

February 29, 2000

Mr. H. B. Barron  
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Mr. G. R. Peterson  
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SUBJECT: MCGUIRE NUCLEAR STATION AND CATAWBA NUCLEAR STATION  
RE: REVIEW OF TOPICAL REPORT DPC-NE-3004-PA, REV. 1, REGARDING  
PROPOSED FINER NODALIZATION OF ICE CONDENSER (TAC NOS. MA5511,  
MA5512, MA5517, AND MA5518)

Gentlemen:

By letter dated May 20, 1999, Duke Energy Corporation (DEC) proposed a revision to its Topical Report DPC-NE-3004, "Mass and Energy Release and Containment Response Methodology," Revision 0. Revision 1 provides a finer nodalization of the ice condenser region in the ice condenser containment to support an upcoming technical specification amendment request for McGuire Nuclear Station, dealing with non-uniform distribution of the ice weight. The DEC's submittal and the enclosed NRC's safety evaluation apply to both the McGuire and Catawba facilities.

The staff has reviewed the information provided by DEC and finds that the revision proposed by the licensee is acceptable. This completes our review under TAC Nos. MA5511, MA5512, MA5417 and MA5418. If you have any questions regarding this transmittal, please contact Frank Rinaldi at (301) 415-1447 or Chandu Patel at (301) 415-3025.

Sincerely,

**/RA/**

Frank Rinaldi, Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

**/RA/**

Chandu P. Patel, Project Manager, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-369, 50-370, 50-413 and 50-414

Enclosure: As stated

cc w/encl: See next page

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Docket Nos. 50-369, 50-370, 50-413 and 50-414

Distribution: See next page

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATING TO THE DYNAMIC ROD WORTH MEASUREMENT TECHNIQUE  
DUKE ENERGY CORPORATION  
MCGUIRE NUCLEAR STATION UNITS 1 AND 2 AND  
CATAWBA NUCLEAR STATION UNITS 1 AND 2  
DOCKET NOS. 50-369, 50-379, 50-413 AND 50-414

1.0 INTRODUCTION

By letter dated May 20, 1999, Duke Energy Corporation (DEC) submitted, in reference to McGuire and Catawba Nuclear Stations, Topical Report DPC-NE-3004-PA, Revision 1, "Mass and Energy Release and Containment Response Methodology," for staff review. Revision 1 modifies the nodalization scheme of the ice condenser region in Revision 0 of the report so that the thermal-hydraulic model described in Revision 0 can handle a non-uniform ice weight distribution in the ice bed. Revision 0 was reviewed and found acceptable by the staff for simulating the mass and energy releases and containment responses to loss-of-coolant accidents (LOCAs) and main-steam-line-breaks (MSLBs) for the McGuire and Catawba facilities in a Safety Evaluation dated September 6, 1995.

Revision 1 added Appendix A, "GOTHIC Ice Condenser Model With Finer Nodalization," to Revision 0, which describes a revised GOTHIC model for finer nodalization detail within the ice condenser region. This increased detail within the ice condenser region allows the modeling of an ice condenser with variation in the initial ice weights of sections of the ice condenser.

The staff reviewed the topical report and requested additional information in a telephone conference call held on October 14, 1999. Specifically, the staff requested clarification of the term "excessive" as it was used in Appendix A with respect to lower inlet door or drain junctions. It was not clear if the term "excessive" referred to the number of junctions, or if it was in reference to some other attribute for a junction. Further, the proposed nodalization could affect the code's ability to estimate the thermal-hydraulic response of the ice condenser. In order to conclude that the potential effects of the nodalization are acceptably small, the staff requested a comparison of the pressure and temperature response curves of the ice condenser containment that would show the effect of the finer nodalization.

Enclosure

DEC responded to the staff's request for additional information in a letter dated November 10, 1999. The response clarified the use of the term "excessive" to be in reference to the number of junctions used to model the ice condenser lower inlet doors and drains. This information resolved the staff's concern that "excessive" may have been used to refer to some other attribute of a junction (e.g., flow rates). The response also provided several examples of pressure and temperature curves that showed the effect of finer nodalization of the ice condenser. These response curves showed marginally small differences between the original and the finer nodalization schemes. Therefore, the staff concludes that it is acceptable to use the proposed finer nodalization in the analysis of ice condensers with non-uniform ice weight distributions. However, if the nodalization were to be changed significantly from what is described in Topical Report DPC-NE-3004-PA, Revision 1, the staff would need to assess the change before approving the use of the code.

In summary, the staff finds that the use of the proposed finer nodalization, as described in Topical Report DPC-NE-3004-PA, Revision 1, acceptable for licensing containment analyses dealing with non-uniform ice weight distribution.

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Date: February 29, 2000

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