



**Duke Power Company**  
*A Duke Energy Company*

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July 27, 2000

U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555-0001  
Attention: Document Control Desk

Subject: Duke Energy Corporation  
McGuire Nuclear Station, Units 1 and 2  
Docket Numbers 50-369 and 50-370  
Catawba Nuclear Station, Units 1 and 2  
Docket Numbers 50-413 and 50-414

License Amendment Request, Implementation of  
Best-Estimate Large Break Loss of Coolant  
Accident (LOCA) Analysis Methodology

References: 1) Letter, M. S. Tuckman (DEC) to U. S. Nuclear  
Regulatory Commission, "Implementation of Best-  
Estimate Large Break LOCA Methodology", dated  
April 10, 2000.

2) Letter, M. S. Tuckman (DEC) to U. S. Nuclear  
Regulatory Commission, "Implementation of Best-  
Estimate Large Break LOCA Methodology", dated  
April 17, 2000.

3) Letter, M. S. Tuckman (DEC) to U. S. Nuclear  
Regulatory Commission, "License Amendment  
Request, Implementation of Best-Estimate Large  
Break LOCA Analysis Methodology", dated June  
29, 2000.

In References 1 and 2, Duke Energy Corporation described  
the process that will be followed to implement the  
Westinghouse Best-Estimate Large Break LOCA Analysis  
Methodology for McGuire and Catawba Nuclear Stations. This  
process was also discussed in a meeting with the NRC at One  
White Flint on June 12, 2000 (refer to NRC meeting  
minutes). Within References 1 and 2, Duke stated that a  
summary of a composite plant analysis that bounds McGuire

A001

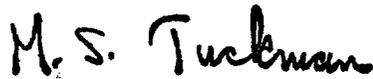
U. S. Nuclear Regulatory Commission  
July 27, 2000  
Page 2

Units 1 and 2 and Catawba Units 1 and 2 would be submitted in July 2000. The analysis has been completed and a summary of the results is provided in Attachment 1 to this letter.

In Reference 3, Duke submitted proposed license amendment requests (LAR) for McGuire and Catawba. Based on a July 26, 2000 telephone conversation with the NRC Project Manager for McGuire, Duke is submitting a revised No Significant Hazards Consideration Evaluation (NSHC) for the June 29, 2000 LAR. The original NSHC was included as Attachment 4 to the June 29 LAR, submitted pursuant to 10CFR50.90 and 10CFR50.92. The revised NSHC is herein included as Attachment 2 to this letter. Since Attachment 2 is a supplement to a previously submitted LAR, an affidavit is also included with this letter.

Please address any comments or questions regarding this matter to J. S. Warren at (704) 382-4986.

Very truly yours,



M. S. Tuckman

Attachments

U. S. Nuclear Regulatory Commission  
July 27, 2000  
Page 3

xc w/Attachments:

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McGuire Nuclear Station

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U. S. Nuclear Regulatory Commission  
July 27, 2000  
Page 4

Bxc w/Attachments:

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T. K. Pasour (2)  
J. S. Warren  
ELL

AFFIDAVIT

M. S. Tuckman, being duly sworn, states that he is the Executive Vice President of Duke Energy Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission revisions to the McGuire Nuclear Station Facility Operating Licenses Nos. NPF-9 and NPF-17, and the Catawba Nuclear Station Facility Operating Licenses Nos. NPF-35 and NPF-52; and that all the statements and matters set forth herein are true and correct to the best of his knowledge.

M. S. Tuckman

M. S. Tuckman, Executive Vice President

Subscribed and sworn to before me on this 27<sup>TH</sup> day of July, 2000.

Mary P. Nelson  
Notary Public

My Commission Expires:

JAN 22, 2001

SEAL

## Attachment 1

### Supplement to the License Amendment Request for Implementation of Best-Estimate Large Break LOCA Analysis for McGuire and Catawba Nuclear Stations

#### Description

This submittal provides supplemental information regarding the license amendment request for implementation of the Best-Estimate Large Break LOCA Analysis Methodology for the McGuire and Catawba Nuclear Stations.

#### Discussion

The proposed changes are being made to incorporate the best-estimate approach into the licensing basis for the McGuire and Catawba Nuclear Stations large break LOCA analyses in accordance with 10CFR50.46, Regulatory Guide 1.157, and the Westinghouse Topical Report WCAP-12945-P-A (Reference 1-1). Revisions to Section 15.6.5 of the McGuire and Catawba UFSARs will be made will be made under 10CFR50.59 after approval of the license amendment request is received, and implemented in accordance with 10CFR50.71(e). The peaking factors in the COLRs will also be updated via plant procedures.

Table 1-1 presents a summary of the best-estimate large break LOCA results for McGuire and Catawba Nuclear Stations. The results consist of the 50th and 95th percentile peak clad temperature (PCT), maximum cladding oxidation, maximum hydrogen generation, and core cooling results.

#### Conclusion

A best-estimate large break loss of coolant accident (LOCA) analysis has been performed for McGuire and Catawba Nuclear Stations using the approved Westinghouse best-estimate methodology contained in Reference 1-1. The selection of all plant specific parameters used in the analysis is consistent with the generic methodology. Therefore, the McGuire and Catawba composite analysis conforms to 10CFR50.46 and Section II of Appendix K, and meets the intent of Regulatory Guide 1.157.

The conclusions of the analysis are that there is a high level of probability that:

- 1) The calculated maximum fuel element cladding temperature (peak cladding temperature) will not exceed 2200 °F.
- 2) The calculated total oxidation of the cladding (maximum cladding oxidation) will no-where exceed 0.17 times the total cladding thickness before oxidation.
- 3) The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam (maximum hydrogen generation) will not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.
- 4) The calculated changes in core geometry are such that the core remains amenable to cooling.
- 5) After successful initial operation of the ECCS, the core temperature will be maintained at an acceptably low value and decay heat will be removed for the extended period of time required by the long-lived radioactivity remaining in the core.

Therefore, Duke Energy Corporation has concluded that implementing the best-estimate large break LOCA methodology for the McGuire and Catawba Nuclear Stations and making the proposed technical specification changes will not adversely affect the health and safety of the public.

#### References

- 1-1) WCAP-12945-P-A, Volume 1 (Revision 2) and Volumes 2 through 5 (Revision 1), "Code Qualification Document for Best-Estimate Loss-of-Coolant Accident Analysis," March 1998.
- 1-2) Letter, M. S. Tuckman (DEC) to U. S. Nuclear Regulatory Commission, "Implementation of Best-Estimate Large Break LOCA Methodology", dated April 10, 2000.

1-3) Letter, M. S. Tuckman (DEC) to U. S. Nuclear Regulatory Commission, "Implementation of Best-Estimate Large Break LOCA Methodology", dated April 17, 2000.

Table 1-1

McGuire/Catawba Composite  
 Best-Estimate Large Break LOCA Results

	<u>Value</u>	<u>Criteria</u>
50th Percentile PCT (°F) *	1512	N/A
95th Percentile PCT (°F) *	2028	≤ 2200
Maximum Cladding Oxidation (%)	10	≤ 17
Maximum Hydrogen Generation (%)	0.83	≤ 1
Coolable Geometry	Core remains coolable	Core remains coolable
Long Term Cooling	Core remains coolable	Core remains coolable

\* Transition core effects have been evaluated as described in References 1-2 and 1-3. The results indicate that transition cores are bounded by the full core results.

## Attachment 2

### Revised No Significant Hazards Consideration Evaluation for McGuire and Catawba Nuclear Stations

Pursuant to 10CFR50.92, Duke Energy Corporation has made the determination that this license amendment involves no significant hazards considerations by applying the standards established by NRC regulations in 10CFR50.92(c). This ensures that operation of the facility in accordance with the proposed amendment would not:

Involve a significant increase in the probability or consequence of an accident previously evaluated?

No. The proposed changes involve use of the Best-Estimate Large Break Loss of Coolant Accident (LOCA) Analysis Methodology and implementation of associated technical specifications changes. The plant conditions assumed in the analysis are bounded by the design conditions for all of the equipment in the plant. Therefore, there will be no increase in the probability of a LOCA. Additionally, the consequences of a LOCA are not being increased, since it has been demonstrated that the Emergency Core Cooling System performance conforms to the criteria contained in 10CFR50.46(b). No other accidents are potentially affected by this change.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Create the possibility of a new or different kind of accident from any accident previously evaluated?

No. The proposed changes to the technical specifications are to support implementation of Best-Estimate Large Break LOCA Analysis Methodology. There are no new modes of plant operation being introduced. The plant parameters assumed in the analysis are within the design limits of the existing plant equipment.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Involve a significant reduction in a margin of safety?

No. The analytic technique used in the analysis realistically describes the expected behavior of the McGuire/Catawba reactor system during a postulated LOCA. Uncertainties were accounted for as required by 10CFR50.46. A sufficient number of LOCA cases with different break sizes, different locations, and other variations in properties were analyzed to provide assurance that the most severe cases are calculated. It has been shown by the analysis that there is a high level of probability that all criteria contained in 10CFR50.46(b) are met.

Therefore the proposed amendment does not involve a significant reduction in any margin of safety.

Duke Energy Corporation has concluded, based on the above discussion, that there are no significant hazards considerations involved in this license amendment request.