

September 8, 1999

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

SUBJECT: MCGUIRE NUCLEAR STATION, UNIT 1 RE: ISSUANCE OF AMENDMENT  
(TAC NO. MA6324)

Dear Mr. Barron:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 186 to Facility Operating License NPF-9 for the McGuire Nuclear Station, Unit 1, in response to your application dated August 27, 1999. In your submittal and referenced documents, you requested a one-time extension of the surveillance frequency for Technical Specifications Surveillance Requirement (TSSR) 3.1.4.2 beyond the 25 percent extension allowed by TSSR 3.0.2. This license amendment is effective upon issuance and is to expire upon entering Mode 3 during Unit 1 startup following the Unit 1 End of Cycle 13 refueling outage.

A Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

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

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PDR ADDCK 05000369  
P PDR

Docket No. 50-369

Enclosures:

- 1. Amendment No. 186 to NPF-9
- 2. Safety Evaluation

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NAME	FRinaldi:cn	CHawes		REmch	JWerniel		WBeckner
DATE	9/2/99	9/2/99		9/18/99	9/12/99	#10	9/3/99
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DATE	9/2/99	9/14/99		9/18/99	9/18/99		

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\*Amendment and revised TS pages to be filed under both docket numbers and Units 1 and 2 authority files to maintain document integrity.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 8, 1999

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Sincerely,

A handwritten signature in cursive script, appearing to read "Frank Rinaldi".

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

Docket No. 50-369

Enclosures:

1. Amendment No. 186 to NPF-9
2. Safety Evaluation

cc w/encls: See next page

McGuire Nuclear Station

cc:

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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. 186  
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 August 27, 1999, 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.

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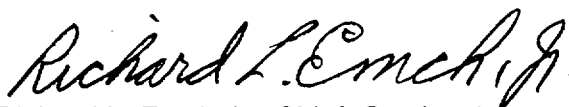
2. Accordingly, the license is hereby amended to authorize a one-time extension of the surveillance frequency for Technical Specifications Surveillance Requirement (TSSR) 3.1.4.2 beyond the 25 percent extension allowed by TSSR 3.0.2.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 186 , 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 expire upon entering Mode 3 during startup, following the End of Cycle 13 refueling outage.

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: September 8, 1999

ATTACHMENT TO LICENSE AMENDMENT NO. 186

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

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

Remove

3.1.4-4

Insert

3.1.4-4

Note: Amendment and revised TS pages to be filed under both docket numbers and Units 1 and 2 authority files to maintain document integrity.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
<p>SR 3.1.4.2 Verify rod freedom of movement (trippability) by moving each rod not fully inserted in the core <math>\geq 10</math> steps in either direction.</p>	<p>92 days</p> <p>OR</p> <p>Prior to entering MODE 3 upon Unit 1 startup following the Unit 1 End of Cycle 13 refueling outage</p> <p style="text-align: right;">}</p>
<p>SR 3.1.4.3 Verify rod drop time of each rod, from the fully withdrawn position, is <math>\leq 2.2</math> seconds from the beginning of decay of stationary gripper coil voltage to dashpot entry, with:</p> <p>a. <math>T_{avg} \geq 551^{\circ}\text{F}</math>; and</p> <p>b. All reactor coolant pumps operating.</p>	<p>Prior to reactor criticality after each removal of the reactor head</p>

\* One time change applicable to Unit 1 only



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 186 TO FACILITY OPERATING LICENSE NPF-9  
TO FACILITY OPERATING LICENSE NPF-52  
DUKE ENERGY CORPORATION  
MCGUIRE NUCLEAR STATION, UNIT 1  
DOCKET NOS. 50-369

1.0 INTRODUCTION

By letter dated August 27, 1999, Duke Energy Corporation (the licensee), submitted a request for a one-time 5-day extension of the surveillance frequency for Technical Specifications Surveillance Requirement (TSSR) 3.1.4.2 beyond the 25 percent extension allowed by TSSR 3.0.2 for the McGuire Nuclear Station, Unit 1. This license amendment is effective upon issuance and is to expire upon entering Mode 3 during Unit 1 startup following the Unit 1 End of Cycle 13 refueling outage.

The safety function of the reactor control rods is to drop into the core for safe shutdown of the reactor on receipt of a reactor trip signal. In lieu of testing this function by tripping the control rods, TSSR 3.1.4.2 provides confidence that all rods are operable by verifying individual control rod movement every 92 days. During a performance of this TSSR on August 21, 1999, the Unit 1 Rod Control System experienced an electrical control system failure which prevented movement of some control rods and completion of the TSSR. The equipment problem was isolated to the 1AC Power Cabinet associated with the Unit 1 Rod Control System. That power cabinet controls the movement of the Group I rods associated with Control Bank A, Control Bank C and Shutdown Bank A (Control Bank D is powered from a different power cabinet).

Factoring in the 25 percent extension of the surveillance frequency allowed by TSSR 3.0.2, the last date for completion of TSSR 3.1.4.2 on Unit 1 is September 12, 1999. Assuming a Unit 1 unscheduled outage does not occur prior to the 1EOC13 refueling outage, McGuire proposes to effect repairs and complete TSSR 3.1.4.2 during the 1EOC13 refueling outage, currently scheduled to begin on September 17, 1999.

2.0 EVALUATION

Repair of the failed equipment or completion of the surveillance testing at power would introduce the potential for a reactor trip. In the past, McGuire Nuclear Station has experienced reactor trips while performing maintenance on rod control and reactor trip circuitry at power. McGuire probabilistic risk assessment (PRA) analyses indicate that reactor trips at power do contribute to the Core Damage Frequency (CDF). Consequently, repair and completion of the surveillance testing during an outage will pose less nuclear safety risk than the inherent reactor



trip risks associated with online repairs and testing. Since the 1EOC13 refueling outage is scheduled to begin five days after the surveillance frequency interval ends, it is reasonable to postpone the surveillance.

The equipment failure which is preventing movement of some of the Unit 1 control rods is an electrical control system failure which does not affect the ability to trip rods. This failure has not caused the affected rods or the Unit 1 Rod Control System to be inoperable. The intent of TSSR 3.1.4.2 is to provide confidence that the control rods can trip the reactor by verifying individual rod movement. The BASES for that TSSR state that, if a control rod is experiencing movement problems, but remains trippable and aligned, the control rod is considered to be operable. All Unit 1 control rods currently satisfy the alignment criteria of TS 3.1.4 and TSSR 3.1.4.1. The BASES for TSSR 3.1.4.2 indicate that confidence as to the trippability of the control rod(s) can be obtained by verification that any movement problem is due to an electrical-related control system failure and not the result of mechanical binding of the rods. The fact that the problem is electrical has been verified. Since all Unit 1 control rods are trippable and properly aligned, they are operable.

Control Bank D is used for normal reactor control. After the equipment failure was verified, the surveillance testing was stopped and Control Bank D was successfully moved in and out a few steps to verify that Control Bank D could be used in normal operation. Thus, the inability to move some of the McGuire, Unit 1 control rods will not impact the ability to safely control the reactor during steady-state power operations prior to the 1EOC13 refueling outage. In addition, plant procedures and processes will ensure the safe controlled shutdown of Unit 1 at the start of the outage. The subject equipment failure will not impact the ability to trip the reactor if necessary. Finally, if a Unit 1 unscheduled outage occurs prior to the 1EOC13 refueling outage, McGuire would perform repairs during that outage and complete TSSR 3.1.4.2 prior to entering Mode 3 upon startup from that outage.

The McGuire PRA analyses indicate that a failure of the rod movement logic for a portion of the control rods does not directly contribute to the failure of any function modeled in the PRA. The control rod drive system impacts the McGuire PRA model directly only in its ability to cause a reactor trip and to release the rods when a reactor trip is required. The problems with the 1AC Power Cabinet may cause the control rods to respond to some transients differently from what would normally be expected. Consequently, the failure increases the probability of a reactor trip for those events which would normally only result in a runback in reactor power. However, given the short time period of the extension and the relatively low frequency of transients that would be expected to cause a problem, no meaningful impact on the estimated CDF is anticipated. The problems with the 1AC Power Cabinet do not increase the probability of a failure to drop the Group I rods associated with Control Bank A, Control Bank C and Shutdown Bank A rods upon a reactor trip. Therefore, no increase in the anticipated transient without scram (ATWS) contribution to the core damage frequency (CDF) is expected.

The NRC staff has reviewed the justification provided by Duke Energy Corporation. Based on the staff evaluation in Section 2.0 above, the staff concludes that the proposed change to TSSR 3.1.4.2 are acceptable. This conclusion is based on the following: (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) issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

### 3.0 STATEMENT OF EXIGENT CIRCUMSTANCES

The Commission's regulation, as stated in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.91, provides special exceptions for the issuance of amendments when the usual 30-day public notice cannot be met. One type of special exception is an exigency. An exigency exists when the staff and the licensee need to act quickly and time does not permit the staff to publish a *Federal Register* notice allowing 30 days for prior public comment, and the staff also determines that the amendment involves no significant hazards consideration. In accordance with 10 CFR 50.91(a)(6)(i)(B), the staff used local media to provide reasonable notice to the public in the area surrounding the McGuire Nuclear Station, of the proposed amendment and proposed finding of no significant hazards consideration, and reasonable opportunity to comment thereon. The notice was published in *Charlotte Observer*, North Carolina, September 2, 1999, and requested any comments be submitted by 4:15 p.m. on September 3, 1999, by telephone, facsimile, e-mail, or mail. No comments were received.

The licensee's August 27, 1999, submittal requests that an amendment be issued in a timely manner to support the proposed schedule for implementing the repairs and completing the TSSR 3.1.4.2 during the upcoming 1EOC13 refueling outage that is scheduled to begin on September 17, 1999.

Given the fact that the subject problem was discovered on August 21, 1999, less than 30 days exists for the normal comment period under 10 CFR 50.91. The normal surveillance period of TSSR 3.1.4.2 is 92 days, factoring in 25% grace as allowed by TS 3.0.2. The surveillance will be due on September 12, 1999. This allows only 22 days from the point of discovery until the point that the plant would be forced to shut down under the requirements of TS 3.0.3. Also, prior to the performance of the attempted surveillance on August 21, 1999, the rod control system had exhibited normal operation. As such, the licensee anticipated successful completion of the surveillance well within the 92-day surveillance period. The licensee could not have anticipated the need for a license amendment under these circumstances. In addition, the proposed amendment involves no significant hazards as specified under 10 CFR 50.92. Further, the licensee maintains that precluding the possibility of an unnecessary plant transient by implementing this one-time exigent amendment is in the best interests of the overall health and safety of the public.

On the basis of the above discussion, the staff has determined that exigent circumstances exist and that the licensee used its best efforts to make a timely application and did not cause the exigent situation.

### 4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulations in 10 CFR 50.92 state that the Commission may make a final determination that a license amendment involves no significant hazards considerations, if operation of the facility, in accordance with the amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (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.

The amendment has been evaluated against the three standards in 10 CFR 50.92(c). In its analysis of the issue of no significant hazards consideration, as required by 10 CFR 50.91(a), the licensee has provided the following:

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

No. Performance of the TSSR during power operations would result in a higher probability of an accident as compared to performing this testing during an outage. If performed at power, a trip could be initiated through the 1AC Power Cabinet while repairing or replacing components or through the inadvertent actuation of other rod control circuitry. For example, McGuire has experienced past reactor trips while performing maintenance on rod control and reactor trip circuitry at power. In addition, continuation of surveillance testing at power also introduces the potential for a reactor trip. McGuire PRA analyses indicate that reactor trips at power do contribute to the Core Damage Probability. For the proposed outage repairs and testing, adequate controls will be in place and the timing of the repairs/testing would be coordinated to prevent any negative consequences associated with a Rod Control System failure.

The equipment failure which affected movement of the Group I rods associated with Control Bank A, Control Bank C and Shutdown Bank A has not caused the affected rods to be inoperable. The intent of TSSR 3.1.4.2 is to, in lieu of tripping the reactor, verify rod movement in order to provide confidence that the control rods can trip the reactor. The BASES for that TSSR state that, if a control rod experiences movement problems, but remains trippable and aligned, the control rod is considered to be operable. All Unit 1 control rods currently satisfy the alignment criteria of TS 3.1.4 and TSSR 3.1.4.1. The BASES for TSSR 3.1.4.2 indicates that confidence as to the trippability of the control rod(s) can be obtained by verification that a rod movement problem is due to an electrical related control system failure and not the result of mechanical binding of the rods. The equipment failure which is preventing movement of some of the Unit 1 control rods is due to an electrical control system failure which does not affect the ability of the control rods to trip the reactor. There is no evidence of any mechanical binding of the rods.

As a result, the affected control rods are trippable. Since all Unit 1 control rods are trippable and properly aligned, they are operable and, in the absence of any other failures, should remain operable until repairs and surveillance testing can be effected in the 1EOC13 refueling outage.

The inability to move the Group I rods associated with Control Bank A, Control Bank C and Shutdown Bank A will not impact the ability to safely control the reactor during steady state power operations prior to the 1EOC13 refueling outage. The remaining unaffected control rods are sufficient for proper power distribution and temperature control under those plant conditions. In addition, plant procedures and processes will ensure the safe controlled shutdown of Unit 1 at the start of the 1EOC13 outage. McGuire PRA analyses indicate that a failure of the rod movement logic for a portion of the control rods does not directly contribute to the failure of any function modeled in the PRA. The control rod drive system impacts the McGuire PRA model directly only in its ability to cause a reactor trip and to release the rods when a reactor trip when required. The problems with the 1AC Power Cabinet may cause the control rods to respond to some transients differently from what

would normally be expected. Consequently, the failure increases the probability of a reactor trip for those events which would normally only result in a runback in reactor power. However, given the short time period of the extension and the relatively low frequency of transients that would be expected to cause a problem, no meaningful impact on the estimated CDF is anticipated. The problems with the 1AC Power Cabinet do not increase the probability of a failure to drop the Group I rods associated with Control Bank A, Control Bank C and Shutdown Bank A rods upon a reactor trip. Therefore, continued operation until repair and testing of the failed equipment during the 1EOC13 outage should not result in an increase in ATWS contribution to the CDF.

Note that the banks that have not been fully surveillance tested constitute approximately 98 percent of the total rod worth. However, the likelihood of any rod, much less all of these rods, not fully inserting is extraordinarily remote. In addition, McGuire Nuclear Station's design incorporates the AMSAC (ATWS Mitigation System Actuation Circuit) for the worst case such event. The worst case event is the failure of reactor tip breakers to open when called upon by a valid reactor tip signal. The current condition is clearly bounded by that postulated occurrence.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

No. No changes are being made to actual plant hardware or processes which will result in any new accident causal mechanisms. Also, no changes are being made to the way in which the plant is being operated. Therefore, no new accident causal mechanisms will be generated.

3. Does this change involve a significant reduction in a margin of safety?

No. Margin of safety is related to the ability of the fission product barriers to perform their design functions during and following accident conditions. These barriers include the fuel cladding, the reactor coolant system, and the containment system. Based upon the response to question #1, the performance of these barriers will not be degraded by the proposed changes.

The NRC staff has reviewed the licensee's analysis, and based on this review, has determined that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff finds that the amendment request involves no significant hazards consideration.

## 5.0 STATE CONSULTATION

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

## 6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 amendment involves 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 staff has made a final finding that the amendment involves no significant hazards consideration. Accordingly, the amendment meets 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 amendment.

## 7.0 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: M. Chatterton  
F. Rinaldi

Date: September 8, 1999