ACRSR-1846

September 13, 1999

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Dr. Travers:

SUBJECT: INTERIM LETTER RELATED TO THE LICENSE RENEWAL OF OCONEE NUCLEAR STATION

During the 465th meeting of the Advisory Committee on Reactor Safeguards, September 1-3, 1999, we reviewed the NRC staff's Safety Evaluation Report (SER) Related to the License Renewal of Oconee Nuclear Station, Units 1, 2 and 3. Our Subcommittee on Plant License Renewal also reviewed this matter on June 30 - July 1, 1999. During our reviews, we had the benefit of discussions with representatives of the NRC staff and the Duke Energy Corporation (Duke) and of the documents referenced.

Here we make a number of recommendations that are generic to the license renewal process. These recommendations are listed separately from the conclusions that are specific to the Oconee application.

Conclusions

1. The staff performed an extensive and thorough review of the Oconee license renewal application. Notwithstanding a number of open issues and confirmatory items yet to be resolved, Duke has developed and implemented adequate processes to identify structures, systems, and components (SSCs) at Oconee, Units 1, 2 and 3 that are subject to an aging management review and will be able to demonstrate that aging-induced degradation will be adequately managed during the period of extended operation.

2. We concur with the staff assessment that the Babcock and Wilcox Owners Group's topical report BAW-2251, "Demonstration of the Management of Aging Effects for Reactor Vessel," provides both an acceptable demonstration that aging effects will be adequately managed and an acceptable evaluation of time-limited aging analyses.

Recommendations Generic to License Renewal Process

1. We believe that determination of the design-basis accidents and other accidents that define SSCs within the scope of 10 CFR Part 54 is a generic issue for older plants licensed before NUREG-75/087, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), was issued in September 1975. Additional guidance needs to be developed for this determination.

2. We agree with the staff and industry that additional research and experience are needed to determine the significance of void swelling as a potential mode of degradation for pressurized water reactor internals. Because of the uncertainties, we believe that a focused inspection program as suggested by the staff is a prudent approach for this aging management issue.

3. One-time inspections for evidence of additional plausible modes of degradation for which there is no current experience will be most useful if performed late in the current licensing period. We agree with this strategy and recommend that the staff develop relevant guidance for future applicants.

4. Although updating the supplement to the Final Safety Analysis Report (FSAR) prior to approving the license renewal application is not required by Part 54, we believe that this should be done and recommend that a requirement for updating the supplement to the FSAR be considered in any future revision to Part 54.

5. Active components such as fuses, which are replaced easily, should not be included in the scope of Part 54.

Discussion

On July 6, 1998, Duke submitted the license renewal application for Oconee in accordance with Part 54. Duke requested renewal of the operating licenses for the three Oconee units for a period of 20 years beyond the current license expiration dates of February 6, 2013, for Unit 1; October 6, 2013, for Unit 2; and July 19, 2014, for Unit 3.

The SER documents the results of the staff's review of information submitted to the NRC through May 10, 1999. The staff's review included the verification of the completeness of the identification and categorization of the SSCs considered in the application; the validation of the integrated plant assessment process; the identification of the possible aging mechanisms associated with each passive long-lived component; and the adequacy of the aging management programs. The staff also conducted onsite inspections to verify the adequacy of the implementation of the programs described in the application. The staff's review of the license renewal application for Oconee was extensive and thorough.

The Oconee license renewal application incorporated by reference several Babcock and Wilcox Owners Group topical reports. We have reviewed the staff's safety evaluation of topical report BAW-2251. The staff's safety evaluation was thorough. We concur with the conclusion that BAW-2251 provides both an adequate demonstration that aging effects will be managed and an acceptable evaluation of time-limited aging analyses.

Duke has a robust reactor vessel surveillance program with surveillance materials sufficient for 60 years of operation and, thus, is well prepared to manage vessel embrittlement. Based on the best current data from the compositions of the limiting welds, Duke projected that Oconee, Units 1, 2 and 3 reactor pressure vessels will reach the pressurized thermal shock (PTS) screening limit after 60 years of operation. Duke has also updated the time-limiting aging analysis for flaw growth for 60 years of operation.

In the process of identifying plant SSCs within the scope of Part 54, Duke recognized, as with other plants licensed prior to the staff's issuance of the SRP, that the safety-related SSCs at Oconee do not completely bound the set of SSCs that are relied upon to be functional during and following design basis events. Consequently, nonsafety-related components, which are relied upon to perform safety-related functions, are within the scope of Part 54. In order to properly scope these SSCs, Duke considered 58 possible design basis events that included the 20 design basis events from the Oconee FSAR, but determined that only 26 events in total were needed for the purpose of scoping SSCs within Part 54.

Based on the limited number of initiating events considered, the staff identified the scoping process as an open item. This scoping issue is not unique to Oconee and must be addressed for all plants licensed before the issuance of the SRP. Additional guidance for identifying the complete set of events that define SSCs within the scope of Part 54 should be developed as part of revising the draft Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants.

Even for plants licensed after the issuance of the SRP, additional guidance is needed to address the issues of adequacy and completeness of the set of SSCs within the scope of Part 54. Risk informing the scope of Part 54 may add risk-significant SSCs that are not identified by the current deterministic process. It may also make the implementation of Part 54 more efficient by removing SSCs that are not risk significant.

To address the concern with void swelling of baffle/former assembly components of the Oconee units, Duke has endorsed the industry position developed in the Electric Power Research Institute (EPRI) Technical Report TR-107521, "Generic License Renewal Technical Issues Summary." It is concluded in this report that void swelling of austenitic stainless steel is insignificant for the license renewal term, especially for plants using the low-leakage fuel loading pattern. It is also stated in this report that given the uncertainties involved in predicting the eventual amount of void swelling for the most affected internal components, it would be prudent for industry to follow or participate in research activities associated with this issue. We agree that additional research is needed.

We believe that it is premature to conclude that void swelling will not be a significant issue during the license renewal period. We agree with the staff position on this issue, that either the applicant needs to provide more convincing justification that void swelling will not be an issue or develop an aging management program perhaps based on focused inspections of some critical components.

As in the case of the Calvert Cliffs Nuclear Power Plant, current regulatory requirements and licensee programs appear to provide adequate management of aging-induced degradation for most components in the scope of Part 54. Duke identified 11 new programs and modified 11 existing programs that are needed for Oconee license renewal. Several of these new or modified programs consist of one-time inspections for possible modes of degradation for which there is no current experience. These inspections are to be performed before completion of the current license term. Such inspections will be most useful if they are done as late in the current licensing period as possible. The staff should develop guidance on this issue for future applicants.

The staff is responsible for verifying that the licensee incorporates commitments made in the license renewal application into the licensing basis. As part of its license renewal application,

Duke prepared a proposed supplement to the FSAR that identified changes to the FSAR, including the addition of a new chapter concerning license renewal commitments. Duke may update this supplement prior to NRC approval of the license renewal application. We agree with this approach. Although updating of the FSAR supplement prior to the approval of the license renewal application is not required by Part 54, we believe that this should be done and that a requirement for this should be considered in any future revision of Part 54.

In its review of license renewal issue No. 98-0016, "Aging Management Review of Fuses," the staff considered potential aging mechanisms that may prevent fuses from performing their safety-related fault protection function. The staff agreed with the Nuclear Energy Institute position that fuses should be treated as active components and thus should be excluded from the scope of Part 54. We also agree that fuses should be excluded from the scope of Part 54.

ACRS member Mr. John D. Sieber did not participate in the Committee's deliberations regarding this matter.

ACRS member Dr. William J. Shack did not participate in the Committee's deliberations on aging-induced degradation.

Sincerely,

/s/

Dana A. Powers
Chairman

References:

1. Letter dated July 6, 1998, from M. S. Tuckman, Duke Energy Corporation, to U. S. Nuclear Regulatory Commission Document Control Desk, Subject: Oconee Nuclear Station, Units 1, 2, and 3 - Application for Renewed Operating Licenses.
2. Letter dated June 16, 1999, from David B. Matthews, Office of Nuclear Reactor Regulation, NRC, to William R. McCollum, Jr., Duke Energy Corporation, Subject: Oconee Nuclear Station, Units 1, 2, and 3, License Renewal Safety Evaluation Report.
3. Letter dated June 27, 1996, from D. K. Croneberger, B&W Owners Group, to Document Control Desk, NRC, Subject: Submittal of BAW-2251, "Demonstration of the Management of Aging Effects for the Reactor Vessel," June 1996.
4. Letter dated April 26, 1999, from Christopher I. Grimes, Office of Nuclear Reactor Regulation, to David J. Firth, The B&W Owners Group, Subject: Acceptance for Referencing of Generic License Renewal Program Topical Report Entitled, "Demonstration of the Management of Aging Effects for the Reactor Vessel," BAW-2251, June 1996.
5. Office of Nuclear Reactor Regulation, Office Letter Transmittal, to All NRR Employees, Subject: NRR Office Letter No. 805, "License Renewal Application Review Process," approved June 19, 1998.
6. Argonne National Laboratory, M. C. Billone, Preliminary Assessment and List of Queries for Task Order No. 13 (JCN J-2076), "Review of Void Swelling of Reactor Internals for License Renewal," received July 23, 1999 (Predecisional).
7. U. S. Nuclear Regulatory Commission, "Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants," Working Draft, September 1997.