

December 15, 1993

Docket Nos. 50-413
and 50-414

Mr. David L. Rehn
Vice President, Catawba Site
Duke Power Company
4800 Concord Road
York, South Carolina 29745

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Dear Mr. Rehn:

SUBJECT: ISSUANCE OF AMENDMENTS - CATAWBA NUCLEAR STATION, UNITS 1 AND 2
(TAC NOS. M87867 AND M87868)

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 110 to Facility Operating License NPF-35 and Amendment No. 104 to Facility Operating License NPF-52 for the Catawba Nuclear Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated October 5, 1993, as supplemented November 15 and 22, 1993.

The amendments revise the TS to reflect the appropriate operability requirements for cold leg accumulator water volume and surveillance requirements values for the centrifugal charging pumps, safety injection pumps, and residual heat removal pumps to prevent possible runout conditions during a loss of coolant accident event.

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,

/s/

Robert E. Martin, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 110 to NPF-35
2. Amendment No. 104 to NPF-52
3. Safety Evaluation

cc w/enclosures:
See next page

OFFICE	PDII-3/IA	PDII-3/PM	OGC	(A)D/PM	PDII-3
NAME	L. BERRY	R. MARTIN	SE Tunde	L. PLISCO	
DATE	12/9/93	12/9/93	12/14/93	12/15/93	

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 15, 1993

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and 50-414

Mr. David L. Rehn
Vice President, Catawba Site
Duke Power Company
4800 Concord Road
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Sincerely,

A handwritten signature in cursive script that reads "Robert E. Martin".

Robert E. Martin, Project Manager
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 110 to NPF-35
2. Amendment No. 104 to NPF-52
3. Safety Evaluation

cc w/enclosures:
See next page

Mr. David L. Rehn
Duke Power Company

Catawba Nuclear Station

cc:

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

DUKE POWER COMPANY

NORTH CAROLINA ELECTRIC MEMBERSHIP CORPORATION

SALUDA RIVER ELECTRIC COOPERATIVE, INC.

DOCKET NO. 50-413

CATAWBA NUCLEAR STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 110
License No. NPF-35

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Catawba Nuclear Station, Unit 1 (the facility) Facility Operating License No. NPF-35 filed by the Duke Power Company, acting for itself, North Carolina Electric Membership Corporation and Saluda River Electric Cooperative, Inc. (licensees), dated October 5, 1993, as supplemented November 15 and 22, 1993, 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-35 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 110 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Duke Power Company 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



Loren R. Plisco, Acting Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: December 15, 1993



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

DUKE POWER COMPANY

NORTH CAROLINA MUNICIPAL POWER AGENCY NO. 1

PIEDMONT MUNICIPAL POWER AGENCY

DOCKET NO. 50-414

CATAWBA NUCLEAR STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 104
License No. NPF-52

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Catawba Nuclear Station, Unit 2 (the facility) Facility Operating License No. NPF-52 filed by the Duke Power Company, acting for itself, North Carolina Municipal Power Agency No. 1 and Piedmont Municipal Power Agency (licensees), dated October 5, 1993, as supplemented November 15 and 22, 1993, 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.

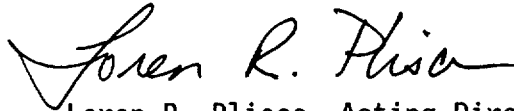
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Facility Operating License No. NPF-52 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 104 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Duke Power Company 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



Loren R. Plisco, Acting Director
Project Directorate II-3
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: December 15, 1993

ATTACHMENT TO LICENSE AMENDMENT NO. 110

FACILITY OPERATING LICENSE NO. NPF-35

DOCKET NO. 50-413

AND

TO LICENSE AMENDMENT NO. 104

FACILITY OPERATING LICENSE NO. NPF-52

DOCKET NO. 50-414

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

Insert Pages

3/4 5-1

3/4 5-1

3/4 5-7

3/4 5-7

3/4 5-8

3/4 5-8

3/4.5 EMERGENCY CORE COOLING SYSTEMS

3/4.5.1 ACCUMULATORS

COLD LEG INJECTION

LIMITING CONDITION FOR OPERATION

3.5.1 Each cold leg injection accumulator shall be OPERABLE with:

- a. The discharge isolation valve open,
- b. A contained borated water volume of between 7630 and 8079 gallons,
- c. A boron concentration of between 1900 and 2100 ppm,
- d. A nitrogen cover-pressure of between 585 and 678 psig, and
- e. A water level and pressure channel OPERABLE.

APPLICABILITY: MODES 1, 2, and 3*.

ACTION:

- a. With one cold leg injection accumulator inoperable, except as a result of a closed isolation valve or boron concentration less than 1900 ppm, restore the inoperable accumulator to OPERABLE status within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.
- b. With one cold leg injection accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.
- c. With one accumulator inoperable due to boron concentration less than 1900 ppm and:
 - 1) The volume weighted average boron concentration of the accumulators 1900 ppm or greater, restore the inoperable accumulator to OPERABLE status within 24 hours of the low boron determination or be in at least HOT STANDBY within the next 6 hours and reduce Reactor Coolant System pressure to less than 1000 psig within the following 6 hours.
 - 2) The volume weighted average boron concentration of the accumulators less than 1900 ppm but greater than 1800 ppm, restore the inoperable accumulator to OPERABLE status or return the volume weighted average boron concentration of the accumulators to greater than 1900 ppm and

*Reactor Coolant System pressure above 1000 psig.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- b) With a simulated or actual Reactor Coolant System pressure signal less than or equal to 660 psig the interlocks will cause the valves to automatically close.
- 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 and Containment Sump Recirculation test signals, and
 - 2) Verifying that each of the following pumps start automatically upon receipt of a Safety Injection test signal:
 - a) Centrifugal charging pump,
 - b) Safety Injection pump, and
 - c) Residual heat removal 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 \geq 2349 psid,
 - 2) Safety Injection pump \geq 1418 psid, and
 - 3) Residual heat removal pump \geq 165 psid.
- g. By verifying the correct position of each electrical and/or mechanical 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
 - 2) At least once per 18 months.

Centrifugal
Charging Pump
Injection Throttle
Valve Number

Safety Injection Throttle
Valve Number

NI-14
NI-16
NI-18
NI-20

NI-164
NI-166
NI-168
NI-170

**This surveillance need not be performed until prior to entering HOT SHUTDOWN following the Unit One first refueling.

SURVEILLANCE REQUIREMENTS (Continued)

- 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 320 gpm, 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 residual heat removal pump lines, with a single pump running, the sum of the injection line flow rates is greater than or equal to 3900 gpm.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 110 TO FACILITY OPERATING LICENSE NPF-35
AND AMENDMENT NO. 104 TO FACILITY OPERATING LICENSE NPF-52

DUKE POWER COMPANY, ET AL.

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

By letter dated October 5, 1993, as supplemented November 15 and 22, 1993, Duke Power Company, et al. (the licensee), submitted a request for changes to the Catawba Nuclear Station, Units 1 and 2, Technical Specifications (TS). The requested changes would revise the TS to reflect the appropriate operability requirements for cold leg accumulator water volume and surveillance requirements values for the centrifugal charging pumps, safety injection pumps, and residual heat removal pumps to prevent possible runout conditions during a loss of coolant accident event. The November 15 and 22, 1993, letters provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

It was proposed that the cold leg accumulator (CLA) contained borated water volume requirement given in TS 3.5.1.b, be revised from between 7,704 and 8,004 gallons to between 7,630 and 8,079 gallons. The proposed change would begin with the operation of Catawba Unit 1 Cycle 8 and apply to Units 1 and 2.

It was also proposed that the following ECCS subsystem surveillance requirements be revised beginning with operation of Catawba Unit 1 Cycle 8 and apply to Units 1 and 2:

- (1) Increase the centrifugal charging pump minimum developed head requirement given in surveillance 4.5.2.f.1) from 2,223 psid to 2,349 psid.
- (2) Increase the safety injection pump minimum developed head requirement given in surveillance 4.5.2.f.2) from 1,341 psid to 1,418 psid.
- (3) For the centrifugal charging pumps, decrease the sum of the injection line flow rates, excluding the highest flow rate, given in surveillance 4.5.2.h.1)a) from 345 gpm to 320 gpm.

- (4) For the safety injection pumps, decrease the sum of the injection line flow rates, excluding the highest flow rate, given in surveillance 4.5.2.h.2)a) from 450 gpm to 423 gpm.
- (5) For the residual heat removal pump lines with a single pump running, increase the sum of the injection line flow rates (all lines) given in surveillance 4.5.2.h.3) from 3,648 gpm to 3,900 gpm.

2.1 Cold Leg Accumulator

The CLAs are part of a passive system that ensures a sufficient volume of borated water will be immediately forced into the reactor core in the event the Reactor Coolant System (RCS) falls below the pressure of the accumulators. The proposed TS change only affects the allowable water volume band of the CLAs. The previous loss of coolant accident (LOCA) analysis for Catawba Units 1 and 2 supported a CLA water volume uncertainty of $\pm 20 \text{ ft}^3$. The most recent LOCA analysis performed in accordance with NRC-approved methodology for the McGuire and Catawba Nuclear Stations justifies a CLA water volume uncertainty of $\pm 30 \text{ ft}^3$. The volume range of 7,630 to 8,079 gallons, which is the requested change, corresponds to a tolerance of $\pm 30 \text{ ft}^3$. Increasing the Catawba CLA tolerance to $\pm 30 \text{ ft}^3$ will provide more operating margin on the CLAs, with potentially less entrances into the action statement for TS 3.5.1. The staff finds this change in tolerance acceptable as the results of the LOCA analysis performed utilizing the larger water volume band on the CLAs indicates that all accident analysis requirements are satisfied.

2.2 ECCS Surveillance Requirements

In the letter of November 15, 1993 (Reference 2), the licensee stated that they were notified by Westinghouse and Dresser/Pacific Pumps in a letter dated October 3, 1991 (Attachment 1 to Reference 3), of changes in the generic runout limits for 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 licensee was informed of changes based on review of pump designs with sand cast and investment cast impellers and consideration of recent information on impeller net positive suction head (NPSH) margin to avoid cavitation. The investment cast impellers were found to have somewhat lower NPSH requirements and are able to operate at higher runout flows than the sand cast impellers. Another consideration was avoidance of extended operation under conditions that would cause motor overheating. The implementation of this information resulted in changes which decreased the centrifugal charging pump (CCP) runout limit from 564 gpm to 560 gpm, and increased the safety injection pump (SIP) runout limit from 660 gpm to 675 gpm. Westinghouse and Dresser/Pacific recommended a NPSH of 30 feet (Reference 3) in order to support runout limits of 560 and 675 gpm of the CCPs and SIPs, respectively. In consideration of this information, the licensee has proposed surveillance requirements to stay within the recommended NPSH limits provided by the pump vendor. The licensee stated (Reference 2) that the available NPSH for each is approximately 60 ft. which well exceeds the 30 ft. requirement. Previously, administrative limits were instituted until a TS change could be developed.

Pump head curves that support the proposed TS changes were selected from the most recent McGuire Nuclear Station (MNS) and Catawba Nuclear Station (CNS) CCP and SIP head curve data. The strongest CCP and SIP head curves were selected in evaluating runout conditions for the proposed TS changes for conservatism. The weakest CCP and SIP head curves were selected for developing the LOCA injected flow predictions. For the CCP lines, with a single pump running, the minimum developed head requirement in surveillance 4.5.2.f.1) was increased from 2,223 psid to 2,349 psid, and the sum of the injection line flow rates, excluding the highest flow rate, given surveillance 4.5.2.h.1)a) was decreased from 345 gpm to 320 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 increased from 1,341 psid to 1,418 psid, and the sum of the injection pump line flow rates, excluding the highest flow rate, was decreased from 450 gpm to 423 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 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 RHR head curve with additional degradation of approximately 12%. This head curve bounds the weakest RHR pump at MNS or CNS. For the RHR pump lines, with a single pump running, the sum of the injection line flow rates was changed from 3,648 gpm to 3,900 gpm in surveillance requirement 4.5.2.h.3). In response to a question on the impact of increased RHR flow rate on vortexing during mid-loop operation, the licensee stated that there would be no impact. It was also stated that the latest RHR injected flow test data, which is corrected for uncertainties, indicates the 3,900 gpm proposed for the TS will be acceptable as the licensee has information that indicates that there is no vortexing at a RHR flow rate of 4,000 gpm..

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

The staff has reviewed the licensee's submittal to support changes to the Catawba TS affecting the cold leg accumulator contained borated water volume and ECCS subsystem surveillance requirements and finds it acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the South 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 and 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 (58 FR 57848 dated October 27, 1993). 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, SRXB

Date: December 15, 1993

REFERENCES

1. Letter from D. L. Rehn (DPC) to USNRC, dated October 5, 1993.
2. Letter from D. L. Rehn (DPC) to USNRC, dated November 15, 1993.
3. Letter from D. L. Rehn (DPC) to USNRC, dated November 22, 1993, with attached letter: 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.