oconee. In general, the level of detail presented for the Okonite EPR/Neoprene cables and Viking electrical penetration assemblies was adequate for the staff to begin its review. However, a more detailed review of the onsite EQ documentation by the staff to support review of an application would be necessary.

To assist the staff's review, references should be provided for the original analyses and the analyses performed to support the license renewal review.

Technical Comments

Section 3.6.9 did not discuss GSI-168 (Environmental Qualification of Electrical Equipment). An application needs to address this issue in terms of identifying the Oconee approach that will be used to satisfy the finding required by §54.29.

The qualified life for both the Okonite EPR/Neoprene cables and the Viking electrical penetration assemblies is stated to be greater than 60-years based on a review of the original analysis. Further, the analysis assumes an ambient temperature of 120 degrees F. The variation in ambient temperature due to daily, seasonal, or operational effects can affect the thermal aging of these components and thus, needs to be discussed in terms of demonstrating that the service limiting temperature of these components never exceeded 120 degrees F in order to substantiate the Arrhenius analysis which predicts a 60-year qualified life.

General Comment

The title for Sections 2.6 and 3.6, "Electrical Components," is not consistent with the table of contents for OLRP-1001 which includes "Instrumentation & Control Components."

Structures and Structural Components Example
OLRP-1001, Sections 2.7 & 3.7

Duke Topic No.

1. The completeness of the list of structural components provided in Section 2.7, including Tables 2.7-1 through 2.7-9.

Format and Content

The list of structural components presented in the text of Section 2.7 and Tables 2.7-1 through 2.7-9 are provided in a format such that the staff would be able to begin its review if submitted in an application. The staff did not for the purposes of this exercise review the tables or the text to determine if the information constitutes a comprehensive list of all Oconee structural components to be addressed for license renewal.

Commodity grouping of like structures or components appeared to be used in Tables 2.7-1 through 2.7-9. The basis for grouping structures or components should be provided.

The evaluation boundary for each Oconee structure within the scope of license renewal needs to be described to clearly indicate which portions are inside and outside of the evaluation boundary. Consider the use of drawings or sketches to describe the boundaries.

Technical Comment

Foundations and foundation mats which are structural components are not addressed in Section 2.7 tables.

2. The completeness of the functions (structures and structural component) as listed at the end of each table in Section 2.7.

Format and Content

The list of structural component functions as presented in the text of Section 2.7 and the Tables 2.7-1 through 2.7-9 are provided in a format such that the staff would be able to begin its review if submitted in an application. The staff did not for the purposes of this exercise review the text or tables to determine if the information constitutes a comprehensive list of all Oconee structural functions to be addressed for license renewal.

3. The completeness of the description of the earthen embankments.

Format and Content

The descriptions provided in the text for the earthen embankments contain, in general, sufficient information for staff to begin a review if submitted in an application. However, a discussion of the evaluation

boundary for the embankments is not provided. Diagrams or maps of the structural configuration and location would assist the staff in completing its review (a UFSAR reference may also be acceptable).

Technical Comment

Sections 2.7.2.1 and 2.7.2.4 indicate that both the intake canal dike and the underwater weir are designed to have an adequate factor of safety under the same conditions of seismic loadings as used for the design of Oconee. The information or references to information should be provided that determine the adequate factor of safety under the same conditions of seismic loadings as used for the design.

4. The completeness of the description of the applicable aging effects for the earthen embankments.

Format and Content

The descriptions of the applicable aging effects provide a sufficient level of the detail for the staff to begin a review of an application. Although the descriptions of the aging effects are acceptable to begin review, additional discussion that establishes the tie between the aging effect and the structure's intended function should be provided.

Technical Comments

Section 3.7.2.1.1.3, second paragraph, states that desiccation is not an applicable aging effect for these structures. The staff believes that desiccation is an applicable aging mechanism for these structures that is managed by the ground cover vegetation.

Section 3.7.2.1.1.4 discusses industry experience associated with dam incidents. It states that the majority of the incidents (eighty-four) were identified as repairs that were required because of deterioration or to update certain features. The cause of the incidents were due to piping, sliding, overtopping, or deficiency in the construction or design of the dam/foundation/spillway. A discussion should be provided as to whether the Oconee earthen embankments experienced any degradation or required repairs in the past associated with the aforementioned problems.

5. The adequacy of the demonstration of the effectiveness of the credited aging management programs described in Section 3.7.

Format and Content

Section 3.7 provides the aging management reviews and demonstrations for Oconee earthen embankments that are under the regulatory oversight of the Federal Energy Regulatory Commission (FERC). The staff is currently investigating the scope of FERC's oversight of these structures and the extent that credit can be given to the FERC programs as aging management programs for compliance with 10 CFR Part 54. Upon completion, the staff

may request additional information regarding these structures. However, the level of detail provided in Section 3.7 is adequate for the staff to begin a review if submitted in an application.

6. The adequacy of the time-limited aging analyses discussion provided in Section 3.7.11.

Format and Content

The discussion provided in Section 3.7.11 on the polar and spent fuel pool crane TLAAs appears to contain the type of information and level of detail necessary for the staff to begin a review of an application.

General Comment

Use of references in Sections 2.7 and 3.7 appeared to be inconsistent. Some documents were simply referenced without giving specific sections (e.g., references used on pages 3, 4, 5, and 9 through 12 of section 3.7). In other cases, specific sections of documents were referenced (e.g. references used on page 3 of Section 2.7 and page 1 of Section 3.7). Whenever appropriate and practical, the applicable sections of the document should be provided.

W. McCollum

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the staff to begin a technical review. Duke is requested to inform the staff of its anticipated schedule for submitting the remaining technical sections of its license renewal report.

Sincerely,

Original signed by:

Stephen T. Hoffman, Senior Project Manager
License Renewal Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270
and 50-287

Attachment: As Stated

cc w/encl: See next page
R. L. Gill, Duke Power

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