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

October 4, 2000

Mr. G. R. Peterson
Site Vice President
Catawba Nuclear Station
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2 RE: ISSUANCE OF AMENDMENTS (TAC NOS. MA9067 AND MA9068)

Dear Mr. Peterson:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 189 to Facility Operating License NPF-35 and Amendment No. 182 to Facility Operating License NPF-52 for Catawba Nuclear Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated May 25, 2000, as supplemented by letters dated July 31, August 8, and August 17, 2000.

The amendments temporarily revise TS 3.5.2, "Emergency Core Cooling System;" TS 3.6.6, "Containment Spray System;" TS 3.6.17, "Containment Valve Injection Water System;" TS 3.7.5, "Auxiliary Feedwater System;" TS 3.7.7, "Component Cooling Water System;" TS 3.7.8, "Nuclear Service Water System;" TS 3.7.10, "Control Room Area Ventilation System;" TS 3.7.12, "Auxiliary Building Filtered Ventilation Exhaust System;" and TS 3.8.1, "AC Sources."

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,

Chandu P. Patel

Chandu P. Patel, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-413 and 50-414

Enclosures:
1. Amendment No. 189 to NPF-35
2. Amendment No. 182 to NPF-52
3. Safety Evaluation

cc w/encls: See next page

October 4, 2000

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/RA/

Chandu P. Patel, Project Manager, Section 1
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Office of Nuclear Reactor Regulation

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cc w/encls: See next page

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with comments

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w/comments

Catawba Nuclear Station

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Catawba Nuclear Station

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

DUKE ENERGY CORPORATION

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. 189
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 Energy Corporation, acting for itself, North Carolina Electric Membership Corporation and Saluda River Electric Cooperative, Inc. (licensees), dated May 25, 2000, as supplemented by letters dated July 31, August 8, and August 17, 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-35 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 189 , which are attached hereto, are hereby incorporated into this license. Duke Energy Corporation 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.

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: October 4, 2000

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

DUKE ENERGY CORPORATION

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. 182
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 Energy Corporation, acting for itself, North Carolina Municipal Power Agency No. 1 and Piedmont Municipal Power Agency (licensees), dated May 25, 2000, as supplemented by letters dated July 31, August 8, and August 17, 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-52 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 182 , which are attached hereto, are hereby incorporated into this license. Duke Energy Corporation 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.

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: October 4, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 189

FACILITY OPERATING LICENSE NO. NPF-35

DOCKET NO. 50-413

AND LICENSE AMENDMENT NO. 182

FACILITY OPERATING LICENSE NO. NPF-52

DOCKET NO. 50-414

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

Remove	Insert
3.5.2-1	3.5.2-1
3.6.6-1	3.6.6-1
3.6.17-1	3.6.17-1
3.7.5-1	3.7.5-1
3.7.7-1	3.7.7-1
3.7.8-1	3.7.8-1
3.7.10-1	3.7.10-1
3.7.12-1	3.7.12-1
3.8.1-1	3.8.1-1
3.8.1-3	3.8.1-3

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS — Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE*.

APPLICABILITY: MODES 1, 2, and 3.

----------NOTE----------
In MODE 3, both safety injection (SI) pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve testing per SR 3.4.14.1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more trains inoperable. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	A.1 Restore train(s) to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

*For each ECCS train on Unit 2, the Completion Time that one ECCS train can be inoperable as specified by Required Action A.1 may be extended beyond the 72 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with cleaning of NSWS piping, valves and branch lines, necessary repairs and/or replacement, valve repair and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE*.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	31 days

(continued)

*For each CSS train on Unit 2, the Completion Time that one CSS train can be inoperable as specified by Required Action A.1 may be extended beyond the 72 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.6 CONTAINMENT SYSTEMS

3.6.17 Containment Valve Injection Water System (CVIWS)

LCO 3.6.17 Two CVIWS trains shall be OPERABLE*.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CVIWS train inoperable.	A.1 Restore CVIWS train to OPERABLE status.	7 days*
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.17.1 Verify system surge tanks pressure is ≥ 36.4 psig.	31 days
SR 3.6.17.2 Verify valve injection flow rate is < 1.29 gpm (Unit 1) < 1.21 gpm (Unit 2) for Train A and < 1.16 gpm for Train B with a surge tank pressure ≥ 36.4 psig.	18 months
SR 3.6.17.3 Verify each automatic valve actuates to its correct position on an actual or simulated actuation signal.	18 months

*For each CVIWS train on Unit 2, the Completion Time that one CVIWS train can be inoperable as specified by Required Action A.1 may be extended beyond the 168 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE*.

----------NOTE----------
Only one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable.	A.1 Restore steam supply to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO
B. One AFW train inoperable in MODE 1, 2 or 3 for reasons other than Condition A.	B.1 Restore AFW train to OPERABLE status.	72 hours* AND 10 days* from discovery of failure to meet the LCO

(continued)

*For each AFW train on Unit 2, the Completion Time that one AFW train can be inoperable as specified by Required Action A.1 may be extended beyond the "72 hours and 10 days from discovery of failure to meet the LCO" up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.7 PLANT SYSTEMS

3.7.7 Component Cooling Water (CCW) System

LCO 3.7.7 Two CCW trains shall be OPERABLE*.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by CCW. ---------- Restore CCW train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3.	6 hours
	AND	
	B.2 Be in MODE 5.	36 hours

*For each CCW train on Unit 2, the Completion Time that one CCW train can be inoperable as specified by Required Action A.1 may be extended beyond the 72 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.7 PLANT SYSTEMS

3.7.8 Nuclear Service Water System (NSWS)

LCO 3.7.8 Two NSWS trains shall be OPERABLE*.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One NSWS train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources—Operating," for emergency diesel generator made inoperable by NSWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by NSWS. ---------- Restore NSWS train to OPERABLE status.	72 hours*

(continued)

*For each NSWS train on Unit 2, the Completion Time that one NSWS train can be inoperable as specified by Required Action A.1 may be extended beyond the 72 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.7 PLANT SYSTEMS

3.7.10 Control Room Area Ventilation System (CRAVS)

LCO 3.7.10 Two CRAVS trains shall be OPERABLE*.

----------NOTE----------
The control room pressure boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies,
During CORE ALTERATIONS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CRAVS train inoperable.	A.1 Restore CRAVS train to OPERABLE status.	7 days*
B. Two CRAVS trains inoperable due to inoperable control room pressure boundary in MODES 1, 2, 3, or 4.	B.1 Restore control room pressure boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

(continued)

*For each CRAVS train, the Completion Time that one CRAVS train can be inoperable as specified by Required Action A.1 may be extended beyond the 168 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.7 PLANT SYSTEMS

3.7.12 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)

LCO 3.7.12 Two ABFVES trains shall be OPERABLE*.

----------NOTE----------
The ECCS pump rooms pressure boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ABFVES train inoperable.	A.1 Restore ABFVES train to OPERABLE status.	7 days*
B. Two ABFVES trains inoperable due to inoperable ECCS pump rooms pressure boundary.	B.1 Restore ECCS pump rooms pressure boundary to OPERABLE status.	24 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. One or more ABFVES train(s) heater inoperable.	D.1 Restore ABFVES train(s) heater to OPERABLE status. OR D.2 Initiate action in accordance with Specification 5.6.6.	7 days 7 days

*For each ABFVES train on Unit 2, the Completion Time that one ABFVES train can be inoperable as specified by Required Action A.1 may be extended beyond the 168 hours up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources—Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE*:

a. Two qualified circuits between the offsite transmission network and the Onsite Essential Auxiliary Power System; and

b. Two diesel generators (DGs) capable of supplying the Onsite Essential Auxiliary Power Systems;

AND

The automatic load sequencers for Train A and Train B shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit.	1 hour AND Once per 8 hours thereafter
	AND	
	A.2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable.	24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s)
	AND	

(continued)

*For each EDG on Unit 2, the Completion Time that one EDG can be inoperable as specified by Required Action A.1 may be extended beyond the "72 hours and 6 days from failure to meet the LCO" up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore DG to OPERABLE status.	72 hours* AND 6 days* from discovery of failure to meet LCO
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND	
	C.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

*For each EDG on Unit 2, the Completion Time that one EDG can be inoperable as specified by Required Action A.1 may be extended beyond the "72 hours and 6 days from discovery of failure to meet the LCO" up to 288 hours as part of the NSWS system upgrades. System upgrades include maintenance and modification activities associated with the NSWS piping, valves, and branch lines, necessary repairs and/or replacement, and replacement of portions of the NSWS piping to the AFW system. Upon completion of the cleaning, upgrades, and system restoration in refueling outage 1 EOC12, this footnote is no longer applicable.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 189 TO FACILITY OPERATING LICENSE NPF-35

AND AMENDMENT NO. 182 TO FACILITY OPERATING LICENSE NPF-52

DUKE ENERGY CORPORATION, ET AL.

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

By letter dated May 25, 2000, as supplemented by letters dated July 31, August 8, and August 17, 2000, Duke Energy Corporation, et al. (DEC, the licensee), submitted a request for changes to the Catawba Nuclear Station (Catawba), Units 1 and 2, Technical Specifications (TS). The requested changes would temporarily revise TS 3.5.2, "Emergency Core Cooling System" (ECCS); TS 3.6.6, "Containment Spray System" (CSS); TS 3.6.17, "Containment Valve Injection Water System" (CVIWS); TS 3.7.5, "Auxiliary Feedwater System" (AFW); TS 3.7.7, "Component Cooling Water System" (CCW); TS 3.7.8, "Nuclear Service Water System" (NSWS); TS 3.7.10, "Control Room Area Ventilation System" (CRAVS); TS 3.7.12, "Auxiliary Building Filtered Ventilation Exhaust System" (ABFVES); and TS 3.8.1, "AC Sources" (emergency diesel generators (EDGs)).

2.0 BACKGROUND

Periodic testing has indicated that crud and rust accumulation in the NSWS headers and piping is reducing water flow. To restore the water flow and to prevent further deterioration of the headers and the piping, the licensee proposed to clean the system, replace part of the piping, and rearrange certain piping access to the headers to avoid water stagnation. The above TS changes will allow the NSWS Headers "A" and "B" to be taken out of service sequentially to perform the refurbishment, as set forth below.

This work will be performed while Catawba, Unit 1, is in a refueling outage and Catawba, Unit 2, is at power. The cleaning boundary will extend from the discharge of the 1A, 2A, 1B, and 2B pump strainers to the inlet of the safety related heat exchangers, assured sources, and components in the auxiliary building and diesel rooms. Instrumentation lines, branch connections, in-line equipment, and components within the boundary of this project will be inspected, cleaned, and repaired or replaced as required.

During the Unit 1 outage, when the refueling cavity is filled to the 23 ft level above the reactor vessel flange, TS 3.9.4 requires only one residual heat removal loop operable and in operation. During the refurbishment, one NSWS loop will be operable and in operation; therefore, Unit 1

will be in conformance with the above TS (except TS 3.7.10) without revision. The allowed outage time (AOT) extensions discussed below (except TS 3.7.10) apply only to Unit 2, which will still be in power operation. The extension of the AOT for TS 3.7.10 is applicable to both units.

The licensee is performing more frequent surveillance measurements to assure that the flow continues to meet system requirements. The increased surveillance, however, results in system unavailabilities, which increases the risk of operation. The proposed work will eliminate those unavailabilities and, in addition, will decrease the risk from future system deterioration. The licensee used probabilistic risk analysis to quantify the risk increase during the 12 days proposed for the refurbishment for each NSWS loop. The licensee indicated that the risk increase during the 12 days of the work is not significant, and on a yearly (average) basis the risk will be lower due to the improvements made by this work. The staff has examined the systems aspects of the proposed operations and evaluated the risk information provided by the licensee to determine the acceptability of the proposed changes.

3.0 EVALUATION

3.1 Evaluation of Systems Operation

3.1.1 TS 3.7.8 Nuclear Service Water System

The NSWS provides heat removal for safety related components during a design basis accident (DBA), normal operation, and plant shutdown. In addition, the NSWS provides heat removal for non-safety-related equipment during normal operation.

The NSWS consists of two independent loops (A and B), each of which is shared between the two units. Each loop contains two NSWS pumps, each of which can be powered from the separate emergency diesel generator (EDG) and can supply either unit through common discharge piping. The NSWS provides a safety-related source of water to the AFW system and cooling water to the EDG.

During the refurbishing period, the operable NSWS loop will respond "as designed" to DBAs. Maintenance activities that could impact the NSWS will be curtailed to protect its operability during the refurbishment period. Considering the the low probability of a DBA during the extended AOT, the requested extension from 3 to 12 days is acceptable.

3.1.2 TS 3.5.2 Emergency Core Cooling System

The charging, the safety injection, and the residual heat removal systems each contain redundant 100 percent capacity trains. Either of the two trains is capable of supplying all of the required flow for accident mitigation. In addition, the ability to interconnect the two trains provides the flexibility of providing 100 percent of the required flow from either loop. The licensee indicated that the calculations show that the CCW train in service can support required loads during cross train alignment.

In this configuration the one available NSWS loop and associated train are able to respond to design basis events. The operable loop and train will be protected to the extent practical during this extended period of operation. Considering the low probability of a DBA during the extended AOT, the requested extension from 3 to 12 days is acceptable.

3.1.3 TS 3.6.6 Containment Spray System

The CSS provides containment atmosphere cooling to limit post accident pressure and temperature rise to within design limits. There are two separate equal-capacity trains each capable of meeting the requirements for post accident cooling. During the injection phase of the operation, CSS takes suction from the refueling water storage tank (RWST). In the recirculation phase, it takes suction from the sump. In this case, the water is cooled through a heat exchanger, which is supplied with cooling water from the NSWS. This water will not be available to the affected train during the refurbishment period of 12 days.

The requested 12 days for completing the required action is reasonable considering the redundant capabilities and the low probability of a large break loss-of-coolant accident (LOCA) or a steamline break during the additional 9 days. In addition, recirculation cooling is not required immediately upon the initiation of a design basis accident. Depending on the size of the break, initiation of the recirculation phase may not be required for hours or even days. In the meantime, an independent water supply could be established. Therefore, the requested extension of the AOT from 3 to 12 days is acceptable.

3.1.4 TS 3.6.17 Containment Valve Injection Water System

The CVIWS is designed to prevent containment leakage through the seating surfaces of the double-disc gate valves used for containment isolation. During a LOCA, the valve injection water pressure is higher than the containment peak design pressure. The system consists of two independent redundant trains powered by two independent power supplies. Each train includes a surge chamber, which is filled with water and pressurized with nitrogen. The chamber supplies a main header, which splits into several headers. Each of the headers supplies valve injection water to a set of local containment isolation valves. Makeup water is provided from the demineralized water storage tank during normal plant operation. An assured source of water is provided from the NSWS header if the water level in the surge header drops below the low-low level. The NSWS header from the loop being refurbished will not be available during the extended outage period. The initial period of supply from the surge tank will be unaffected, and the water supply from the NSWS loop in service will be unaffected. Considering the low probability of a DBA during the extended period of the AOT, the requested extension from 7 to 12 days is acceptable.

3.1.5 TS 3.7.5 Auxiliary Feedwater System

The AFW includes three trains, two with motor driven pumps and one with a turbine driven pump, capable of feeding all steam generators through various valving alignments. The AFW system is considered operable when the components and flow paths required to provide redundant flow are operable. The turbine driven AFW pump is supplied water by both loops of NSWS; therefore, the loss of one loop of NSWS renders only one train of motor driven AFW inoperable. The operable NSWS loop provides water to the other motor driven pump and the turbine driven pump. The preferred source of water supply for normal operation is from the

condenser hotwell or the Upper Surge Tanks, which are not safety grade. Additional water is available from the standby nuclear service water pond. In addition, another source of water is available to the turbine driven AFW pump from the piping in the Condenser Circulating Water System as part of the operation of the system known as the Standby Shutdown System. This system provides an alternate means to achieve and maintain a hot shutdown condition following postulated fire and sabotage events.

Unless there is a transient and the condensate quality water supply becomes unavailable, the NSWS will not be required. In case of an accident the operable trains will be able to respond fully to the AFW supply needs. The available NSWS train will be protected to the extent practical during the refurbishing period. Considering the low probability of a DBA during the extended period of the AOT, the requested extension from 7 to 12 days is acceptable.

3.1.6 TS 3.7.7 Component Cooling Water System

The CCW system provides a heat sink for the process and operating heat from safety related components during a DBA or a transient. During normal operation, the CCW provides a heat sink for various non-essential components and acts as a barrier (for the potential release of radioactive byproducts) between potentially radioactive systems and the environment. The CCW system is configured as two independent, full capacity loops, each of which includes two 50 percent capacity pumps. Each train is powered from a separate bus. In the event of a DBA, only one train is needed to supply the flow assumed in the safety analysis. Therefore, only the redundancy of the CCW is affected by the extension of the required action from 3 to 12 days. In addition, the licensee is planning to use plant procedures to cross tie selected CCW loads while the affected CCW heat exchanger is out of service. Considering the low probability of a DBA during the extended period of the AOT, the requested extension from 3 to 12 days is acceptable.

3.1.7 TS 3.7.10 Control Room Area Ventilation System

The CRAVS protects the control room environment in case of an uncontrolled release of radioactivity or noxious gases. The control room is shared by the two units; therefore, the CRAVS is also shared. There are two independent redundant trains which consist of a prefilter (to remove moisture droplets), a high efficiency particulate air (HEPA) filter (to remove radioactive and non radioactive particulates), an activated charcoal adsorber section (to remove gaseous activity, mainly iodine), a second bank of HEPA filters, and a fan. The CRAVS must be operable when either unit is operating. The CRAVS are powered from normal and emergency power. If normal or emergency power to the CRAVS becomes unavailable, the required LCO action must be entered. During the NSWS refurbishment, one emergency power train will be inoperable due to the lack of cooling water to the associated EDGs, but normal power will be available to both trains. Considering the low probability of a DBA during the extended period of the AOT, the requested extension from 7 to 12 days is acceptable.

3.1.8 TS 3.7.12 Auxiliary Building Filtered Ventilation Exhaust System

The ABFVES normally filters air exhausted from potentially contaminated areas of the auxiliary building, which includes the ECCS pump rooms and provides ventilation to other areas. The ABFVES consists of two independent trains, each of which includes: a prefilter/demister, a HEPA filter, an activated charcoal adsorber, a downstream HEPA, and a fan. When an

actuation signal is received, the ECCS pump room atmosphere is channeled through the ABFVES. Both trains are powered from normal and emergency power sources that are shared by both units. If normal or emergency power to the ABFVES becomes unavailable, the required LCO action must be entered. During the NSWS refurbishment, one emergency power train will be inoperable due to the lack of cooling water to the associated EDGs, but normal power will be available to both trains. Considering the low probability of a DBA during the extended period of the AOT, the requested extension from 7 to 12 days is acceptable.

3.1.9 TS 3.8.1 Emergency Diesel Generators

The EDGs provide essential auxiliary power to supply the class 1E loads required to safely shut down the plant following a DBA. The EDGs are required to assume certain loads upon detection of bus undervoltage and also supply the blackout switchgear. Diesel cooling water is supplied by the NSWS. During the NSWS refurbishment, cooling water will not be available to one of the EDGs. Although, the affected EDG will be inoperable, the licensee stated that it will be functional because it will be supplied with an alternate non-safety related water supply. Considering the low probability of a DBA during the extended period of the AOT, and the fact that all units will be functional, the requested extension from 3 to 12 days is acceptable.

3.1.10 Contingencies

The extensions to an AOT of 12 days discussed for the various systems above will be used twice. One NSWS loop will be refurbished during each of the two 12-day periods. During these periods the licensee stated that there will be no major testing or maintenance planned on the NSWS or the affected systems. The licensee also stated that the affected EDG will be provided with a non-safety related water supply and will be functional even though it will be declared inoperable due to unavailability of its NSWS cooling.

In addition, the licensee stated that the following measures will be implemented to enhance the safety of the operation during the two 12-day periods:

1. No major maintenance or testing will be planned on offsite power sources.

2. Training will be provided to the personnel involved with the operation.

3. No major maintenance or testing will be planned on the standby shutdown facility.

4. No major testing or maintenance will be planned on the operable trains of the ECCS, CSS, CVIWS, AFW, CCW, CRAVS, ABFVES and EDGs.

5. The operable trains remaining in service will be considered protected trains with increased monitoring to assure their operability.

6. Plant procedures will be used to cross tie selected CCW loads while the affected CCW heat exchanger is out of service.

7. The condenser circulating system on Catawba, Unit 1 (shutdown unit) will be drained and isolated (the turbine building flood event is one of the dominant contributors to the CDF). For Catawba, Unit 2, the condenser circulating system will be inservice and no major

maintenance or testing will be planned in order to minimize any potential challenges to this system.

8. An individual will be stationed in the SSF continuously. This individual is trained on how to operate the SSF diesel generator and the standby makeup pump to establish an alternate method of reactor coolant pump seal injection. This will provide additional assurance that the SSF will be available.

3.1.11 Summary and Conclusion for System Operations

The licensee requested a temporary extension for the AOT for systems affected by the upgrading and refurbishing of the NSWS. The actual extension is either from 3 or 7 to 12 days for Catawba, Unit 2, while Catawba, Unit 1, is in a refueling outage. The operation will affect the availability of the redundant systems. The plant will be able to respond to a DBA if the available trains respond as designed. The licensee will enhance this capability by treating the affected trains as protected systems, and implementing other compensatory measures as discussed in Section 3.1.10. Considering the low probability of a DBA during the extended period of the AOT, the requested extension from 3 or 7 to 12 days is acceptable.

3.2 Evaluation of Risk Assessment

In evaluating the risk information submitted by the licensee, the three-tiered approach documented in RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," was followed. The first tier of the three-tiered approach includes the assessment of the risk impact of the proposed change for comparison to acceptance guidelines consistent with the Commission's Safety Goal Policy Statement, as documented in Regulatory Guide (RG) 1.174 entitled "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." In addition, the first tier aims at ensuring that the plant risk does not increase unacceptably during the period the equipment is taken out of service. The second tier addresses the need to preclude potentially high risk configurations that could result if equipment in addition to that associated with the change is taken out of service simultaneously. The third tier addresses the establishment of an overall configuration risk management program (CRMP) for identifying risk significant configurations resulting from maintenance or other operational activities and taking appropriate compensatory measures to avoid such configurations.

3.2.1 Quality of Risk Assessment

The licensee used its PRA model to assess the risk associated with taking a loop of NSWS out of service for up to 12 days (nine days beyond its current TS limit of 3 days). The risk assessment has taken some credit for the compensatory actions that are to be implemented during the proposed NSWS outage. For example, it was assumed that there will be no planned outage of several risk-significant pieces of equipment, such as the redundant trains of the safety-related systems, during the NSWS outage. In addition, the licensee used its PRA to identify dominant contributing sequences to the estimated increase in risk as well as major contributing failures and human errors. Insights from the risk assessment were used in identifying appropriate monitoring and compensatory measures. The licensee submitted dominant sequences and cutsets contributing over 90% to the estimated increase in risk. The staff evaluated the quality of this information by comparing it to applicable findings from the

staff's review of the PRA (developed as part of licensee's individual plant evaluation (IPE)) as well as to findings for similar plants and found it acceptable.

3.2.2 Risk Impact of the Proposed Change (Tier 1)

An acceptable approach to risk-informed decision making is to show that the proposed change to the licensing basis meets several key principles (RG 1.174). One of these principles is to show that the proposed change results in an increase in risk, in terms of core damage frequency (CDF) and large early release frequency (LERF), which is small and consistent with the Commission's Safety Goal Policy Statement. Acceptance guidelines for meeting this principle are presented in RG 1.174. Although RG 1.174 refers to permanent changes to the licensing basis and the licensee proposes a temporary change to allow a one-time AOT extension for each NSWS train, guidance provided in RG 1.174 can be used to show that the proposed change would result in an increase in risk which is small and consistent with the Commission's Safety Goal Policy Statement.

The licensee used its PRA model of the plant to calculate the following risk increases due to the proposed temporary change:

- The mean CDF will increase by about 9E-6/year during the one-year period beginning with implementation of the NSWS train outage extensions to perform refurbishment.

- The mean annual CDF will increase by about 1.8E-6/year when the change in CDF associated with the outage extensions is considered in the framework of an average over a five-year period.

- The net mean annual CDF will actually decrease during the one-year period after implementation of the NSWS train outage extensions to perform refurbishment.

- The mean LERF will increase by less than 1E-7/year during the one-year period beginning with implementation of the NSWS train outage extensions to perform refurbishment.

According to the guidelines of RG 1.174, the estimated increases in the mean values of CDF and LERF are of low risk significance.

In addition to changes in the mean values of CDF and LERF, the incremental conditional core damage probability (ICCDP) and the incremental conditional large early release probability (ICLERP) were assessed. These quantities are a measure of the increase in probability of core damage and large early release, respectively, during a single outage assumed to last for the entire duration allowed by the proposed change.

The ICCDP was estimated to be 4.5E-6 and ICLERP was estimated to be less than 5E-8. These values were compared with the acceptance guidance criteria of 5E-7 for ICCDP and 5E-8 for ICLERP, respectively, outlined in RG 1.177. This comparison shows that the value of ICCDP is somewhat higher than 5E-7 while the value of ICLERP indicates a small risk impact. However, the value of ICCDP would most likely be significantly smaller if the effects of the numerous non-quantified monitoring and compensatory measures (e.g., during the 12-day periods the operable trains will be considered protected trains and all routine monitoring will be

increased) had been considered. For the above reasons and the fact that the proposed TS change is temporary, the plant risk will not increase unacceptably.

3.2.3 Avoidance of High Risk Plant Configurations (Tier 2)

The licensee used its PRA to identify dominant contributing sequences and associated cutsets to the estimated increase in risk as well as major contributing failures and human errors. Insights from the risk assessment were used in identifying the monitoring and compensatory measures (listed in Section 3.1.10) to avoid high risk plant configurations during an NSWS train outage. The staff finds that the proposed precautions, as well as their proposed implementation, are adequate for preventing the identified high risk plant configurations.

3.2.4 Risk-Informed Configuration Risk Management (Tier 3)

The intent of the risk-informed configuration risk management is to ensure that plant safety is maintained and monitored during an extended outage. A formal commitment to maintain a CRMP is required on the part of a utility prior to implementation of a risk-informed TS whenever such TS is entered and risk-significant components are taken out of service. The licensee stated that the operable trains remaining in service will be considered protected trains with increased monitoring and no testing or maintenance performed on them to the extent practical. Also, no major testing or maintenance will be planned on offsite power sources or on the standby shutdown facility.

3.2.5 Conclusion for Risk Evaluation

The staff concludes that the results and insights of the risk analysis supports the proposed temporary AOT extensions from 3 or 7 to12 days.

4.0 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.

5.0 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 (65 FR 51860). 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.

6.0 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.

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