November 18, 1998

Mr. William R. McCollum, Jr.
Vice President, Oconee Nuclear Site
Duke Energy Corporation
P. O. Box 1439
Seneca, SC 29679

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3, LICENSE RENEWAL APPLICATION

Dear Mr. McCollum:

By letter dated July 6, 1998, Duke Energy Corporation (Duke) submitted for the Nuclear Regulatory Commission's (NRC's) review an application pursuant to 10 CFR Part 54, to renew the operating licenses for the Oconee Nuclear Station (Oconee), Units 1, 2, and 3. Exhibit A to the application is the Oconee Nuclear Station License Renewal Technical Information Report (OLRP-1001), which contains the technical information required by 10 CFR Part 54. The NRC staff is reviewing the information contained in OLRP-1001 and has identified, in the enclosure, areas where additional information is needed to complete its review. Specifically, the enclosed questions are from the Mechanical Engineering Branch regarding the following Sections of OLRP-1001: 3.4.7, 3.4.8, 3.4.10, 3.5.3, and 3.5.14.

Please provide a schedule by letter, electronic mail, or telephonically for the submittal of your responses within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with Duke prior to the submittal of the responses to provide clarifications of the staff's requests for additional information.

Sincerely, /original signed by/

Joseph M. Sebrosky, 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
Enclosure: Request for Additional Information
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REQUEST FOR ADDITIONAL INFORMATION
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3
LICENSE RENEWAL APPLICATION, EXHIBIT A

OLRP-1001 Section No.

3.4.7 Once through Steam Generator

3.4.7-1 It is stated in Section 3.4.7.1 of the license renewal application that the once through steam generator (SG) is designed to accommodate all service loadings (i.e., Levels A through D); however, operation under Levels A and B service conditions contribute to the normal aging stresses for the once through SG items. The Oconee units have not been subjected to Levels C or D events. It is the staff's understanding that the tubes in Oconee Unit 3 were subjected to stresses slightly beyond the allowable values during an event in August 1994 involving the injection of cold feedwater into a hot, dry SG. Discuss whether or not this event contributed to the aging of the SG tubes. Describe the procedures that are used to evaluate the impact of such events on the adequacy of aging management programs.

3.4.7-2 It is stated in Section 3.4.7.2.3 of the license renewal application that mechanical distortion is an applicable aging effect for the once through SG. The installation of sleeves in the SG tubes cause a distortion of the tube at the expansion joint of the sleeve. The increased stress in the tube makes it susceptible to circumferential cracking at this location. Discuss whether current measures to manage this aging effect during plant operation are considered adequate and sufficient to manage anticipated further aging during the extended period of operation of the SGs. If additional measures are planned to deal with this aging mechanism during the license renewal period, we request that you identify and discuss such measures in detail.

3.4.7-3 It is stated in Section 3.4.7.2.1 of the license renewal application that fretting and sliding wear of SG tubes at the tube support locations has occurred in the industry. The forces imposed on the tubes by the secondary fluid cause high frequency vibration of the tubes and interaction with the tube support structures. The degradation of the supports due to loss of material can result in excessive vibration and eventual failure of the tubes due to fatigue or fluid elastic instability. Discuss whether current measures to manage this aging effect during plant operation are considered adequate and sufficient to manage potential further aging during the extended period of operation of the SGs. If additional measures are planned to deal with this aging mechanism during the license renewal period, we request that you identify and discuss such measures in detail.

3.4.8 Reactor Coolant Pumps

3.4.8-1 It is stated in Section 3.4.8.3, page 3.4.22 of the license renewal application that the results of the review of NRC generic communications for the Reactor Coolant System piping report (BAW-2243A, Demonstration of the Management of Aging Effects for the Reactor Coolant Piping) are also applicable to the reactor coolant

pump (RCP). Identify the parts of the RCP for which fatigue is considered plausible. Describe the review process used to evaluate these parts for fatigue.

3.4.8-2 Identify any subcomponents of the RCP for which fatigue usage is monitored. Also, describe how the monitored parameters are compared to the fatigue analysis of record.

3.4.8-3 Identify any modifications in the RCP or other components that may have had an impact on the fatigue usage of the subcomponents of the RCP. Also, describe the impact of the modification, if any, on the computation of previous fatigue usage and projection of fatigue usage to 60 years.

3.4.10 Letdown Coolers

3.4.10-1 It is stated in Section 3.4.10.4 of the license renewal application that during a reactor trip, the increased flow through the letdown cooler caused severe thermal and vibrational stresses on the tubes that eventually caused the tubes to crack. Two of the letdown coolers have been replaced and the other four have been repaired and the operating procedures have been changed. Describe the repairs which were performed on the damaged letdown coolers. Also, describe the specific analyses which were performed to assure that thermal and vibrational stresses during normal and off-normal operation will not cause fatigue failure during the projected period of operation.

3.4.10-2 Describe the specific maintenance and inspection activities which are performed on the letdown coolers to manage fatigue damage due to excessive vibrational stresses which might occur during off-normal operation.

3.4.10-3 Indicate whether or not the fatigue evaluation of the letdown cooler subcomponents was performed by treating it as a separate mechanism or in combination with other age-related degradation mechanisms such as corrosion and fouling.

3.4.10-4 Identify any modifications of the letdown coolers or related components which may have an impact on the projected fatigue usage of the subcomponents of the letdown coolers during the extended period of operation.

3.5.3 Containment Heat Removal

3.5.3-1 Identify any portions of the Containment Heat Removal System piping within the scope of license renewal that are not designed to withstand the effects of a design basis earthquake. Clarify the piping segments within the category of "Seismic II over I" (a non-seismic Category I system, structure or component whose failure could cause loss of safety function of a seismic Category I system, structure, or component) that are included within Oconee's current licensing basis and would be subject to aging management review. Additionally, clarify which aging management program will address these structures and components and specifically discuss implementation of the program for these segments of piping systems to manage applicable aging effects during the period of extended operation.

3.5.3-2 Thermal fatigue has not been identified as an applicable aging effect for the components of the Containment Heat Removal System. Identify the Code Class requirements for which these components were designed. Also, discuss the engineering analysis for this system including the specific design temperatures, operating conditions, and thermal cycles, which were used in the analysis to make the determination that the assumption of less than 7000 cycles is valid for all locations during the extended period of operation.

3.5.14 Standby Shutdown Facility Mechanical Components

3.5.14-1 It is stated in Section 3.5.14.1.1 of the license renewal application that no aging effects have been identified for this system. The diesel exhaust system is exposed to an exhaust gas environment. At some facilities, the structures at the exit of the diesel exhaust system have degraded over a period of time due to impingement of the hot corrosive exhaust gases. The debris from these degraded structures has the potential of blocking the exhaust system and rendering the diesel inoperable during an emergency. Discuss the potential for similar degradation at the Oconee nuclear station during the extended period of operation.

3.5.14-2 It is stated in Section 2.5.14.5 of the license renewal application that the reactor coolant makeup system piping is designated as Oconee Class B and that it is designed to USAS B31.7, Class II requirements. Discuss the engineering analysis for this system including the specific design temperatures, operating conditions, and thermal cycles, which were used in the analysis to make the determination that assumptions of less than 7000 cycles are valid for all locations during the extended period of operation.

3.5.14-3 It is stated in Section 2.4.14.8 of the license renewal application that no applicable aging effects have been identified for the components of the starting air system. The diesel generator starting air system at several other facilities has experienced degradation due to excessive vibration in the piping and starting air valves which in some cases rendered the air receivers incapable of delivering starting air to the diesel engines at the design pressures. Discuss the upgrades, if any, and/or surveillance requirements for the starting air system at Oconee to assure operability of this system during the extended period of operation beyond 40 years.

3.5.14-4 Section 2.5.14 of the license renewal application indicates that some portions of the Standby Shutdown Facility piping within the scope of license renewal are not designed to withstand the effects of a design basis earthquake. Clarify the piping segments within the category of "Seismic II over I" (a non-seismic Category I system, structure or component whose failure could cause loss of safety function of a seismic Category I system, structure, or component) that are included within Oconee's current licensing basis and would be subject to aging management review. Additionally, clarify which aging management program will address these structures and components and specifically discuss implementation of the program for these segments of piping systems to manage the applicable aging effects during the period of extended operation.