Duke Energy

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

Subject: McGuire Nuclear Station
Docket Nos. 50-369, 370
Response To Request For Additional Information
Proposed Amendment To Technical Specification
3.3.2 - Engineered Safety Feature Actuation System
Instrumentation

By letter dated August 22, 2000, McGuire Nuclear Station submitted a license amendment request (LAR) for McGuire Nuclear Station Facility Operating Licenses NPF-9 and NPF-17, Appendix A, Technical Specifications. The subject LAR proposed a limitation on the amount of time that an inoperable Refueling Water Storage Tank level instrument could be placed in a trip condition. During a subsequent telephone conference, the NRC requested that MNS provide additional information to support NRC review of the LAR.

The additional information requested by the NRC and Duke Energy Corporation's response is provided in Attachment A to this letter.

Any questions related to this matter should be directed to Julius Bryant, McGuire Regulatory Compliance at (704) 875-4162.

H.B. Barron, Vice President
McGuire Nuclear Station

Attachments

A001

cc: L.A. Reyes, Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30323

Frank Finaldi, Project Manager
U.S. Nuclear Regulatory Commission
Office of Nuclear Power Regulation
Mail Stop 14H25
Washington, D.C. 20555

Scott Shaeffer
Senior Resident Inspector
McGuire Nuclear Station

H. B. Barron, being duly sworn, states that he is Site Vice President of McGuire Nuclear Station Duke Energy Corporation; that he is authorized on the part of Duke Energy Corporation to sign and file with the U.S. Nuclear Regulatory Commission this revision to the McGuire Nuclear Station Facility Operating License No.s NPF-9 and NPF-17; and, that all statements and matters set forth therein are true and correct to the best of his knowledge.

H B Barron

H. B. Barron, Vice President
McGuire Nuclear Station
Duke Energy Corporation

Subscribed and sworn to before me this 7th day of November 2000.

Deborah G. Throp
Notary Public
Deborah G. Throp

My Commission Expires:

4/6/2002

bxc: C. Cuthbertson (MG05SE)
ELL-EC050
Regulatory Compliance File
Master File
NSRB Support Staff (EC05N)

ATTACHMENT A

ADDITIONAL INFORMATION

Item #1

Provide Probabilistic Risk Assessment (PRA) data which supports the proposed 48 hour completion time for restoring an inoperable Refueling Water Storage Tank (RWST) level instrument channel to operable status.

Response To Item #1:

The requested information, which is contained in an approved Duke Energy Corporation PRA calculation, is provided below:

Evaluation of Allowed Outage Time (AOT)
for an RWST Level Channel in Trip

McGuire Nuclear Station

References:

1. SAAG 584, Evaluation of Bypassed vs. Tripped Condition for McGuire RWST Level Transmitters - Revision 1, 10/2/00

2. McGuire PRA Revision 2 Summary Report, December 1997

3. SAAG 342, SAROS Generic Equipment Failure Rate Database, 11/6/95

4. Memo to File, McGuire PRA Update (Rev. 2) Data Collection Process, 7/12/96

5. Regulatory Guide 1.177, An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications, August 1998

Statement of Problem:

Estimate the change in core damage frequency (CDF) for a range of AOTs for the case of one RWST level channel in the Trip condition based on other equipment failures that could allow a swap to a dry containment sump.

Equipment Failure Rate Data Source:

The failure rates used in the McGuire Revision 2 PRA are Bayesian Updates that are developed from combining generic data from Reference 3 and plant specific data gathered in Reference 4. The key equipment failure rates for this study are

Inverter fails: 2.85E-05/hr

Level transmitter fails: 4.6E-07/hr

Initiating Event Frequencies:

The initiating event frequencies of interest are Small, Medium, and Large LOCA frequencies. From Reference 1, these are 3.07E-03/yr, 1.2E-04/yr, and 1.2E-04/yr respectively for a total LOCA frequency of 3.3E-03/yr.

Assumptions:

1. The time frame for injection is conservatively estimated to be 2 hours.

2. No credit is taken for any operator recovery during the 2 hour time frame in question.

Failure Modes:

The following failure modes for a premature swap to a dry containment sump were considered:

1. One RWST channel in Trip, vital inverter fails allowing a second RWST channel to go to Trip condition during the 2 hour time period that a LOCA occurs.

2. One RWST channel in Trip, second channel fails low during the 2 hour time period that a LOCA occurs.

3. One RWST channel in Trip, spurious Safety Injection signal occurs, second RWST channel fails low.

Results:

Failure 3 was not considered further since additional failures would be needed, such as failure of secondary side heat removal, to lead to core damage.

A. Failure 1: The conditional increase in CDF associated with failure mode 1 can be estimated as follows:

dCDF = LOCA initiating frequency X failure probability of either of the two remaining inverters that power an RWST level transmitter

dCDF = 3.3E-03/yr X (2 inverters X 2.85E-05/hr X 2 hrs for injection)

dCDF = 3.8E-07/yr

Converting to a reactor year based on a 90% capacity factor gives the increase in CDF as

dCDF = 3.8E-07/yr / 0.9 = 4.2E-07/reactor yr

B. Failure 2: The conditional increase in CDF associated with failure mode 2 can be estimated as follows:

dCDF = LOCA initiating frequency X failure probability of either of the two remaining RWST level transmitters

dCDF = 3.3E-03/yr X (2 transmitters X 4.60E-07/hr X 2 hrs for injection)

dCDF = 6.1E-09/yr

Converting to a reactor year based on a 90% capacity factor gives the increase in CDF as

dCDF = 6.1E-09/yr / 0.9 = 6.8E-09/reactor yr

The overall conditional increase in CDF for these two failures becomes 4.3E-07/reactor yr. The incremental conditional core damage probability (ICCDP) can now be determined for a range of AOTs by multiplying the conditional change in CDF by the duration of the AOT under consideration. This is shown in the table below.

AOT Duration (hours)	ICCDP
24	1.2E-09
36	1.8E-09
48	2.4E-09
60	3.0E-09
72	3.5E-09
84	4.1E-09

From the table above it can be seen that with one RWST level transmitter in Trip, for an AOT of 48 hours, the ICCDP is estimated to be 2.4E-09. This change would therefore only have a small quantitative impact on plant risk.

Regulatory Guide 1.177 (Reference 5) states that "An ICCDP of less than 5.0E-07 is considered small for a single TS AOT change."