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AUTH.NAME AUTHOR AFFILIATION
MCCOLLUM,W.R. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION
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SUBJECT: Provides clarification to NRC Info Notice 99-10.Licensee requests that suppl to subject notice be issued to correct public record.

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Duke Energy

W. R. McCollum, Jr.
Vice President

Duke Energy Corporation
Oconee Nuclear Station
P.O. Box 1439
Seneca, SC 29679
(864) 885-3107 OFFICE
(864) 885-3564 FAX

May 6, 1999

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Document Control Desk

Subject: Oconee Nuclear Station
Docket Numbers 50-269, 270, and 287
Clarification to NRC Information Notice 99-10 and
Request for Supplement

The NRC issued Information Notice (IN) 99-10, *Degradation of Prestressing Tendon Systems in Prestressed Concrete Containments*, on April 13, 1999. Two attachments to IN 99-10 discuss two occurrences related to Oconee Nuclear Station prestressing system degradations. Attachment 1 correctly relates the staff's observations during the April, 1998 NRC inspection and Duke's disposition of those observations. However, Attachment 3 provides an incorrect summary of the findings and corrective actions of the sixth tendon surveillance on Oconee Unit 3 in the summer of 1995. The closing sentences of the paragraph appear to have been inadvertently copied from the end of the first paragraph in Attachment 1. The first paragraph in Attachment 1 discusses tendon surveillance at Calvert Cliffs Nuclear Power Plant, Unit 1. A clarification of the Oconee Unit 3 tendon surveillance is provided in Attachment 1 to this letter.

Accordingly, Duke requests that a supplement to IN 99-10 be issued to correct the public record. Attachment 2 to this letter contains Duke's suggested deletions and additions to a revised Attachment 3 of IN 99-10.

If there are any questions, you may contact Debbie Ramsey at (704) 382-3920.

Very truly yours,

A001

W. R. McCollum, Jr., Vice President
Oconee Nuclear Site

cc: Mr. D. E. LaBarge, Project Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop O-14 H25
Washington, D. C. 20555

Mr. L. A. Reyes, Regional Administrator
U. S. Nuclear Regulatory Commission - Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

M. A. Scott
Senior Resident Inspector
Oconee Nuclear Station

Virgil R. Autry, Director
Division of Radioactive Waste Management
Bureau of Land and Waste Management
Department of Health & Environmental Control
2600 Bull Street
Columbia, SC 29201

Attachment 1
Oconee Nuclear Station
Clarification to NRC Information Notice 99-10

As noted in Attachment 3 to IN 99-10, Comparison and Trending of Prestressing Forces, Duke Power Company performed the sixth tendon surveillance on Oconee Unit 3 in the summer of 1995. A report of that inspection was submitted to the NRC in a letter dated October 11, 1995. No wire breakage or vertical tendon degradation was identified in the report.

The NRC requested additional information related to the tendon surveillance in a letter dated January 19, 1996. As part of that request, Duke Power was asked to reanalyze lift-off data, plot lift-off data, perform a regression analysis for each group of tendons, and indicate whether Oconee planed to adopt a random tendon selection process.

In response to the request for additional information, Duke Power provided supplemental information in letters dated March 14, July 10, and October 3, 1996. Duke Power performed a reanalysis and determined that the projected dome tendon force of Unit 3 would be below the minimum required value (MRV) at 8 years after the structural integrity test (SIT) of the containment structure. As requested by the NRC staff, Duke Power also performed a reanalysis for Units 1 and 2, and found that the vertical tendon forces in Unit 1 will be below the MRV at year 30 after the SIT and that Unit 2 vertical tendon forces will be below the MRV about 10 years after the SIT.

As noted in the NRC letter to Duke Energy dated November 7, 1996, a potential source of the low tendon forces may have been the repeated use of the same tendons for surveillance (Previous inspections had tested the same preselected tendons). As part of Duke's corrective actions, Oconee performed a state-of-the-art containment structure reanalysis to establish more accurate MRVs and prescribed lower limits (PLLs) for each tendon group.

Attachment 1
Oconee Nuclear Station
Clarification to NRC Information Notice 99-10

The reanalysis of the containment structure was addressed in a Duke letter to the NRC dated July 31, 1997. The reanalysis was completed and new MRVs and PLLs for each tendon group were identified in Oconee UFSAR Chapter 16, Selected Licensee (SLC) 16.6.2, Appendix 16.6-2, Figures 1, 2, and 3. Copies of these figures were provided to the NRC in a letter dated September 23, 1997. Subsequent inspections, performing a Regulatory Guide 1.35 type surveillance, concluded that the tendon forces remained above the MRV for each tendon group.

Also as part of its corrective actions identified in the March 14, 1996 letter, Duke committed to use random tendon selection during subsequent inspections. Oconee's response indicated that a random tendon selection for the next tendon surveillance would be implemented in accordance with Regulatory Guide 1.35. The response also recognized that Oconee would be required to comply with provisions of ASME Subsection IWL in the future. ASME Subsection IWL would require random tendon selection for future surveillance. Duke Power plans to conduct tendon surveillance in accordance with Subsection IWL following the Oconee Unit 2 tendon surveillance scheduled in late 1999.

Attachment 2
Oconee Nuclear Station
Clarification to NRC Information Notice 99-10
Proposed Changes to Attachment 3

The following page is the marked-up copy of Page 1 of 2 of Attachment 3. This page identifies the sentences that should be deleted from the discussion of the Oconee Unit 3 tendon surveillance. [The last five sentences of the paragraph should be deleted starting with the sentence "These results were caused by additional wire breakage…"]

The following conclusion should be added to the paragraph:

As part of the licensee's corrective action, the licensee performed a reanalysis of the containment structure using state-of-the-art analysis techniques and committed to random tendon selection for future tendon surveillance. [Reference Duke Power's letters to the NRC dated March 14, July 10, and October 3, 1996 and July 31, 1997.] Subsequent inspections, performing a Regulatory Guide 1.35 type surveillance, concluded that the tendon forces remained above the MRV for each tendon group.

Attachment 2
Markup Copy

Comparison and Trending of Prestressing Forces

In 1994, during the 20th-year tendon surveillance of Three Mile Island Nuclear Station, Unit 1 (TMI-1), prestressed concrete containment (conforming to Regulatory Guide [RG] 1.35 [Revision 3]) and TMI-1 Technical Specifications, the licensee, General Public Utilities Nuclear Corporation, subjected a total of 11 tendons (5 hoop, 3 vertical, and 3 dome) to lift-off testing. On the basis of the data from this lift-off testing, in conjunction with data from the previous surveillance tests for each group of tendons, the licensee originally performed a trending analysis for each group of tendons and concluded that none of the tendon groups would go below each group's minimum required force during the 40-year plant life. However, the licensee subsequently performed a linear regression analysis using individual lift-off forces rather than the average of the lift-off forces and found that the hoop tendons would go below the minimum required force beginning in the 25th year.

The licensee of the Oconee Nuclear Station, Duke Power Company, performed the sixth tendon surveillance on Oconee Unit 3 in the summer of 1995. The licensee, using the averages of the lift-off forces obtained to that date, plotted them on a graph on which the predicted upper bound and lower bound are shown and concluded that the mean lift-off force for each group fell below the required values (i.e., the lower bound). A subsequent trending analysis on the basis of individual lift-off forces indicated that the dome tendon force began to go below the minimum required force about 8 years after the structural integrity test (SIT). For other tendon groups in Unit 3, the tendon forces were not predicted to go below the minimum required value until 40 years or more after the SIT. Since Oconee Units 1 and 2 are identical to Oconee Unit 3, the licensee performed a trend analysis for each of these units and found that the vertical tendon forces in Unit 1 and Unit 2 were predicted to go below the minimum value at 30 years and 10 years after the SIT, respectively. ~~These results were caused by additional wire breakage of other vertical tendons. The licensee expanded the lift-off testing and visual examination to 100 percent of the vertical tendons. Similar degradation of other vertical tendons was found. As a part of the licensee's corrective action, the licensee used the same tendons for lift-off testing, thus subjecting the tendons to cyclic loading. A more appropriate methodology is the random selection of tendons to be tested.~~ **As part of the licensee's corrective action, the licensee performed a reanalysis of the containment structure using state-of-the-art analysis techniques and committed to random tendon selection for future tendon surveillance. Subsequent inspections, performing a Regulatory Guide 1.35 type surveillance, concluded that the tendon forces remained above the MRV for each tendon group.**

In 1996, the V. C. Summer licensee, South Carolina Electric & Gas Co., performed the 15-year (fifth) tendon surveillance. For each group of tendons, the licensee used the averages of the lift-off forces from each surveillance and plotted the five points from the five surveillances on a graph. The five points are joined by line segments. On the basis of this graph, the licensee concluded that the tendon force levels in the three groups of tendons would be acceptable beyond the 20-year surveillance. A subsequent linear regression analysis using individual lift-off forces, instead of the averages, indicated that the dome and hoop tendons would not go below the minimum required forces until 32 years after the SIT. The vertical tendons that had been retensioned were predicted not to go below the minimum required force until 42 years after the SIT.