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SUBJECT: Responds to NRC 980811 RAI re how util response to GL 97-04 related to reactor bldg overpressure compares to current licensing basis.

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September 17, 1998

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20655

Subject: Oconee Nuclear Station, Units 1, 2, and 3
Docket Nos. 50-269, 270, and 287
TAC Nos. MA0017, MA0018, and MA0019
Response to Request for Additional Information
Related to Generic Letter 97-04, dated August 11, 1998

On October 7, 1997, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps," which requested licensees to submit information necessary to confirm the adequacy of the net positive suction head available (NPSHa) for emergency core cooling and containment heat removal pumps. Duke Energy Corporation (Duke) provided Oconee's response to GL 97-04 on January 5, 1998.

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On August 11, 1998, the NRC issued a request for additional information related to Duke's response to GL 97-04 for Oconee Nuclear Station, Units 1, 2, and 3. The NRC staff requested a response be provided by September 18, 1998, discussing how Duke's response to GL 97-04 related to reactor building (RB) overpressure compares to the current licensing basis. This letter provides the requested information.

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Original Net Positive Suction Head Requirements

On May 5, 1972, Duke filed Amendment No. 31 to its Application for License for the Oconee Nuclear Station. This submittal provided Revision 19 to the Oconee Final Safety Analysis Report (FSAR) which included a description of the evaluation used to establish minimum NPSH for the low pressure injection (LPI) and reactor building spray (RBS)

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pumps. The referenced analysis addressed two cases. One case took credit for reactor building pressure, and the other assumed the reactor building total pressure was equal to the saturation pressure of the sump water. The referenced analysis demonstrated that the NPSHa was greater than the required NPSH (NPSHr) for the RBS and LPI pumps for both cases.

On July 6, 1973, the NRC issued a Safety Evaluation for Oconee Nuclear Station, Units 2 and 3. This Safety Evaluation contained the original licensing basis for the NPSHa for the RBS pumps. The Safety Evaluation contained the following statements:

1) in Section 7.1.5, "... the applicant used the Oconee "as-built" configuration, sizes, layouts, etc., and made assumptions based on both credit for reactor building pressure and no credit for reactor building pressure (saturation pressure of sump water);"

2) in Section 7.1.5, "In all cases for the low pressure injection pumps, the available NPSH exceeded the required NPSH for the worst case assumptions of maximum sump temperature and no credit for building pressure;" and

3) in Section 7.2, "The staff requested that the applicant provide analysis in the FSAR to justify that the containment spray pumps have adequate net positive suction head. This analysis was performed with the analysis for the ECCS pumps described in Section 7.1.5 and the results were the same."

The NRC Safety Evaluation for Oconee Nuclear Station, Unit 1, and its Supplements are silent regarding the assumptions that were utilized in the NPSH calculations for the LPI and RBS pumps.

Oconee Nuclear Station Units 1, 2, and 3 did not commit to meet the recommendations of Regulatory Guide (RG) 1.1.

Revised Net Positive Suction Head Requirements

Since Revision 19 to the FSAR was issued, Duke modified the NPSH requirements for the RBS pumps as a result of revised calculations which utilized different assumptions and methodology than the analysis discussed in Revision 19 to the FSAR. The response to GL 97-04 was based on revision 2 to OSC-4467, "RB Pressure Needed for RBS Operation."

Duke is currently processing a revision to the calculation. A spectrum of scenarios were evaluated to ensure the worst case bounding conditions for the NPSH analysis were considered. In all cases, the NPSH analysis showed that the NPSHa exceeded the required NPSH (NPSHr) for all sump temperatures for the reactor building spray (RBS) pumps, given the available minimum RB overpressure. It concludes:

> For Units 1 and 2, that approximately 1.5 psig of RB overpressure is needed from approximately 3000 seconds (i.e., the time that pump suction is transferred to the sump) to approximately 30,000 seconds following the onset of the loss of coolant accident (LOCA).
>
> For Unit 3, that approximately 2.0 psig of RB overpressure is needed from approximately 3000 seconds to approximately 28,000 seconds following the onset of the LOCA.

Duke's reactor building (RB) response analysis contains modeling assumptions and input parameters that tend to minimize the predicted RB pressure and maximize the RB sump temperature following a Loss of Coolant Accident (LOCA), thereby providing conservatism in how much overpressure can be credited for available net positive suction head (NPSHa).

Comparison of Licensing Basis to Revised NPSH Analyses

Following receipt of the NRC's letter dated August 11, 1998, Duke reviewed its position to determine if Oconee Nuclear Station Units 1, 2, and 3 were operating within their licensing basis regarding NPSH for the RBS and LPI pumps.

Historically, Duke believed its licensing basis only required the ability to demonstrate that the NPSHa was greater than the required NPSH for the RBS pumps. Duke did not believe it was prohibited from crediting RB overpressure, as long as the RB overpressure needed to assure adequate NPSH for the RBS pumps was less than the minimum predicted RB pressure based on conservative analysis. The rationale for this belief was:

1) Duke believed that the precedent had been set to utilize RB overpressure if needed to assure adequate NPSH. This belief was based on the fact that the original UFSAR contained a summary of an NPSH analysis which addressed cases with and without RB overpressure. This analysis was referenced in the NRC's Safety Evaluation dated July 6, 1973; and

2) Oconee Units 1, 2, and 3 were not licensed to Regulatory Guide 1.1.

Following the review, Duke concluded that utilizing a limited RB overpressure to assure adequate NPSH available to the RBS pumps was not within the licensing basis. Thus, it was concluded an unreviewed safety question (USQ) may exist. As a result, this condition was reported to the NRC in accordance with 10 CFR 50.72. Additional information regarding this issue is described in licensee event report 50—269/98-11 submitted on September 17, 1998.

An operability assessment was performed which concluded that Oconee possessed reasonable assurance that adequate NPSH would be provided to satisfy the requirements of the RBS pumps for all design basis LOCAs. Thus, Duke concluded that the RBS System for all three units is operable.

RB overpressure is not needed to demonstrate adequate NPSHa for the LPI pumps.

By October 2, 1998, Duke will submit a license amendment request to permit RB overpressure to be credited in the calculation of the NPSHa for the RBS pumps. Additionally, Duke is performing additional analyses to determine if additional margin can be established regarding the RBS NPSH

requirements. A supplement to the license amendment request may be needed at a later time to reflect the additional analyses.

Should you have questions or need additional information, please contact J. E. Burchfield, Jr., at (864) 885-3292.

Very truly yours,

WR McCollum

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