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82 OCT 26 A 8, 1982

Mr. James P. O'Reilly, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 3100  
Atlanta, Georgia 30303

Subject: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287

Dear Sir:

This submittal supplements our previous responses regarding IE Bulletin 79-14 and addresses the areas identified in Inspection Report Number 82-18 of the Oconee Nuclear Station. Attachment 1 completes our submittal of all technical requirements of IE Bulletin 79-14. Attachment 2 contains a detailed explanation of the site modification work remaining and the scheduled completion date. Duke Power Company is committed to completing the modifications as soon as is reasonably possible and has completed 41 percent of the total modifications required (5781). However, the sheer volume of work remaining precludes completion of all outstanding modifications prior to March 31, 1985. Duke Power Company will complete the modifications by that date and will notify you of completion.

Very truly yours,

*Hal B. Tucker*  
Hal B. Tucker

JFN/php  
Attachment

cc: Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Mr. Philip C. Wagner  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Mr. W. T. Orders  
NRC Resident Inspector  
Oconee Nuclear Station

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Attachment 1

OCONEE NUCLEAR STATION

USNRC IE Bulletin 79-14, Revision 1, Supplement 1, Supplement 2

Update to Responses

October 1, 1982

The following is a summary, by item, of the extent and manner in which Duke Power Company intends to satisfy Actions 1 through 4 of IE Bulletin 79-14, Revision 1, Supplements 1 and 2.

- Response 1: Duke Power Company submitted a response to Item 1 on August 1, 1979.<sup>1</sup>
- Response 2: Duke Power Company submitted an updated response to Item 2 on June 11, 1980.<sup>6</sup> This summary completed our response to Item 2.
- Response 3: Duke Power Company submitted an updated response to Item 3 on June 11, 1980.<sup>6</sup> This summary completed our response to Item 3.
- Response 4: On June 11, 1980, Duke Power Company submitted an updated response to items 2 and 3 of IE Bulletin 79-14. In addition to the description of the seismic input nonconformances identified during the site inspections, an evaluation of the effect of each nonconformance upon system operability under specified earthquake loadings was provided as required by Item 4A of the bulletin. There has been no change to that summary.

After a review of the information obtained from the site surveillance and the original analysis and design documents contained in our files, it was decided to reanalyze approximately 100% of the piping stress analysis problems and approximately 100% of the pipe supports. During this reanalysis, modifications were specified as required to assure that the piping and the pipe supports conform to the requirements and design allowables described in the Oconee Nuclear Station Final Safety Analysis Report. This reanalysis and modification work is intended to satisfy the requirements of Items 4B, 4C, and 4D of the subject Bulletin. The reanalysis work commenced as soon as the first completed system information package was transmitted to the Design Engineering Department from the Oconee Site Surveillance Organization. This reanalysis work is now complete and all required modification packages have been sent to the site. The reanalysis effort involved 303 piping analysis models and 8168 pipe supports. Modifications are being

made to 5561 of these pipe supports, with approximately 50% of these modifications being classified as minor adjustments of spring or snubber settings, adjustments of U-Bolts or other support gaps, installation of teflon pads or other minor revisions; approximately 20% of the modifications involving removing existing supports and erecting new supports at different locations; and the remainder involving modifications to existing supports required due to the reanalysis results.

All piping and pipe support design documents are being revised to reflect the as-built conditions in the plants as required by item 4D. In addition, two procedural changes were made to provide assurance that future modifications and all associated design documents and analysis calculations are in agreement. First, detailed procedures were established to provide for an as-built verification of all Nuclear Safety Related/seismic piping and pipe supports. Second, detailed procedures were established to assure that all Nuclear Safety Related/seismic pipe supports which are removed and reinstalled during maintenance are reinspected against the design drawings.

Not all of the inspections required by the bulletin could be performed due to high radiation considerations. These areas are very limited and involve only nine pipe supports on Unit 1, zero on Unit 2 and 35 on Unit 3. Documentation of the reasons for the inaccessibilities is maintained at the plant. In order to justify omitting these supports from the inspection program, an evaluation was performed which substantiated system operability in the absence of these supports. Those supports that contained expansion anchors and were omitted from the IE Bulletin 79-02 inspection program due to high radiation or Mechanical interferences were included with these supports in the operability evaluation.

During several inspections conducted in our offices by Mr. W. P. Ang of the USNRC Region II, the subject of the structural overlap technique utilized in our pipe stress analysis was reviewed. Duke Power Company committed to provide a complete description of the technique used and also to provide a benchmark of the technique against the McGuire Nuclear Station and NUREG 51357 techniques. The practice of overlapping analysis problems was used in the original analytical work performed for the Oconee Nuclear Station piping systems. This approach was utilized to avoid erecting in-line pipe anchors for the sole purpose of defining piping analysis problems, a design practice which Duke Power Company considers to be undesirable. In the reanalysis work required for IE Bulletin 79-14, every effort was made to reduce the number of problems with overlap regions. This was done by combining individual analysis problems into one larger problem. However, this could not be accomplished for all problems due to computer capacity limitations. Of the 303 total analysis problems, only fifteen problems have overlap regions in each unit.

The original overlap criteria required only a minimum of one common effective three-way restraint in each problem. During the IE Bulletin 79-14 reanalysis effort the following overlap criteria was utilized:

When it is necessary to separate analysis problems in-between equipment, the models will be "overlapped" to obtain adequate boundary conditions. The overlap region (pipe modeled in both problems) shall be selected based on engineering judgement, considering the specific geometry to be modeled, to give acceptably accurate results at the problem boundary. As a minimum, the overlap region must include five effective restraints in each of three orthogonal directions. One axial restraint is effective for the entire run between changes of direction. The overlap region should be located in the most rigid portion of the pipe to obtain maximum isolation between problems.

In the overlap region, S/R loads from both problems will be enveloped to obtain a conservative design load.

The overlap criteria utilized in the reanalysis effort satisfies all of the requirements of the McGuire criteria. With respect to the requirements of NUREG 51357, Duke Power Company's overlap criteria exceeds the specified four rigid restraints on each of three mutually perpendicular direction, indeed the overlap regions average nine (9) rigid restraints in each of the three perpendicular directions. The overlap regions are generally selected based on their rigidity and tend to be the most rigid adjacent spans in each analysis problem. The average fundamental frequency of the overlap regions is at least twenty-five (25) percent higher than the frequency of the highest significant spectral acceleration. The envelope spectrum of the spectra associated with the boundaries of each separate analysis problem was used. In twenty-five (25) percent of the overlap regions, this envelope spectrum was the same for both analysis problems. The remaining overlap regions tend to be isolated by many additional supports from significant increases in elevation. The envelope of the pipe support forces from each analysis problem were used in the analysis of the pipe supports in the overlap region. Duke Power Company believes that the overlap criteria utilized satisfies the intent of the NUREG.

1. Letter dated August 1, 1979 from Mr. W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
2. Letter dated October 29, 1979 from Mr. W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
3. Letter dated November 6, 1979 from Mr. W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
4. Letter dated December 7, 1979 from Mr. W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
5. Letter dated January 24, 1980 from Mr. W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
6. Letter dated June 11, 1980 from Mr. W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
7. Letter dated October 16, 1981 from Mr. A. C. Thies, (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.
8. Letter dated February 2, 1982 from W. O. Parker, Jr., (Duke Power Company) to Mr. J. P. O'Reilly, USNRC, Region II.

Attachment 2

Oconee Nuclear Station  
IE Bulletin 79-14 Modification Schedule

Outlined below are the total number of hanger modifications by area, the estimated man-hours required to complete the modifications in each area, and the total number of weeks required for three experienced 12-man crews working 40 hours per week to complete the work.

<u>Area</u>	<u>Total No. Hangers Remaining</u>	<u>Total Est. Man-Hours</u>	<u>Total No. of Weeks</u>
Unit 1 Rx. Building	279	13,392	9
Auxiliary Building and Turbine Building	1,138	54,624	38
Unit 2 Rx. Building	286	13,728	10
Auxiliary Building and Turbine Building	903	43,344	30
Unit 3 Rx. Building	0	0	0
Auxiliary Building and Turbine Building	808	38,784	27
TOTALS	3,414	163,872	114

These figures are based on experiencing no problems, delays, interference, or additions. Due to priority modifications required at McGuire Nuclear Station, Oconee crews have been shifted to McGuire to complete those modifications (currently scheduled for January 15, 1983). Thus, with 114 weeks of work remaining and Oconee work resumption scheduled on January 15, 1983, all modifications cannot be completed prior to March 31, 1985.