

November 5, 1987

Docket Nos.: 50-369  
and 50-370

Mr. H. B. Tucker, Vice President  
Nuclear Production Department  
Duke Power Company  
422 South Church Street  
Charlotte, North Carolina 28242

Dear Mr. Tucker:

Subject: Issuance of Amendment No.77 to Facility Operating License NPF-9 and  
Amendment No. 58 to Facility Operating License NPF-17 - McGuire  
Nuclear Station, Units 1 and 2 (TACS 65530/65531)

The Nuclear Regulatory Commission has issued the enclosed Amendment No.77 to  
Facility Operating License NPF-9 and Amendment No.58 to Facility Operating  
License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. These amend-  
ments consist of changes to the Technical Specifications in response to  
your application dated June 3, 1987.

The amendments change Technical Specification 3/4.1.3 "Movable Control  
Assemblies" and its Bases to provide a longer period of operation at power  
with inoperable but trippable control rods. The amendments also delete  
reference to a figure which had been left blank and will not be used.  
The amendments are effective as of their date of issuance.

A copy of the related safety evaluation supporting Amendment No.77 to Facility  
Operating License NPF-9 and Amendment No.58 to Facility Operating License NPF-17  
is enclosed.

Notice of issuance of amendments will be included in the Commission's next  
bi-weekly Federal Register notice.

Sincerely,



Darl Hood, Project Manager  
Project Directorate II-3  
Division of Reactor Projects I/II

Enclosures:

1. Amendment No.77 to NPF-9
2. Amendment No.58 to NPF-17
3. Safety Evaluation

cc w/enclosures: See next page

PDII-3/DRPI/II  
MDuncan/rad  
10/23/87

*KNS*  
PDII-3/DRPI/II  
DHood  
10/23/87

*Mcrocker*  
PDII-3/DRPI/II  
Acting Director  
10/2/87

Mr. H. B. Tucker  
Duke Power Company

McGuire Nuclear Station

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

DUKE POWER COMPANY

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 77  
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 Power Company (the licensee) dated June 3, 1987, 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, as amended, 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 attachments 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. 77, are hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

LS

Lawrence P. Crocker, Acting Director  
Project Directorate II-3  
Division of Reactor Projects I/II

Attachment:  
Technical Specification  
Changes

Date of Issuance: November 5, 1987

PDII-3/DRPI/II  
MDuncan/rad  
10/23/87

KNS  
PDII-3/DRPT/II  
DHood  
10/23/87

OGC-BETH  
10/2/87

Lawrence P. Crocker  
PDII-3/DRPI/II  
Acting PD  
10/2/87



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

DUKE POWER COMPANY

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 58  
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 Power Company (the licensee) dated June 3, 1987, 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, as amended, 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 attachments 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.58, are hereby incorporated into the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

151

Lawrence P. Crocker, Acting Director  
Project Directorate II-3  
Division of Reactor Projects I/II

Attachment:  
Technical Specification  
Changes

Date of Issuance: November 5, 1987

PDII-3/DRPI/II  
MDuncan/rad  
10/23/87

<sup>KNS</sup>  
PDII-3/DRPI/II  
for DHood  
10/23/87

OGC-Bethesda  
*[Signature]*  
10/26/87

*[Signature]*  
PDII-3/DRPI/II  
Acting Director  
11/10/87

ATTACHMENT TO LICENSE AMENDMENT NO. 77

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 58

FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

<u>Amended</u> <u>Page</u>	<u>Overleaf</u> <u>Page</u>
3/4 1-14	3/4 1-13
3/4 1-15	3/4 1-16
B 3/4 1-3a (new)	

REACTIVITY CONTROL SYSTEMS

SURVEILLANCE REQUIREMENTS

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4.1.2.6 Each borated water source shall be demonstrated OPERABLE:

- a. At least once per 7 days by:
  - 1) Verifying the boron concentration in the water,
  - 2) Verifying the contained borated water volume of the water source, and
  - 3) Verifying the Boric Acid Storage System solution temperature when it is the source of borated water.
- b. At least once per 24 hours by verifying the RWST temperature when the outside air temperature is either less than 70°F or greater than 100°F.



## REACTIVITY CONTROL SYSTEMS

### 3/4.1.3 MOVABLE CONTROL ASSEMBLIES

#### GROUP HEIGHT

#### LIMITING CONDITION FOR OPERATION

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3.1.3.1 All full-length shutdown and control rods shall be OPERABLE and positioned within  $\pm 12$  steps (indicated position) of their group step counter demand position.

APPLICABILITY: MODES 1\* and 2\*.

#### ACTION:

- a. With one or more full-length rods inoperable due to being immovable as a result of excessive friction or mechanical interference or known to be untrippable, determine that the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied within 1 hour and be in HOT STANDBY within 6 hours.
- b. With more than one full-length rod misaligned from the group step counter demand position by more than  $\pm 12$  steps (indicated position), be in HOT STANDBY within 6 hours.
- c. With one full-length rod trippable but inoperable due to causes other than addressed by ACTION a., above, or misaligned from its group step counter demand height by more than  $\pm 12$  steps (indicated position), POWER OPERATION may continue provided that within 1 hour:
  1. The rod is restored to OPERABLE status within the above alignment requirements, or
  2. The rod is declared inoperable and the remainder of the rods in the group with the inoperable rod are aligned to within  $\pm 12$  steps of the inoperable rod while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, or
  3. The rod is declared inoperable and the SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is satisfied. POWER OPERATION may then continue provided that:
    - a) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions;
    - b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours;

\*See Special Test Exceptions 3.10.2 and 3.10.3.

## REACTIVITY CONTROL SYSTEMS

### ACTION (Continued)

- c) A power distribution map is obtained from the movable incore detectors and  $F_Q(Z)$  and  $F_{\Delta H}^N$  are verified to be within their limits within 72 hours; and
  - d) The THERMAL POWER level is reduced to less than or equal to 75% of RATED THERMAL POWER within the next hour and within the following 4 hours the High Neutron Flux Trip Setpoint is reduced to less than or equal to 85% of RATED THERMAL POWER.
- d. With more than one full-length rod trippable but inoperable due to causes other than addressed by ACTION a above, POWER OPERATION may continue provided that:
- 1. Within 1 hour, the remainder of the rods in the bank(s) with the inoperable rods are aligned to within  $\pm 12$  steps of the inoperable rods while maintaining the rod sequence and insertion limits of Figure 3.1-1. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and
  - 2. The inoperable rods are restored to OPERABLE status within 72 hours.

### SURVEILLANCE REQUIREMENTS

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4.1.3.1.1 The position of each full-length rod shall be determined to be within the group demand limit by verifying the individual rod positions at least once per 12 hours except during time intervals when the Rod Position Deviation Monitor is inoperable, then verify the group positions at least once per 4 hours.

4.1.3.1.2 Each full-length rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

TABLE 3.1-1

ACCIDENT ANALYSES REQUIRING REEVALUATION  
IN THE EVENT OF AN INOPERABLE FULL-LENGTH ROD

Rod Cluster Control Assembly Insertion Characteristics

Rod Cluster Control Assembly Misalignment

Loss of Reactor Coolant from Small Ruptured Pipes or from Cracks in Large Pipes Which Actuates the Emergency Core Cooling System

Single Rod Cluster Control Assembly Withdrawal at Full Power

Major Reactor Coolant System Pipe Ruptures (Loss of Coolant Accident)

Major Secondary System Pipe Rupture

Rupture of a Control Rod Drive Mechanism Housing (Rod Cluster Control Assembly Ejection)

## REACTIVITY CONTROL SYSTEMS

### BASES

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#### MOVABLE CONTROL ASSEMBLIES (Continued)

For Specification 3.1.3.1 ACTIONS c. and d., it is incumbent upon the plant personnel to verify the trippability of the inoperable control rod(s). This may be by verification of a control system failure, usually electrical in nature, or that the failure is associated with the control rod stepping mechanism.

During performance of the Control Rod Movement periodic test (Specification 4.1.3.1.2), there have been some "Control Malfunctions" that prohibited a control rod bank or group from moving when selected, as evidenced by the demand counters and DRPI\*. In all cases, when the control malfunctions were corrected, the rods moved freely (no excessive friction or mechanical interference) and were trippable.

This surveillance test is an indirect method of verifying the control rods are not immovable or untrippable. It is highly unlikely that a complete control rod bank or bank group is immovable or untrippable. Past surveillance and operating history provide evidence of "trippability."

Based on the above information, during performance of the rod movement test, if a complete control rod bank or group fails to move when selected and can be attributed to a "Control Malfunction," the control rods can be considered "Operable" and plant operation may continue while ACTIONS c. and d. are taken.

If one or more control rods fail to move during testing (not a complete bank or group and cannot be contributed to a "Control Malfunction"), the affected control rod(s) shall be declared "Inoperable" and ACTION a. taken.

(Reference: W letter dated December 21, 1984, NS-NRC-84-2990, E. P. Rahe to Dr. C. O. Thomas)

\*Digital Rod Position Indicators



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 77 TO FACILITY OPERATING LICENSE NPF-9  
AND AMENDMENT NO. 58 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

DOCKET NOS. 50-369 AND 50-370

McGUIRE NUCLEAR STATION, UNITS 1 AND 2

INTRODUCTION

By letter dated June 3, 1987, Duke Power Company (the licensee) proposed amendments to revise Technical Specification (TS) 3/4.1.3 "Movable Control Assemblies" and its associated Bases 3/4.1.3. The change allows the unit to remain at power (Modes 1 or 2) for up to 72 hours with more than one full-length rod inoperable but trippable. Prior to this change, the TS did not distinguish between immovable rods and immovable but trippable rods, and with more than one full-length control rod immovable, the unit was required by Action Statements to be in hot standby within 6 hours.

The specific change is implemented by deleting "inoperable" from Action Statement b (which presently addresses both inoperable or misaligned rods), and addressing the "inoperable" requirement separately in a new Action Statement d. New Action Statement d requires that, with more than one full-length rod trippable but inoperable due to causes other than being immovable as a result of excessive friction or mechanical interference or known to be untrippable, power operation may continue provided that (1) within one hour, the remainder of the rods in the bank(s) with the inoperable rods are aligned to within  $\pm 12$  steps of the inoperable rods while maintaining the rod sequence and insertion limits of TS Figure 3.1-1, and providing that (2) thermal power level is restricted pursuant to TS 3.1.3.6 during subsequent operation. These two provisions regarding the remainder of the rods correspond to the previous and unchanged requirements of Action Statement c which addresses no more than one full-length rod trippable but inoperable for the same causes. New Action Statement d also includes a provision that (3) the inoperable rods are to be returned to operable status within 72 hours. The amendments also delete reference to Figure 3.1-2 in Action Statement c.

EVALUATION

By letter dated December 31, 1984, Westinghouse recommended generic revisions to TS 3/4.1.3 and its Bases regarding multiple immovable, but trippable, control rods. Westinghouse noted the experience at several different plants with its NSSS in which a group or several groups of control rods became immovable (would not step in or out) because of a rod control system failure. The licensee cited similar experiences during control rod movement

periodic tests in which control malfunctions prohibited a control rod bank or group from moving when selected, including a recent occurrence at Catawba Unit 2 when a fuse blew in the rod control circuitry. In all cases, the rods were still trippable, (i.e., these rods would have been inserted into the core in the event of a reactor trip signal and, thus, were fully capable of performing their intended safety function of shutting down the reactor). The NRC has previously accepted the Westinghouse recommended generic revision and has incorporated the change into the TS of several operating plants (e.g., Diablo Canyon and Joseph Farley) and into a proposed revision to the Standard Technical Specification (NUREG-0452). The additional time provided by the change to find and repair the cause of the rods' inoperability is justified because the rods are trippable.

TS 3.1.3.1, as revised by these amendments, continues to provide requirements to ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum shutdown margin is maintained with allowance for a stuck rod, (3) the potential effects of control rod misalignment on the associated safety analyses are acceptable, and (4) the trip reactivity assumed in the safety analysis will be available. Specifically, the revised TS requires that within one hour after entering the Action statement, the remainder of the control rods in the bank(s) with the inoperable rods are to be aligned to within  $\pm 12$  steps of the inoperable rods. This relates to ensuring conformance to items 1 and 3 above. Further, it is explicitly specified that the rod sequence and rod insertion limit TSs are to be maintained as applicable. This ensures conformance with items 2 and 4 above.

The effect of the above TS changes is to allow continued operation in the event of electrical failures which prevent movement of more than one control rod. Since the rods remain trippable and thus are capable of providing their safety function in shutting down the reactor, the changes have no adverse impact upon safety and are, therefore, acceptable.

In Attachment C to a letter dated December 21, 1984, from E. P. Rahe, Jr. (Westinghouse) to C. O. Thomas (NRC), a description of the movable control rod assembly mechanisms is provided along with a discussion of failures which may occur. This material provides guidance on the type of electrical failures which may render the control rod assemblies inoperable but still trippable. The licensee has referenced this material in the revised Bases 3.1.3.1 as previously requested by the staff.

Reference to Figure 3.1-2, which had been left blank pending NRC approval of three-loop operation, is deleted from TS 3.1.3.1 for consistency with TS 3.4.1.1 which prohibits part-loop operation, and because (as noted during prior Amendments 65 and 46) no approval of three-loop operation is pending. This administrative change has no adverse safety implication and is, therefore, acceptable.

### ENVIRONMENTAL CONSIDERATION

These amendments involve changes to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The 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 exposure. The NRC staff has made a determination that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. 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 these amendments.

### CONCLUSION

The Commission made proposed determinations that the amendments involve no significant hazards consideration which were published in the Federal Register (52 FR 26584) on July 15, 1987 and (52 FR 9566) on March 25, 1987. The Commission consulted with the state of North Carolina. No public comments were received, and the state of North Carolina did not have any comments.

We have 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, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Darl S. Hood, PDII-3/DRPI/II  
L. Kopp, SRXB

Dated: November 5, 1987

DATED: November 5, 1987

AMENDMENT NO. 77 TO FACILITY OPERATING LICENSE NPF-9 - McGuire Nuclear Station, Unit 1  
AMENDMENT NO. 58 TO FACILITY OPERATING LICENSE NPF-17 - McGuire Nuclear Station, Unit 2

DISTRIBUTION:

Docket File 50-369/370

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