

July 29, 1994

Docket Nos. 50-369
and 50-370

Mr. T. C. McMeekin
Vice President, McGuire Site
Duke Power Company
12700 Hagers Ferry Road
Huntersville, North Carolina 28078-8985

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L.Berry

Dear Mr. McMeekin:

SUBJECT: ISSUANCE OF AMENDMENTS - McGUIRE NUCLEAR STATION, UNITS 1 AND 2
(TAC NOS. M88258 AND M88259)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 145 to Facility Operating License NPF-9 and Amendment No. 127 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 11, 1993, as supplemented on June 13, 1994.

The amendments revise the TS surveillance requirements for the emergency core cooling system subsystems.

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,

Original signed by:
Robert Martin for:
Victor Nerses, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 145 to NPF-9
2. Amendment No. 127 to NPF-17
3. Safety Evaluation

cc w/enclosures:
See next page

OFFICE	PDII-3/LA	PDII-3/PM	OGC	with changes	PDII-BVA
NAME	L. BERRY	V. NERSES	CPW	with changes	H. BERKOW
DATE	7/18/94	7/18/94	7/17/94		7/29/94

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

July 29, 1994

Docket Nos. 50-369
and 50-370

Mr. T. C. McMeekin
Vice President, McGuire Site
Duke Power Company
12700 Hagers Ferry Road
Huntersville, North Carolina 28078-8985

Dear Mr. McMeekin:

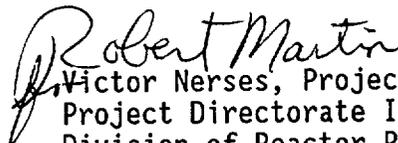
SUBJECT: ISSUANCE OF AMENDMENTS - McGUIRE NUCLEAR STATION, UNITS 1 AND 2
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Victor Nerses, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation.

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3. Safety Evaluation

cc w/enclosures:
See next page

Mr. T. C. McMeekin
Duke Power Company

McGuire Nuclear Station

cc:

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

DUKE POWER COMPANY

DOCKET NO. 50-369

McGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 145
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 (licensee) dated November 11, 1993, as supplemented on June 13, 1994, 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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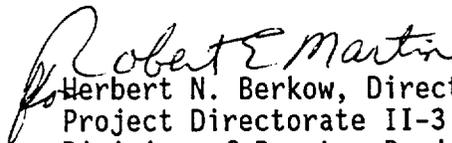
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-9 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 145, are hereby incorporated into this 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


Herbert N. Berkow, Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: July 29, 1994



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

DUKE POWER COMPANY

DOCKET NO. 50-370

McGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 127
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 (licensee) dated November 11, 1993, as supplemented on June 13, 1994, 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.

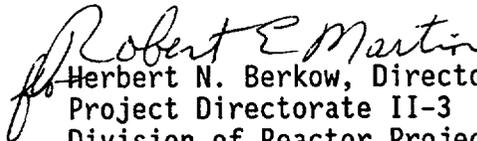
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-17 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 127 , are hereby incorporated into this 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


Herbert N. Berkow, Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: July 29, 1994

ATTACHMENT TO LICENSE AMENDMENT NO. 145

FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

TO LICENSE AMENDMENT NO. 127

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.

Remove Pages

3/4 5-7
3/4 5-8

Insert Pages

3/4 5-7
3/4 5-8

SURVEILLANCE REQUIREMENTS (Continued)

- 2) A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.
- e. At least once per 18 months, during shutdown, by:
- 1) Verifying that each automatic valve in the flow path actuates to its correct position on Safety Injection actuation and automatic switchover to Containment Sump Recirculation test signals, and
 - 2) Verifying that each of the following pumps start automatically upon receipt of a Safety Injection actuation test signal:
 - a) Centrifugal charging pump,
 - b) Safety Injection pump, and
 - c) RHR pump.
- f. By verifying that each of the following pumps develops the indicated differential pressure when tested pursuant to Specification 4.0.5:
- 1) Centrifugal charging pump ≥ 2347 psid,
 - 2) Safety Injection pump ≥ 1418 psid, and
 - 3) RHR pump ≥ 166 psid.
- g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:
- 1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and

SURVEILLANCE REQUIREMENTS (Continued)

2) At least once per 18 months.

<u>Boron Injection Throttle Valves</u>	<u>Safety Injection Throttle Valves</u>
<u>Valve Number</u>	<u>Valve Number</u>
NI-480	NI-488
NI-481	NI-489
NI-482	NI-490
NI-483	NI-491

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

1) For centrifugal charging pump lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 325 gpm for Unit 1 and 320 gpm for Unit 2, and

b) The total pump flow rate is less than or equal to 560 gpm.

2) For Safety Injection pump lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 423 gpm, and

b) The total pump flow rate is less than or equal to 675 gpm.

3) For RHR pump lines, with a single pump running, the sum of the injection line flow rates is greater than or equal to 4025 gpm.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 145 TO FACILITY OPERATING LICENSE NPF-9
AND AMENDMENT NO. 127 TO FACILITY OPERATING LICENSE NPF-17

DUKE POWER COMPANY

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By letter dated November 11, 1993, as supplemented on June 13, 1994, Duke Power Company (the licensee or DPC) submitted a request for changes to the McGuire Nuclear Station, Units 1 and 2, Technical Specifications (TS). The requested changes would revise the TS surveillance requirements for the emergency core cooling system (ECCS) subsystems. These changes are needed to ensure that the TS correctly reflect the appropriate operability requirements and surveillance requirement values for the ECCS subsystems. The proposed TS changes would:

- (1) Revise the minimum developed head requirement of the centrifugal charging pumps (CCPs), the safety injection pumps (SIPs) and the residual heat removal pumps (RHRPs).
- (2) Revise the sum of the minimum injection flow rates for the CCPs, SIPs and the RHRPs.
- (3) Revise the total maximum pump flowrate (runout limit) for the CCPs and the SIPs.

These changes are to prevent possible cavitation problems at runout conditions during a loss of cooling accident (LOCA). Additional information was obtained in the letter of June 13, 1994 (Reference 2).

It was proposed that the following ECCS subsystem surveillance requirements be revised:

- (1) Increase the centrifugal charging pump minimum developed head requirement given in surveillance 4.5.2.f.1 from 2,339 psid to 2,347 psid.
- (2) Decrease the safety injection pump minimum developed head requirement given in surveillance 4.5.2.f.2 from 1,454 psid to 1,418 psid.
- (3) Decrease the RHR minimum head developed head requirement given in surveillance 4.5.2.f.3 from 169 psid to 166 psid.

- (4) For the centrifugal charging pump lines, with a single pump running: decrease the sum of the injection line flow rates, excluding the highest flow rate, given in surveillance 4.5.2.h.1.a from 335 gpm to 325 gpm for Unit 1 and 320 gpm for Unit 2.
- (5) For the centrifugal charging pump lines, with a single pump running: decrease the total pump flow rate, given in surveillance 4.5.2.h.1.b from 565 gpm to 560 gpm.
- (6) For the safety injection pumps, with a single pump running: increase the sum of the injection line flow rates, excluding the highest flow rate, given in surveillance 4.5.2.h.2.a from 405 gpm to 423 gpm.
- (7) For the safety injection pumps, with a single pump running: increase the total pump flow rate given in surveillance 4.5.2.h.2.b from 660 gpm to 675 gpm.
- (8) For the residual heat removal pump lines with a single pump running, increase the sum of the injection line flow rates given in surveillance 4.5.2.h.3 from greater than or equal to 3,975 gpm to greater than or equal to 4,025 gpm.

The June 13, 1994, supplemental letter provided clarifying and additional information that did not change the scope of the November 11, 1993, application and the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

2.1 ECCS Surveillance Requirements

By letters dated November 11, 1993 (Reference 1) and June 13, 1994 (Reference 2), DPC stated that it was notified by Westinghouse and Dresser/Pacific Pumps, in letters DAP-91-074 and DCP-91-074 (Reference 4) of changes in the generic runout limits for the centrifugal charging and safety injection pumps utilized at the McGuire and Catawba Nuclear Stations. These changes were related to pump cavitation and motor horsepower capability.

The implementation of this information resulted in changes which decreased the centrifugal charging pump (CCP) runout limit from 565 gpm to 560 gpm, and increased the safety injection pump (SIP) runout limit from 660 gpm to 675 gpm. The Westinghouse and Dresser/Pacific letters discussed cavitation and NPSH requirements for the CCPs and the SIPs and recommended a NPSH of 30 feet in order to support runout limits of 560 and 675 gpm for the CCPs and SIPs, respectively. In consideration of this information, DPC proposed surveillance requirements to stay within the recommended NPSH limits provided by the pump vendor. The licensee stated (Reference 2) that the available NPSH values for the SIPs and CCPs for the most limiting conditions as listed in the Final Safety Analysis Report (FSAR) is 45.3 feet for the CCPs and 48.3 feet for the SIPs which well exceeds the 30 foot requirement.

Historically, the centrifugal charging and safety injection systems were configured by DPC via flow balance to: 1) preclude pump runout based on an injection mode alignment (suction source is the refueling water storage tank); and 2) provide minimum injected flows assumed in the LOCA analysis. During the recirculation phase of a LOCA, credit was taken for the increased suction boost supplied to the CCPs and SIPs by the residual heat removal (RHR) pumps. The increased suction boost was initially assumed to extend the runout limits of the CCPs and SIPs to beyond 565 and 660 gpm respectively. The information provided by Westinghouse and Dresser/Pacific Pumps indicated that credit could not be taken for an increased pump runout limit due to excess suction pressure, since cavitation is expected to occur in the second stage of the pumps for flowrates above the proposed runout limits.

For the short-term, where runout was predicted to occur, credit was taken for plant data that supported runout flowrates in excess of the proposed generic runout limits and procedures for defining reactor coolant pump seal flow were revised. For the long-term solution, it was determined that the centrifugal charging and safety injection flow balance requirements would need to be revised such that runout during the injection and recirculation phases of a LOCA would be prevented.

Pump head curves were used to support the following proposed TS changes both for runout conditions and for LOCA flow predictions. For conservatism, the strongest plant data CCP and SIP head curves were selected in evaluating runout conditions for the proposed TS changes. Also, for conservatism in developing the LOCA injected flow predictions, the weakest CCP and SIP plant data head curves were selected.

For the centrifugal charging pump lines, with a single pump running: the minimum developed head requirement in surveillance 4.5.2.f.1) was increased from 2,339 psid to 2,347 psid; the sum of the injection line flow rates, excluding the highest flow rate, given surveillance 4.5.2.h.a) was decreased from 335 gpm to 325 gpm for Unit 1 and 320 gpm for Unit 2; and the total pump flow rate given in surveillance 4.5.2.h.1)b) was decreased from 565 gpm to 560 gpm.

For the safety injection pump lines, with a single pump running: the minimum developed head requirement given in surveillance 4.5.2.f.2) was decreased from 1,454 psid to 1,418 psid; the sum of the injection pump line flow rates, excluding the highest flow rate given in surveillance requirement 4.5.2.h.2)b) was increased from 405 gpm to 423 gpm; and the total pump flow rate given in surveillance requirement 4.5.2.h.2)b) was increased from 660 gpm to 675 gpm.

The proposed TS changes were outside the assumption for ECCS performance during a LOCA for the previous LOCA analysis. Therefore, a new LOCA analysis was performed in accordance with NRC-approved LOCA methodology. This included reanalysis for Large and Small Break LOCA design basis events with ECCS injection flow rates that reflect the proposed changes to the TS surveillance requirements. The LOCA reanalysis was performed by Westinghouse using the approved LOCA methodologies given in WCAP-1026 (Reference 6) and WCAP-10054 (Reference 7). The calculated peak clad temperature (PCT) for the Large Break

LOCA was 1945 °F and for the Small Break LOCA the value was 1264 °F. These values meet the 10 CFR 50.46(b)(1) acceptance criteria.

The residual heat removal (RHR) pump head curve that supports the proposed TS changes was based upon the weakest vendor data for RHR head curve with additional degradation of approximately 12%. This head curve bounds the weakest RHR pump at McGuire Nuclear Station or Catawba Nuclear Station. For the RHR pump lines, with a single pump running: the minimum developed head requirement given in surveillance 4.5.2.f.3 was decreased from 169 psid to 166 psid; and the sum of the injection line flow rates given in surveillance requirement 4.5.2.h.3 was increased from 3975 gpm to 4025 gpm.

In response to a question on the impact of increased RHR flow rate on vortexing during mid-loop operation, the licensee said that there would be no impact. The licensee stated that the RHR flow rate during mid-loop operation will continue to be limited to 3,000 gpm as described in Reference 5.

The staff has found the changes to the surveillance requirements of TSs 4.5.2.f.1, 4.5.2.f.2, 4.5.2.h.1a, 4.5.2.h.2a, and 4.5.2.h.3 to be acceptable as they are based on meeting the pump manufacturers' requirements by preventing possible runout conditions during a LOCA event and also meeting the LOCA flow requirements for core cooling.

The staff has reviewed the licensee's submittals to support changes to the McGuire TS affecting the ECCS subsystem surveillance requirements and found them to be acceptable as discussed in Section 2.0.

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 or change surveillance requirements. 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 (59 FR 17597 dated April 13, 1994). 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.

Principal Contributor: H. Balukjian

Date: July 29, 1994

REFERENCES

1. Letter from T. C. McMeekin (DPC) to USNRC, dated November 11, 1993.
2. Letter from T. C. McMeekin (DPC) to USNRC, dated June 13, 1994.
3. Letter from D. L. Rehn (DPC) to USNRC, dated November 15, 1993.
4. DAP-91-074, DCP-91-074, D. L. Fuller (Westinghouse) to R. C. Futrell (Duke), "Emergency Core Cooling System Pump Runout Limit Issues," October 3, 1991.
5. McGuire Nuclear Station Procedures OP/1/A/6200/04 and OP/2/A/6200/04.
6. Kabadi, J. N. et al, "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," WCAP-10054-P-A, August 1985.
7. N. Lee, et al, "Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code," WCAP-10054-P-A, August 1985.