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A Duke Energy Company

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May 29, 2002

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

Subject: Duke Energy Corporation
Catawba Nuclear Station, Units 1 and 2
Docket Numbers 50-413 and 50-414
McGuire Nuclear Station, Units 1 and 2
Docket Numbers 50-369 and 50-370
Proposed Technical Specifications (TS) Amendments
Technical Specification 5.5.2 (Containment Leakage Rate Testing Program)
One-Time Extension of Integrated Leak Rate Testing (ILRT) Interval

Pursuant to 10 CFR 50.90, Duke Energy Corporation is requesting amendments to the Catawba and McGuire Nuclear Station Facility Operating Licenses and TS. These amendments will allow, on a one-time basis, extension of the interval governing the conduct of ILRT from ten to fifteen years. The amendments represent a one-time exception to the ten-year frequency of the performance-based Type A tests as delineated by Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," September 1995. The amendments, when approved, will allow conduct of each respective unit's ILRT within fifteen years from the last ILRT performed for each unit. The ILRT imposes significant expense on the units, while the safety benefit of performing it within ten years, as opposed to fifteen years, is minimal.

The contents of this amendment request package are as follows:

Attachments 1a and 1b provide marked copies of the affected TS pages for Catawba and McGuire, respectively, showing the proposed changes. Attachments 2a and 2b contain reprinted pages of the affected TS pages for Catawba and McGuire,

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respectively. Attachment 3 provides a description of the proposed changes and technical justification. Pursuant to 10 CFR 50.92, Attachment 4 documents the determination that the amendments contain No Significant Hazards Considerations. Pursuant to 10 CFR 51.22(c)(9), Attachment 5 provides the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement.

These license amendment requests have been developed based on, and are consistent with, the guidance contained in EPRI document TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Intervals." In addition, these requests are consistent with similar requests made by other utilities, some of which have already been reviewed and approved by the NRC. Duke Energy Corporation is therefore requesting that the NRC review and approve the enclosed license amendment requests no later than November 1, 2002.

Please note that for McGuire, a license amendment request was made on December 7, 2001 (transition to 10 CFR 50, Appendix J, Option B for Types B and C testing) which also affects a TS page enclosed in this license amendment request. Therefore, the two license amendment requests will need to be coordinated regarding the processing and approval of changes to this page. Duke Energy Corporation will submit any necessary revised TS pages resulting from NRC approval of this previous license amendment request.

Implementation of these amendments to the Catawba and McGuire Facility Operating Licenses and TS will not impact the respective station's Updated Final Safety Analysis Report (UFSAR).

Duke Energy Corporation has determined that the standard 30-day implementation period will be sufficient for these amendments.

In accordance with Duke Energy Corporation administrative procedures and the Quality Assurance Program Topical Report, the proposed amendments for each station have been previously reviewed and approved by the Catawba and McGuire Plant Operations Review Committee and on an overall basis by the Duke Energy Corporation Nuclear Safety Review Board.

Pursuant to 10 CFR 50.91, copies of these proposed amendments are being sent to the appropriate state officials.

There are no regulatory commitments contained in this letter or its attachments.

Inquiries on this matter should be directed to L.J. Rudy at (803) 831-3084.

Very truly yours,

K.S. Canady

LJR/s

Attachments

K.S. Canady affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

K.S. Canady, Vice President

Subscribed and sworn to me: May 29, 2002
Date

Mary P. Nelms
Notary Public

My commission expires: JAN 22, 2006
Date

SEAL

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NCEMC
PMPA
SREC
Catawba Document Control File 801.01
McGuire Document Control File
Catawba RGC Date File
ELL-EC050

ATTACHMENT 1a

MARKED-UP TS PAGES FOR CATAWBA

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented, and maintained.

5.5.1 Offsite Dose Calculation Manual (ODCM)

The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program.

Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

   1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   2. a determination that the change(s) do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

b. Shall become effective after the approval of the Station Manager; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, except that the containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.1.1 Type A test, prior to initiating the Type A test.

(1)

Replace with INSERT 1

(continued)

INSERT 1 for Catawba:

as modified by the following exceptions:

a. The containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.1.1 Type A test, prior to initiating the Type A test; and

b. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 14, 2000 (Unit 1) and February 7, 1993 (Unit 2) Type A test shall be performed no later than November 13, 2015 (Unit 1) and February 6, 2008 (Unit 2).

INSERT 1 for McGuire:

, as modified by the following exception:

a. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the May 27, 1993 (Unit 1) and August 20, 1993 (Unit 2) Type A test shall be performed no later than May 26, 2008 (Unit 1) and August 19, 2008 (Unit 2).

ATTACHMENT 1b

MARKED-UP TS PAGES FOR MCGUIRE

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented, and maintained.

5.5.1 Offsite Dose Calculation Manual (ODCM)

The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program.

Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

   1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   2. a determination that the change(s) do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

b. Shall become effective after the approval of the Station Manager; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, for Type A testing, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995.

Replace with INSERT 1

(continued)

INSERT 1 for Catawba:

as modified by the following exceptions:

a. The containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.1.1 Type A test, prior to initiating the Type A test; and

b. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 14, 2000 (Unit 1) and February 7, 1993 (Unit 2) Type A test shall be performed no later than November 13, 2015 (Unit 1) and February 6, 2008 (Unit 2).

INSERT 1 for McGuire:

, as modified by the following exception:

a. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the May 27, 1993 (Unit 1) and August 20, 1993 (Unit 2) Type A test shall be performed no later than May 26, 2008 (Unit 1) and August 19, 2008 (Unit 2).

ATTACHMENT 2a

REPRINTED TS PAGES FOR CATAWBA

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented, and maintained.

5.5.1 Offsite Dose Calculation Manual (ODCM)

The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program.

Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

   1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   2. a determination that the change(s) do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

b. Shall become effective after the approval of the Station Manager; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exceptions:

a. The containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.1.1 Type A test, prior to initiating the Type A test; and

(continued)

5.5 Programs and Manuals

5.5.2 Containment Leakage Rate Testing Program (continued)

b. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the November 14, 2000 (Unit 1) and February 7, 1993 (Unit 2) Type A test shall be performed no later than November 13, 2015 (Unit 1) and February 6, 2008 (Unit 2).

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 14.68 psig. The containment design pressure is 15 psig. The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.3% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first plant startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.75\ L_a$ for Type A tests and $< 0.6\ L_a$ for Type B and Type C tests.

b. Air lock testing acceptance criteria for the overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$. For each door, the leakage rate is $\leq 0.01\ L_a$ when tested at ≥ 14.68 psig.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

5.5.3 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include Containment Spray, Safety Injection, Chemical and Volume Control, and Nuclear Sampling. The program shall include the following:

a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at refueling cycle intervals or less.

5.5.4 DELETED

(continued)

ATTACHMENT 2b

REPRINTED TS PAGES FOR MCGUIRE

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented, and maintained.

5.5.1 Offsite Dose Calculation Manual (ODCM)

The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program.

Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

   1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   2. a determination that the change(s) do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

b. Shall become effective after the approval of the Station Manager; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, for Type A testing, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exception:

a. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the May 27, 1993 (Unit 1) and August 20, 1993 (Unit 2) Type A test shall be performed no later than May 26, 2008 (Unit 1) and August 19, 2008 (Unit 2).

(continued)

ATTACHMENT 3

DESCRIPTION OF PROPOSED CHANGES AND TECHNICAL JUSTIFICATION

BACKGROUND INFORMATION

The primary containment structure for the Catawba and McGuire units consists of a freestanding steel vessel with an ice condenser and a separate secondary containment that is a reinforced concrete shield building. The primary containment vessel consists of a cylindrical wall, a hemispherical dome, and a flat circular base. The containments for each station are described in Chapter 6 of the respective station's UFSAR.

The Catawba and McGuire TS (TS 5.5.2) establish the requirements for implementing a program to perform containment leakage rate testing in accordance with 10 CFR 50.54(o) and 10 CFR 50, Appendix J. The types of containment leakage tests include Type A (containment ILRT), Type B (local leakrate testing for containment penetrations, hatches, personnel air locks, etc.), and Type C (local leakrate testing for containment isolation valves). Catawba conducts all three types of containment leak testing (Types A, B, and C) according to the performance-based requirements of 10 CFR 50, Appendix J, Option B. McGuire presently conducts Type A testing according to Option B and conducts Type B and Type C testing according to the prescriptive requirements of Option A. (A license amendment request has been submitted for McGuire to transition to Option B for Type B and Type C testing.)

There is an ongoing initiative between the nuclear industry and the NRC to modify the existing performance-based leakage testing guidance to extend the maximum Type A test interval. This guidance is contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," September 1995. Regulatory Guide 1.163 endorses, with certain exceptions, NEI 94-01, "Nuclear Energy Institute Industry Guideline For Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," Revision 0, July 26, 1995. In the interim, a number of plants have submitted proposed license amendments to request, on a one-time basis, an extension of the existing ten-year maximum interval for conducting Type A tests to fifteen years.

DESCRIPTION OF PROPOSED CHANGES AND TECHNICAL JUSTIFICATION

Description of Proposed Changes

The proposed amendments request a one-time exception to the ten-year frequency of the performance-based Type A test as required by NEI 94-01. The exception is to allow the next

ILRT to be performed within fifteen years from the last ILRT, which for each Catawba and McGuire unit was performed on the following dates:

Catawba Unit 1 - November 14, 2000
Catawba Unit 2 - February 7, 1993
McGuire Unit 1 - May 27, 1993
McGuire Unit 2 - August 20, 1993

TS 5.5.2 is being modified for Catawba and McGuire to indicate that an exception to Regulatory Guide 1.163 is being taken, in that relative to NEI 94-01-1995, Section 9.2.3, the first Type A test performed after the Type A test on the date shown for each unit shall be performed no later than the date specified. Refer to the markups and reprinted pages of each station's TS 5.5.2 for the specific dates shown.

Technical Justification

Regulatory Requirements and General Discussion

The testing requirements of 10 CFR 50, Appendix J, provide assurance that leakage through the containment, including systems and components that penetrate the containment, does not exceed the allowable leakage values specified in the TS. The limitation of containment leakage provides assurance that the containment will perform its design function following a design basis accident.

10 CFR 50, Appendix J, was revised in 1995 to allow licensees to employ either the prescriptive containment leakage rate testing requirements of Option A or the performance-based leakage rate testing requirements of Option B. Both Catawba and McGuire conduct Type A testing according to Option B requirements. Catawba and McGuire TS 5.5.2 contain a general reference to Regulatory Guide 1.163.

Exceptions to the requirements of Regulatory Guide 1.163 are allowed by 10 CFR 50, Appendix J, Option B, Section V.B., "Implementation," which states, "The regulatory guide or other implementation document used by a licensee, or applicant for an operating license, to develop a performance-based leakage-testing program must be included, by general reference, in the plant technical specifications. The submittal for technical specification revisions must contain justification, including supporting analyses, if the licensee chooses to deviate from methods approved by the Commission and endorsed in a regulatory guide." Therefore,

these license amendment requests do not require an exemption to Option B or any other regulations.

The adoption of the Option B requirements did not alter the basic method by which leakage rate testing is performed, but it did alter the frequency of measuring primary containment leakage in ILRTs. Frequency is based upon an evaluation which examines the "as-found" leakage history to determine the frequency for leakage testing which provides assurance that leakage limits will be maintained. The changes to Type A test frequency did not directly result in an increase in containment leakage. Similarly, the proposed changes contained in these amendment requests will not directly result in an increase in containment leakage.

The allowed frequency for testing was based upon a generic evaluation documented in NUREG-1493, "Performance-Based Containment Leak-Test Program," September 1995. NUREG-1493 made the following observations with regard to decreasing the test frequency:

- Reducing the Type A (ILRT) testing frequency to one per twenty years was found to lead to an imperceptible increase in risk. The estimated increase in risk is small because ILRTs identify only a few potential leakage paths that cannot be identified by Type B and C testing, and the leaks that have been found by Type A tests have been only marginally above the existing requirements. Given the insensitivity of risk to containment leakage rate, and the small fraction of leakage detected solely by Type A testing, increasing the interval between ILRT testing has minimal impact on public risk.

- While Type B and C tests identify the vast majority (greater than 95%) of all potential leakage paths, performance-based alternatives are feasible without significant risk impacts. Since leakage contributes less than 0.1 percent of overall risk under existing requirements, the overall effect is very small.

The surveillance frequency for Type A testing in NEI 94-01 is at least once per ten years based on an acceptable performance history (i.e., two consecutive periodic Type A tests at least 24 months apart where the calculated performance leakage rate was less than the maximum allowable leakage rate ($1.0 \times L_a$) and consideration of the performance factors in NEI 94-01, Section 11.3). Based on the last two ILRTs for each Catawba and McGuire unit, the current interval for each unit is once every ten years.

Previous Catawba and McGuire Type A test results have shown leakage to be below the leakage limits. Refer to Appendix A at the end of this attachment for a summary of Type A test results for Catawba and McGuire. Accordingly, the proposed extension of the Type A test for Catawba and McGuire represents minimal risk for increased leakage. The risk is further minimized by continued Type B and Type C testing. Also, the Catawba and McGuire Inservice Inspection (ISI) programs and maintenance rule inspections provide additional confidence in containment structural integrity and leak tightness.

Risk Discussion

The proposed amendments are submitted on a risk-informed basis as described in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," July 1998.

Duke Energy Corporation has completed risk assessments of the proposed amendments for Catawba and McGuire. These assessments use the guidance provided in EPRI TR-104285 and the process identified in NUREG-1493 to evaluate the risk impact of the ILRT extension requests. Additionally, the assessments compare the results to guidance contained in Regulatory Guide 1.174. The assessments consider three risk metrics - Person-Rem risk, Large Early Release Frequency (LERF), and Conditional Containment Failure Probability (CCFP). There is no impact on Core Damage Frequency. Based on the results of the assessments, the extension requests have a small but acceptable increase in risk.

The assessments use the results of the Catawba and McGuire Revision 2 Internal Events Probabilistic Risk Assessments (PRAs). The Catawba and McGuire PRAs are full scope, level 3 PRAs. The containment end-states developed in the PRAs were assigned to each of the EPRI Accident Classes identified in EPRI TR-104285. This information is contained in Table 1a and Table 1b for Catawba and McGuire, respectively.

Table 1a
Catawba PRA Revision 2 Internal Events Risk Results[a] Mapped to EPRI Accident

Accident Class	Frequency (yr^{-1})	Person-Rem[b]	Person-Rem (yr^{-1})	Comments
1	2.23E-05	1.72E+03	3.84E-02	
2	1.31E-07	9.41E+04	1.23E-02	Includes both small and large isolation failures (EPRI Class 2). Also includes isolation failures due to latent human error – failure to restore the isolation following maintenance (EPRI Class 6).
3				Not developed in the Catawba PRA.
4				Not developed in the Catawba PRA.
5				Not developed in the Catawba PRA.
6				Included in Class 2.
7	2.38E-05	7.69E+05	1.83E+01	
8	3.02E-07	9.57E+06	2.88E+00	
Total	4.64E-05		2.13E+01	

a Source of data is Catawba SAMDA Analysis ("Catawba Nuclear Station Severe Accident Mitigation Design Alternatives (SAMDAs) Analysis for License Renewal," Duke Power Company, CNC-1535.07-00-0020)

b Frequency weighted Person-Rem = sum of Person-Rem risk/sum of release category frequency

Table 1b
McGuire PRA Revision 2 Internal Events Risk Results[a] Mapped to EPRI Accident

Accident Class	Frequency (yr^{-1})	Person-Rem[b]	Person-Rem (yr^{-1})	Comments
1	1.72E-05	1.97E+03	3.38E-02	
2	5.33E-08	2.14E+05	1.14E-02	Includes both small and large isolation failures (EPRI Class 2). Also includes isolation failures due to latent human error – failure to restore the isolation following maintenance (EPRI Class 6).
3				Not developed in the McGuire PRA.
4				Not developed in the McGuire PRA.
5				Not developed in the McGuire PRA.
6				Included in Class 2.
7	1.06E-05	3.11E+05	3.30E+00	
8	2.46E-07	1.11E+07	2.73E+00	
Total	2.81E-05		6.08E+00	

a Source of data is McGuire SAMDA Analysis ("McGuire Nuclear Station Severe Accident Mitigation Design Alternatives (SAMDAs) Analysis for License Renewal," Duke Power Company, MCC-1535.07-00-0019)

b Frequency weighted Person-Rem = sum of Person-Rem risk/sum of release category frequency

Accident Class 3 is the EPRI Accident Class that contains leakage and/or containment failure where the response is affected by ILRT. For the Catawba and McGuire studies, Class 3 was divided into two groups. Class 3a represents a small leak that is less than 10 x L_a (or 3 weight-percent/day). Class 3b represents a much larger leak that contributes to LERF. The probability of leakage associated with Class 3 is assumed to be proportional to the time between tests. The probability of Class 3a was estimated using data from NUREG-1493. NUREG-1493 found that there have been five failed ILRTs out of 180 ILRTs that only ILRTs could have detected. Based on this data, the Class 3a probability is approximately 0.03. The Class 3b probability was estimated using the Jeffrey's "non-informative prior distribution" (Engelhardt, M.E., "Events in Time: Basic Analysis of Poisson Data," Idaho National Engineering Laboratory, EG&G Idaho, Incl., EGG-RAAM-11088, September 1994):

$$\text{Failure Probability} = \frac{\text{Number of Failures (0)} + \frac{1}{2}}{\text{Number of Tests (180)} + 1}$$

The data for Class 3b consists of zero failures out of 180 ILRTs. The resulting probability is approximately 0.003. These values were used to estimate the frequencies of Class 3a and Class 3b.

For each Accident Class, the population dose and LERF were estimated. For Class 3a, the population dose is assumed to be 10 times the Catawba or McGuire PRA no containment failure dose (the no containment failure end-states assume that containment leaks at 1 x L_a). For Class 3b, the population dose was assumed to be the same as the population dose for the isolation failure end-states.

The Accident Classes in Table 1a and Table 1b can be placed into two groups - those that are LERF and those that are not LERF. The LERF due to Class 3b was estimated by multiplying the Class 3b probability and the frequency of Accident Classes that are not LERF. The off-site consequences associated with Class 3a are assumed to be small and do not impact LERF.

The CCFP was calculated using the following equation:

$$\text{CCFP} = 1 - \frac{\text{Intact Containment Frequency}}{\text{Total Core Damage Frequency}}$$

The risk metrics were calculated for each of the following test intervals:

- 3 tests in 10 years - original requirements for ILRT
- 1 test in 10 years - Catawba and McGuire current test interval
- 1 test in 15 years - Catawba and McGuire current test interval plus extension request
- 1 test in 18 years - sensitivity case
- 1 test in 20 years - sensitivity case

The results of the Catawba and McGuire ILRT risk assessments are contained in Table 2a and Table 2b, respectively.

Table 2a
Summary of Catawba Assessment Risk Results

Case	Person-Rem Risk (yr^{-1})			LERF			CCFP		
	Total	Increase Relative to Baseline	Increase Relative to Current Interval	Total	Increase Relative to Baseline	Increase Relative to Current Interval	Total	Increase Relative to Baseline	Increase Relative to Current Interval
3 per 10 yr (baseline)	2.128E+01			3.59E-06			52.30%		
1 per 10 yr (current)	2.131E+01	3.43E-02		3.83E-06	2.41E-07		52.57%	0.27%	
1 per 15 yr	2.134E+01	6.00E-02	2.57E-02	4.01E-06	4.22E-07	1.81E-07	52.77%	0.47%	0.20%
1 per 18 yr	2.135E+01	7.53E-02	4.10E-02	4.12E-06	5.30E-07	2.89E-07	52.89%	0.59%	0.32%
1 per 20 yr	2.137E+01	8.57E-02	5.14E-02	4.19E-06	6.03E-07	3.62E-07	52.97%	0.67%	0.40%

Table 2b
Summary of McGuire Assessment Risk Results

Case	Person-Rem Risk (yr^{-1})			LERF			CCFP		
	Total	Increase Relative to Baseline	Increase Relative to Current Interval	Total	Increase Relative to Baseline	Increase Relative to Current Interval	Total	Increase Relative to Baseline	Increase Relative to Current Interval
3 per 10 yr (baseline)	6.096E+00			1.12E-06			39.07%		
1 per 10 yr (current)	6.125E+00	2.93E-02		1.27E-06	1.52E-07		39.41%	0.34%	
1 per 15 yr	6.147E+00	5.12E-02	2.19E-02	1.38E-06	2.65E-07	1.14E-07	39.66%	0.60%	0.26%
1 per 18 yr	6.160E+00	6.43E-02	3.50E-02	1.45E-06	3.33E-07	1.81E-07	39.82%	0.75%	0.41%
1 per 20 yr	6.169E+00	7.31E-02	4.39E-02	1.50E-06	3.79E-07	2.28E-07	39.92%	0.86%	0.51%

The first risk measure that was considered in the assessments is Person-Rem risk. The increase in Person-Rem risk for extending the Type A test frequency from one test in ten years to one test in fifteen years is estimated to be 2.57E-02 (Catawba) and 2.19E-02 (McGuire) Person-Rem/yr. This increase is a small change in the public health risk. Extending the Type A test frequency by five years does not have a significant impact on Person-Rem risk.

The second risk measure considered in the assessments is LERF. The historical data (NUREG-1493) indicates that there has not been a failed ILRT that resulted in a leak rate sufficient to qualify as LERF. However, for comparison to Regulatory Guide 1.174, an estimate of LERF was determined as described above.

The estimated increase in LERF due to extending the ILRT interval of ten years by five years is 1.81E-07/yr (Catawba) and 1.14E-07/yr (McGuire). Changes in LERF that are less than 1.0E-07/yr are considered very small in Regulatory Guide 1.174. These increases in LERF are slightly above the Regulatory Guide 1.174 value for a very small change. When the increase in LERF is between 1.0E-07/yr and 1.0E-06/yr, the total LERF must be considered. For these situations, the total LERF must be less than 1.0E-05/yr. For the case of a test frequency of one in fifteen years, the total LERF is 4.01E-06/yr (Catawba) and 1.38E-06/yr (McGuire). Therefore, extending the ILRT frequency from one test in ten years to one test in fifteen years is acceptable by the Regulatory Guide 1.174 guidelines.

The assessments calculated the CCFP for the Type A test intervals. Extending the test interval by five years increases the CCFP by 0.20% (Catawba) and 0.26% (McGuire) above that for the current frequency of one test in ten years. The requested extensions have very little impact on CCFP.

The Person-Rem risk results in these analyses are slightly higher than the results in NUREG-1493 and the EPRI analysis. These two previous assessments found that extending the Type A test interval results in a Person-Rem risk increase that is much less than 1% (0.02% to 0.14%). The main difference in the Person-Rem risk increase calculated in the Catawba and McGuire assessments and the previous assessments is the assumption of the dose associated with Class 3b. Neither the NUREG study nor the EPRI study considers a very large leak that is sufficient to result in LERF. These studies

assumed that a Type A failure would result in a leak rate of approximately 2 x L_a. However, since Class 3b is supposed to represent LERF, then the Person-Rem associated with Class 3b is very large compared to the Person-Rem for a 2 x L_a leak. The leak rate and the dose associated with Class 3b are more representative of a hole in containment versus a leak in containment.

Based on the results of these analyses, the Catawba and McGuire ILRT extension results have an acceptable impact on plant risk.

Note that for these risk assessments, the potential for containment leakage is included in the assessments. The intact containment cases (EPRI Containment Failure Class 1) include a leakage term, which is independent of the source of the leak. In the Catawba and McGuire PRAs, the intact containment class is assumed to leak at the design leak rate. The Catawba and McGuire ILRT risk assessments also include specific containment failure classes due to extending the ILRT interval (Classes 3a and 3b). These classes include the potential that the leakage is due to a liner failure. The assessments show that even with the increased potential to have an undetected containment flaw or leak path, the increase in risk is acceptable.

The Catawba and McGuire PRAs, Revision 2, are full scope, level 3 PRAs. Revision 2 of the PRAs uses the containment capacity analyses developed for the Catawba and McGuire IPE submittals. The Catawba and McGuire IPE submittals included a copy of the Catawba and McGuire PRAs, Revision 1 report. Appendix G of the Catawba and McGuire PRAs, Revision 1 report, is a detailed description of the Catawba and McGuire containment capacity assessments. The analyses identified expected failure locations, which would result in a large leak area, and quantified the expected failure pressure for use in the IPEs. These analyses were then utilized in the development of the IPE source terms as well as the Revision 2 PRA source terms. The public health consequences (dose, etc.) were analyzed in the Catawba and McGuire SAMDA analyses. The dose results were then used to estimate the impact of extending the Catawba and McGuire ILRT interval.

Other Considerations

Catawba and McGuire personnel perform inspection activities on the containment structure to support performance of the required Type A tests. Personnel also perform containment inspections in accordance with the ASME Section XI Subsection IWE ISI programs. The IWE programs will continue

to perform inspection activities on the Catawba and McGuire containments through the proposed test extension intervals.

Catawba and McGuire have performed visual examinations of the metal containments in accordance with the IWE programs. To date, no major indications of containment degradation have been found. These periodic IWE inspections provide assurance that degradation of the containment structures will be detected and corrected before it can affect the structural integrity or leak tightness.

10 CFR 50.55a(b)(2)(ix)(E) requires that a general visual examination as required by Subsection IWE must be performed once each period. Because there are three inspection periods every ten years, this general visual examination is required to be performed three times every ten years, regardless of whether a Type A test is performed. Catawba and McGuire currently use the 1992 Edition with the 1992 Addenda of the ASME Code, Section XI, Subsection IWE for containment inservice inspection. In addition to the general visual examinations indicated above, Catawba and McGuire perform other visual and non-destructive examinations (NDE) required by Subsection IWE.

Containment metallic surfaces that are subject to conditions that warrant augmented examination are examined in accordance with the requirements of the ASME Code, Section XI, IWE-2500, Table IWE-2500-1, Category E-C. Those conditions that warrant augmented examination are indicated in IWE-1240. Ultrasonic thickness measurements are performed on surfaces subject to augmented examination which are not accessible for visual examination. If degradation is detected on surfaces that are not accessible for visual examination, an evaluation must be performed to determine what additional examinations, repairs, or replacement activities are necessary.

Duke Energy Corporation has received NRC approval to use Request for Alternative Serial Number 98-GO-001, eliminating the need to perform visual examinations of seals and gaskets in accordance with the 1992 Edition with the 1992 Addenda of the ASME Code, Section XI, Subsection IWE, Table IWE-2500-1, Category E-D, Items E5.10 and E5.20. There is still a requirement to perform a visual VT-1 examination of every containment bolted connection every ten years in accordance with Table IWE-2500-1, Category E-G, Item E8.10. These examinations, in conjunction with Type B tests, are judged sufficient to assure the continued integrity of containment bolted connections with seals and gaskets.

Regarding components whose integrity is typically verified during an ILRT, Catawba and McGuire employ dual ply bellows on all containment penetration assemblies for piping systems containing hot fluids. The dual ply bellows are fitted with a test connection that allows for pressurization of the space between the bellows. For all bellows on penetrations between the containment and annulus, Catawba and McGuire vent the space between the bellows to the annulus during the ILRT. Following completion of the ILRT, each dual ply bellows assembly is subjected to a low-pressure test of the space between the bellows to demonstrate the integrity of both bellows, with leaking bellows tested at accident pressure in the accident direction. For Catawba, this test is also performed at least once every two years, as required by Appendix J. McGuire has an exemption to Appendix J that only requires this test to be performed following the ILRT. At the completion of this test, all test connections are closed, except for the main steam and main feedwater penetration outer bellows test connections, which remain open and vented to the annulus. This measure eliminates these bellows as potential bypass leak paths. The other bellows are located in the annulus and, therefore, do not constitute potential bypass leak paths.

In addition, a general visual examination is performed prior to the ILRT as stated above and a containment coating inspection is performed every refueling outage. The coating inspection is a general visual inspection of the inside of containment and the annulus area, the outside of containment, and the inside of the reactor building. This inspection includes a general inspection of the accessible portions of all penetrations.

Summary of Type A Test Results for Catawba and McGuire

Test Type	Test Date	Test Method	Test Results[1] (weight-percent/day)		
			As-Found[2]	Performance[2]	As-Left[2]
Catawba Unit 1					
Pre-Op	1/13/84	Mass Point	N/A	N/A	0.1108
1st Periodic	11/25/87	Mass Point	0.0614	0.0522	0.0522
2nd Periodic	3/29/91	Mass Point	0.0675	0.0675	0.0675
3rd Periodic	11/14/00	Mass Point	0.0965	0.0965	0.0965
Catawba Unit 2					
Pre-Op	7/8/85	Mass Point	N/A	N/A	0.1256
1st Periodic	3/17/89	Mass Point	0.0243	0.0243	0.0243
2nd Periodic	2/7/93	BN-TOP-1 Mass Point	0.1461 0.0906	0.1461 0.0906	0.1461 0.0906

Summary of Type A Test Results for Catawba and McGuire

Test Type	Test Date	Test Method	Test Results[1] (weight-percent/day)		
			As-Found[2]	Performance[2]	As-Left[2]
McGuire Unit 1					
Pre-Op	8/23/79	Mass Point	N/A	N/A	0.1137
1st Periodic	4/18/83	Mass Point	0.1446	0.1441	0.1446
2nd Periodic	8/17/86	Mass Point	0.1566	0.1527	0.1533
3rd Periodic	5/2/90	Mass Point	0.1965	0.1953	0.1965
4th Periodic	5/30/93	BN-TOP-1 Mass Point	0.2064 0.1482	0.2063 0.1481	0.2064 0.1482
McGuire Unit 2					
Pre-Op	9/28/82	Mass Point	N/A	0.0877	0.0880
1st Periodic	5/26/86	Mass Point	0.2959[3]	0.0834	0.0837
2nd Periodic	8/28/89	Mass Point	0.1138	0.1134	0.1138
3rd Periodic	8/24/93	BN-TOP-1 Mass Point	0.2009 0.1469	0.1964 0.1424	0.2009 0.1469

Notes:

(1) All test results reported at the 95% upper confidence limit and include the leakage penalty total for all Type B and C penetrations not challenged during performance of the Type A test.

(2) As-left acceptance criteria (< 0.75 x L_a): < 0.225 weight-percent/day
Performance acceptance criteria (< 1.0 x L_a): < 0.300 weight-percent/day
As-found acceptance criteria (< 1.0 x L_a): < 0.300 weight-percent/day

(3) This value for as-found leakage was due to 2 gpm liquid leakage through both containment isolation valves 2WL-1B and 2WL-2A (penetration M375) found while troubleshooting excess reactor coolant leakage (described in LER 370-86-03). As a result, 94,500 sccm (from penetration M375) of a total 96,100 sccm (total penetration leakage as-found savings) was added to the 37,900 sccm measured leakage from the ILRT to account for the 134,000 sccm (0.2959 weight-percent/day) result. This information was reported as an addendum to the Unit 2 ILRT Report by H.B. Tucker to H.R. Denton letter dated September 30, 1986.

ATTACHMENT 4

NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The following discussion is a summary of the evaluation of the changes contained in these proposed amendments against the 10 CFR 50.92(c) requirements to demonstrate that all three standards are satisfied. A no significant hazards consideration is indicated if operation of the facility in accordance with the proposed amendments would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated, or

2. Create the possibility of a new or different kind of accident from any accident previously evaluated, or

3. Involve a significant reduction in a margin of safety.

First Standard

The proposed amendments will not involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed extension to the Type A testing intervals cannot increase the probability of an accident previously evaluated since extension of the intervals is not a physical plant modification that could alter the probability of accident occurrence, nor is it an activity or modification by itself that could lead to equipment failure or accident initiation. The proposed extension to the Type A testing intervals does not result in a significant increase in the consequences of an accident as documented in NUREG-1493. The NUREG notes that very few potential containment leakage paths are not identified by Type B and Type C tests. It concludes that reducing the Type A testing frequency to once per twenty years leads to an imperceptible increase in risk.

Catawba and McGuire provide a high degree of assurance through testing and inspection that the containments will not degrade in a manner detectable only by Type A testing. Recent Type A tests for the Catawba and McGuire units identified containment leakage within acceptance criteria, indicating a very leak tight containment. Inspections required by the ASME Code are also performed in order to identify indications of containment degradation that could affect leak tightness. Separately, Type B and Type C testing, required by TS, identify any containment opening from design penetrations, such as valves, that would otherwise be detected by a Type A test. These factors establish that an extension to the Type A test intervals will not represent a significant increase in the consequences of an accident.

Second Standard

The proposed amendments will not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed revisions to the Catawba and McGuire TS add a one-time extension to the current interval for Type A testing. The current test interval of ten years, based on past performance, would be extended on a one-time basis to fifteen years from the last Type A test. The proposed extension to Type A test intervals does not create the possibility of a new or different type of accident since there are no physical changes being made to the plants and there are no changes to the operation of the plants that could introduce a new failure mode.

Third Standard

The proposed amendments will not involve a significant reduction in a margin of safety. The proposed revisions to the Catawba and McGuire TS add a one-time extension to the current interval for Type A testing. The current test interval of ten years, based on past performance, would be extended on a one-time basis to fifteen years from the last Type A test. The proposed extension to Type A test intervals will not significantly reduce the margin of safety. The NUREG-1493 generic study of the effects of extending containment leakage testing intervals found that a twenty-year interval resulted in an imperceptable increase in risk to the public. NUREG-1493 found that, generically, the design containment leakage rate contributes about 0.1 percent of the overall risk and that decreasing the Type A testing frequency would have a minimal effect on this risk, since 95 percent of the Type A detectable leakage paths would already be detected by Type B and Type C testing. Similar proposed changes have been previously reviewed and approved by the NRC, and they are applicable to Catawba and McGuire.

Based upon the preceding discussion, Duke Energy Corporation has concluded that the proposed amendments do not involve a significant hazards consideration.

ATTACHMENT 5

ENVIRONMENTAL ANALYSIS

Pursuant to 10 CFR 51.22(b), an evaluation of these license amendment requests has been performed to determine whether or not they meet the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) of the regulations.

These amendments to the Catawba and McGuire TS allow for a one-time extension of ILRT intervals from ten to fifteen years from the date of the last successful test. Implementation of these amendments will have no adverse impact upon the Catawba or McGuire units; neither will they contribute to any additional quantity or type of effluent being available for adverse environmental impact or personnel exposure.

It has been determined there is:

1. No significant hazards consideration,

2. No significant change in the types, or significant increase in the amounts, of any effluents that may be released offsite, and

3. No significant increase in individual or cumulative occupational radiation exposures involved.

Therefore, these amendments to the Catawba and McGuire TS meet the criteria of 10 CFR 51.22(c)(9) for categorical exclusion from an environmental impact statement.