



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 2, 2000

Mr. H. B. Barron  
Vice President, McGuire Site  
Duke Energy Corporation  
12700 Hagers Ferry Road  
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 RE: ISSUANCE OF  
AMENDMENTS (TAC NOS. MA7316 AND MA7317)

Dear Mr. Barron:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 196 to Facility Operating License NPF-9 and Amendment No. 177 to Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated November 23, 1999, as supplemented by letter dated September 6, 2000.

The amendments revise TS 5.5.11, "Ventilation Filter Testing Program" to include the requirement for laboratory testing of Engineered Safety Feature Ventilation System charcoal samples in accordance with American Society for Testing and Materials D3803-1989 and the application of a safety factor of 2.0 to the charcoal filter efficiency assumed in the plant design-basis dose analyses.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

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

Docket Nos. 50-369 and 50-370

Enclosures:

1. Amendment No. 196 to NPF-9
2. Amendment No. 177 to NPF-17
3. Safety Evaluation

cc w/encl: See next page

DFOI

MIRR - 058

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/RA/

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Docket Nos. 50-369 and 50-370

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McGuire Nuclear Station

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

DUKE ENERGY CORPORATION

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 196  
License No. NPF-9

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility), Facility Operating License No. NPF-9 filed by the Duke Energy Corporation (licensee) dated November 23, 1999, supplemented by letter dated September 6, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 196 , are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: November 2, 2000



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

DUKE ENERGY CORPORATION

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177  
License No. NPF-17

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility), Facility Operating License No. NPF-17 filed by the Duke Energy Corporation (licensee) dated November 23, 1999, supplemented by letter dated September 6, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

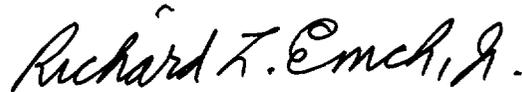
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 177 , are hereby incorporated into this license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Technical Specification  
Changes

Date of Issuance: November 2, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 196

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

ATTACHMENT TO LICENSE AMENDMENT NO. 177

FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove

5.5-14

Insert

5.5-14

5.5 Programs and Manuals

5.5.11 Ventilation Filter Testing Program (VFTP) (continued)

ESF Ventilation System	Penetration	Flowrate
Annulus Ventilation	< 1%	8000 cfm
Control Area Ventilation	< 0.05%	2000 cfm
Aux. Bldg. Filtered Exhaust (2 fans)(Unit 1)	< 1%	45,700 cfm
Aux. Bldg. Filtered Exhaust (2 fans)(Unit 2)	< 1%	40,500 cfm
Containment Purge (non-ESF) (2 fans)	< 1%	21,000 cfm
Fuel Bldg. Ventilation (non-ESF)	< 1%	35,000 cfm

- b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows the following penetration and system bypass when tested in accordance with Regulatory Guide 1.52, Revision 2, and ANSI N510-1975 (N510-1980 for Auxiliary Building Filtered Exhaust) at the flowrate specified below  $\pm$  10%.

ESF Ventilation System	Penetration	Flowrate
Annulus Ventilation	< 1%	8000 cfm
Control Area Ventilation	< 0.05%	2000 cfm
Aux. Bldg. Filtered Exhaust (2 fans)(Unit 1)	< 1%	45,700 cfm
Aux. Bldg. Filtered Exhaust (2 fans)(Unit 2)	< 1%	40,500 cfm
Containment Purge (non-ESF) (2 fans)	< 1%	21,000 cfm
Fuel Bldg. Ventilation (non-ESF)	< 1%	35,000 cfm

- c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Guide 1.52, Revision 2, shows the methyl iodide penetration less than the value specified below when tested in accordance with ASTM D3803-1989 at the temperature and relative humidity (RH) specified below.

ESF Ventilation System	Penetration	RH	Temp.
Annulus Ventilation	< 4%	95%	30°C
Control Area Ventilation	< 0.95%	95%	30°C
Aux. Bldg. Filtered Exhaust	< 4%	95%	30°C
Containment Purge (non-ESF)	< 4%	95%	30°C
Fuel Bldg. Ventilation (non-ESF)	< 4%	95%	30°C

- d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is less than the value specified below when tested in accordance with Regulatory Guide 1.52, Revision 2, and ANSI N510-1975 at the flowrate specified below  $\pm$  10%.

(continued)



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 196 TO FACILITY OPERATING LICENSE NPF-9  
AND AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NPF-17

DUKE ENERGY CORPORATION

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By letter dated November 23, 1999, as supplemented by letter dated September 6, 2000, Duke Energy Corporation, et al. (DEC, the licensee), submitted a request for changes to the McGuire Nuclear Station, Units 1 and 2 (McGuire), Technical Specifications (TS). The requested changes would revise TS 5.5.11, "Ventilation Filter Testing Program" to include the requirement for laboratory testing of Engineered Safety Feature Ventilation System charcoal samples in accordance with American Society for Testing and Materials (ASTM) D3803-1989 and the application of a safety factor of 2.0 to the charcoal filter efficiency assumed in the plant design-basis dose analyses.

The letter dated September 6, 2000, provided clarifying information that did not change the scope of the November 23, 1999, application and the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The NRC staff, with technical assistance from Brookhaven National Laboratory (BNL), has reviewed the licensee's submittals. In addition, the staff has reviewed the attached BNL Technical Evaluation Report (TER) regarding the proposed TS changes for McGuire Nuclear Station, Units 1 and 2. Based on its review, the staff adopts the TER. In view of the above, because the NRC staff considers ASTM D3803-1989 to be the most accurate and most realistic protocol for testing charcoal in safety-related ventilation systems, it finds that the proposed TS changes satisfy the actions requested in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999, and are acceptable.

The NRC received a letter from ASTM in response to a March 8, 2000, Federal Register Notice (65 FR 12286) related to revising testing standards in accordance with ASTM D3803-1989 for laboratory testing of activated charcoal in response to GL 99-02. ASTM notified the NRC that the 1989 standard is out of date and should be replaced by D3803-1991(1998). The staff acknowledges that the most current version of ASTM D3803 is

ASTM D3803-1991 (reaffirmed in 1998). However, it was decided, for consistency purposes, to have all of the nuclear reactors test to the same standard (ASTM D3803-1989) because prior to GL 99-02 being issued, approximately one-third of the nuclear reactors had technical specifications that referenced ASTM D3803-1989 and there are no substantive changes between the 1989 and 1998 versions.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the North Carolina State official was notified of the proposed issuance of the amendments. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (65 FR15377). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Attachment: Technical Evaluation Report, Brookhaven National Laboratory

Principal Contributor: F. Rinaldi

Date: November 2, 2000

**TECHNICAL EVALUATION REPORT**  
**BROOKHAVEN NATIONAL LABORATORY**  
**FOR THE OFFICE OF NUCLEAR REACTOR REGULATION**  
**DIVISION OF SYSTEMS SAFETY AND ANALYSIS**  
**PLANT SYSTEMS BRANCH**  
**RELATED TO AMENDMENT TO FACILITY OPERATING LICENSE NO. NPF-9 & NPF-17**  
**DUKE ENERGY CORPORATION**  
**McGUIRE NUCLEAR STATION - UNITS 1 & 2**  
**DOCKET NOS. 50-369 & 50-370**

## **1.0 INTRODUCTION**

By letters dated November 23, 1999 and November 30, 1999, Duke Power Corporation submitted its response to the actions requested in Generic Letter (GL) 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal," dated June 3, 1999, for the McGuire Nuclear Station - Units 1&2. In the same dated letters, Duke Energy Corporation requested changes to the Technical Specifications (TS) Section 5.5.11.c, covering the Annulus Ventilation System (VE), the Control Area Ventilation System (VC), the Auxiliary Filtered Exhaust System (VA), the Containment Purge and Exhaust System (VP), and the Fuel Building Ventilation System (VF) for both units of the McGuire Nuclear Station. By letter dated September 6, 2000, Duke Energy Corporation submitted additional information clarifying the face velocities, the credited efficiencies, and the test penetrations for all ventilation systems. The proposed changes would revise the TS surveillance testing of three safety related and two non-safety related ventilation systems charcoal to meet the requested actions of GL 99-02.

## **2.0 BACKGROUND**

Safety-related air-cleaning units used in the engineered safety features (ESF) ventilation systems of nuclear power plants reduce the potential onsite and offsite consequences of a radiological accident by filtering radioiodine. Analyses of design basis accidents assume particular safety related charcoal adsorption efficiencies when calculating offsite and control room operator doses. To ensure that the charcoal filters used in these systems will perform in a manner that is consistent with the licensing basis of a facility, licensees have requirements in their TS to periodically perform a laboratory test (in accordance with a test standard) of charcoal samples taken from these ventilation systems.

In GL 99-02, the staff alerted licensees that testing nuclear-grade activated charcoal to standards other than American Society for Testing and Materials (ASTM) D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon," does not provide assurance for complying with their current licensing bases with respect to the dose limits of General Design Criterion (GDC) 19 of Appendix A to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR) and Subpart A of 10 CFR Part 100.

GL 99-02 requested that all licensees determine whether their TS reference ASTM D3803-1989 for charcoal filter laboratory testing. Licensees whose TS do not reference ASTM D3803-1989 were requested to either amend their TS to reference ASTM D3803-1989 or propose an alternative test protocol.

Attachment

### **3.0 EVALUATION**

#### **3.1 Laboratory Charcoal Sample Testing Surveillance Requirements**

The current and proposed laboratory charcoal sample testing TS surveillance requirements for the Annulus Ventilation System (VE), the Control Area Ventilation System (VC), the Auxiliary Filtered Exhaust System (VA), the Containment Purge and Exhaust System (VP), and the Fuel Building Ventilation System (VF) are shown in Table 1 and Table 2 for both Units 1&2. No revisions for the VC and VE systems are being proposed, since the charcoal testing for these systems has been performed using ASTM D3803-1989 in accordance with their current TS.

The proposed use of ASTM D3803-1989 is acceptable because it provides accurate and reproducible test results. A test temperature of 30°C for the VA, VP, and VF systems, with a relative humidity (RH) of 95% is being proposed. This is acceptable because these parameters are consistent with ASTM D3803-1989 and the actions requested in GL 99-02.

Based on the letter dated September 6, 2000, a proposed allowable charcoal penetration for radioactive methyl iodide of <4% in the VA system with a credited removal filter efficiency of 50% organic iodide, and <4% in both the VP and VF systems with a credited removal filter efficiency of  $\geq 85\%$  and  $\geq 70\%$  for organic iodide, respectively, result in safety factors above 2. The proposed safety factor of greater than 2 for all systems is acceptable because it ensures that the efficiency credited in the accident analysis is still valid at the end of the surveillance interval. This safety factor of greater than 2 for these three systems is acceptable because it is above the minimum safety factor of 2 specified in GL 99-02.

The August 23, 1999 errata to GL 99-02 clarified that if the maximum actual face velocity is greater than 110% of 40 fpm, then the test face velocity should be specified in the TS. Based on the letter dated September 6, 2000, the licensee stated that four systems, the VE, VA, VP, and VF systems, have a face velocity of less than 110% of 40 fpm. For the VC system, the actual face velocity of 44.44 fpm slightly greater than the test face velocity of 110% of 40 fpm. BNL finds this difference of 0.44 fpm in face velocities is within the computational error and therefore, is acceptable. The proposed testing of the charcoal adsorbers will be performed in accordance with ASTM D3803-1989 which specifies a test face velocity of 40 fpm with appropriate margins. This is acceptable because it ensures that the testing will be consistent with the operation of the ventilation systems during accident conditions. Therefore, it is not necessary to specify the face velocity in the proposed TS change. This is consistent with the August 23, 1999 errata to GL 99-02.

### **4.0 CONCLUSION**

On the basis of its evaluation, BNL recommends that the NRC staff consider the proposed TS changes to be acceptable.

Principal Contributor: Richard E. Deem and Mano Subudhi

Date: October 2, 2000

McGUIRE NUCLEAR STATION - UNITS 1&2

TABLE 1 - CURRENT TS REQUIREMENTS											
System Description						Current TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency Elemental/Organic (%)	Test Penetration (% methyl iodide)	Safety Factor ****	Test Standard	Test Temp (° C)	Test RH %	Test Face Velocity (fpm)
			Res. Time (sec)***	Face Velocity (fpm)							
5.511.c	Annulus Ventilation (VE)*	2	0.335	29.83	95/80	<4.0%	4	Reg. Guide 1.52, Rev.2 ASTM D3803-1989	30	95	Not stated
5.5.11.c	Control Area Ventilation (VC)*	4	0.225 per 2 inch bed	44.44	99/95	<0.95%	5	Reg. Guide 1.52, Rev.2 ASTM D3803-1989	30	95	Not stated
5.5.11.c	Aux. Bldg. Filtered Exhaust (VA)	2	Unit 1- 0.284 Unit 2 - 0.321	Unit 1- 35.18 Unit 2- 31.18	70/50	<10.0%	4.54	Reg. Guide 1.52, Rev.2 ASTM D3803-1979	30	95	Not stated
5.5.11.c	Containment Purge & Exhaust (VP) Non-ESF	2	0.305 0.228	32.81 43.75 **	85/85	<1.0%	7.5	Reg. Guide 1.52, Rev.2 ASTM D3803-1979	80	95	Not stated
5.5.11.c	Fuel Bldg. Ventilation (VF) Non-ESF	2	0.253	39.57	90/70	<1.0%	15	Reg. Guide 1.52, Rev.2 ASTM D3803-1979	80	95	Not stated

- \* Note that these two systems (VE and VC) are being tested to the GL 99-02 required standard. No TS changes are being requested for them. They are being included for completeness.
- \*\* The first value corresponds to a case with two VP filters running when the design flow is 10,500 cfm. The second value corresponds to a case with one VP filter running when the flow is 14,000 cfm.
- \*\*\* The resident times are calculated based on the charcoal bed depth and the actual face velocity for each system.
- \*\*\*\* Safety factors are calculated based on the formula given in the GL and accounts for in-place bypass leakage.

McGUIRE NUCLEAR STATION - UNITS 1&2

TABLE 2 - PROPOSED TS REQUIREMENTS											
System Description						Proposed TS Requirements					
TS Section	System	Bed Thickness (inches)	Actual Charcoal		Credited Efficiency Elemental/Organic (%)	Test Penetration (% methyl iodide)	Safety Factor *****	Test Standard	Test Temp (° C)	Test RH	Test Face Velocity (fpm) ****
			Res. Time (sec)***	Face Velocity (fpm)							
5.5.11.c	Annulus Ventilation (VE)*	2	0.335	29.83	95/80	<4.0	4	ASTM D3803-1989	30	95%	Not stated
5.5.11.c	Control Area Ventilation (VC)*	4	0.225 per 2 inch bed	44.44	99/95	<0.95	5	ASTM D3803-1989	30	95%	Not stated
5.5.11.c	Aux. Bldg. Filtered Exhaust (VA)	2	Unit 1-0.284 Unit 2-0.321	Unit 1-35.18 Unit 2-31.18	70/50	<4.0	10	ASTM D3803-1989	30	95%	Not stated
5.5.11.c	Containment Purge & Exhaust (VP) Non-ESF	2	0.305 0.228	32.81 43.75**	85/85	<4.0	3	ASTM D3803-1989	30	95%	Not stated
5.5.11.c	Fuel Bldg. Ventilation (VF) Non-ESF	2	0.253	39.57	90/70	<4.0	6	ASTM D3803-1989	30	95%	Not stated

- \* Note that these two systems (VE and VC) are being tested to the GL 99-02 required standard. No TS changes are being requested for them. They are being included for completeness.
- \*\* The first value corresponds to a case with two VP filters running when the design flow is 10,500 cfm. The second value corresponds to a case with one VP filter running when the flow is 14,000 cfm.
- \*\*\* The resident times are calculated based on the charcoal bed depth and the actual face velocity for each system.
- \*\*\*\* For each system, the test face velocity will be in accordance with the ASTM D3803-1989 requirements. Note that the maximum face velocity for the VC is 44.44 fpm which is above the 110% of 40 fpm (i.e., 44 fpm). The licensee and the staff recognize this negligible difference of 0.44 fpm above the ASTM D3803-1989 values.
- \*\*\*\*\* Safety factors are calculated based on the formula given in the GL and accounts for in-place bypass leakage.