

July 30, 2008

Mr. J. R. Morris
Site Vice President
Catawba Nuclear Station
Duke Energy Carolinas, LLC
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2, ISSUANCE OF AMENDMENTS REGARDING SINGLE SUPPLY HEADER OPERATION OF THE BURIED NUCLEAR SERVICE WATER SYSTEM (TAC NOS. MD6275 AND MD6276)

Dear Mr. Morris:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 243 to Renewed Facility Operating License NPF-35 and Amendment No. 237 to Renewed Facility Operating License NPF-52 for the Catawba Nuclear Station, Units 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated July 30, 2007, as supplemented May 27, 2008 and June 23, 2008.

The amendments revise the Technical Specifications (TSs) to allow single supply header operation of the buried nuclear service water (RN) system piping for up to 30 days only during pre-planned maintenance of the buried RN system piping.

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,

/RA/

John Stang, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-413 and 50-414

Enclosures:

1. Amendment No. 243 to NPF-35
2. Amendment No. 237 to NPF-52
3. Safety Evaluation

cc w/encls: See next page

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Package No.: ML081980768
Amendment No.: ML081980769
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OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	OGC "NLO**"	NRR/SBPB/BC	NRR/ITSB/BC *	NRR/LPL2-1/BC
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DATE	07/3/08	07/21/08	07/24/08	06 / 20 /08	07/29/08	07/28/08

OFFICIAL RECORD COPY **with comments

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DUKE ENERGY CAROLINAS, LLC
NORTH CAROLINA ELECTRIC MEMBERSHIP CORPORATION
SALUDA RIVER ELECTRIC COOPERATIVE, INC.
DOCKET NO. 50-413
CATAWBA NUCLEAR STATION, UNIT 1
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 243
Renewed 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) Renewed Facility Operating License No. NPF-35 filed by the Duke Energy Carolinas, LLC, acting for itself, North Carolina Electric Membership Corporation and Saluda River Electric Cooperative, Inc. (licensees), dated July 30, 2007, as supplemented May 27, 2008, and June 23, 2008, 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 Renewed 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. 243, which are attached hereto, are hereby incorporated into this license. Duke Energy Carolinas, LLC 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 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Melanie C. Wong, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-35
and the Technical Specifications

Date of Issuance: July 30, 2008

DUKE ENERGY CAROLINAS, LLC
NORTH CAROLINA MUNICIPAL POWER AGENCY NO. 1
PIEDMONT MUNICIPAL POWER AGENCY
DOCKET NO. 50-414
CATAWBA NUCLEAR STATION, UNIT 2
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 237
Renewed 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) Renewed Facility Operating License No. NPF-52 filed by the Duke Energy Carolinas, LLC, acting for itself, North Carolina Municipal Power Agency No. 1 and Piedmont Municipal Power Agency (licensees), dated July 30, 2007, as supplemented May 27, 2008, and June 23, 2008, 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 Renewed 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. 237, which are attached hereto, are hereby incorporated into this license. Duke Energy Carolinas, LLC 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 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Melanie C. Wong, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-52
and the Technical Specifications

Date of Issuance: July 30, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 243
RENEWED FACILITY OPERATING LICENSE NO. NPF-35
DOCKET NO. 50-413
AND LICENSE AMENDMENT NO. 237
RENEWED FACILITY OPERATING LICENSE NO. NPF-52
DOCKET NO. 50-414

Replace the following pages of the Renewed Facility Operating Licenses and the Appendix A Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

License Pages
NPF-35 page 4
NPF-52 page 4

TSs

3.7.8-1
3.7.8-2
3.7.8-3

Insert

License Pages
NPF-35 page 4
NPF-52 page 4

TSs

3.7.8-1
3.7.8-2
3.7.8-3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 243 TO RENEWED FACILITY OPERATING LICENSE NPF-35

AND

AMENDMENT NO. 237 TO RENEWED FACILITY OPERATING LICENSE NPF-52

DUKE ENERGY CAROLINAS, LLC

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

By application dated July 30, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072640193), as supplemented by letters dated May 27, 2008 (ADAMS Accession No. ML081510801), and June 23, 2008 (ADAMS Accession No. ML081770060), Duke Energy Carolinas, LLC (Duke, the licensee), requested changes to the Technical Specifications (TSs) for the Catawba Nuclear Station, Units 1 and 2 (Catawba 1 and 2). The supplements, dated May 27, 2008, and June 23, 2008, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published the *Federal Register* on February 26, 2008 (73 FR 10296).

The proposed changes would revise the Technical Specifications (TSs) Section 3.7.8 to allow single supply header operation of the nuclear service water (RN) system for up to 30 days only during pre-planned maintenance of the RN system buried supply header piping.

2.0 BACKGROUND

Since initial plant operation of Catawba 1 and 2, a limited number of small leaks have occurred in the RN system buried supply header piping. None of the leaks discovered by the licensee would have prevented the RN system from performing its intended function. The licensee has been aggressive in repairing and maintaining the RN system piping. In addition, the RN system piping has not shown any signs of wall thinning.

Currently TS 3.7.8 has a limiting condition for operation (LCO) which allows any active or passive component in the RN system including the buried RN piping supply headers to be out of service for up to 72 hours. This limits the licensee's ability to make repairs and perform

maintenance on the buried RN supply headers. Because of the 72-hour restriction in the LCO, the licensee has previously requested several one-time changes to the TS to extend the LCO completion time to allow repair and maintenance of the buried RN system supply headers. The NRC approved these requests and articulated its findings in safety evaluations dated January 7, 2003 (Amendment Nos. 203 and 196) (ADAMS Accession No. ML030070375), and November 17, 2005 (Amendment Nos. 228 and 223) (ADAMS Accession No. ML053250121). In these safety evaluations, the NRC staff found the TS changes were justified to temporarily extend additional completion time beyond the existing TS requirements to allow refurbishment and repair of the RN system supply headers.

In a public meeting between the NRC staff and the licensee on January 31, 2005, the licensee made a presentation on the proposed RN system modifications, and the need for further one-time extensions of TS 3.7.8 allowed completion times. The NRC staff discussed with the licensee the potential for a permanent change to the TS specification to allow single RN header operation during pre-planned maintenance of the buried RN system supply header piping to eliminate the need for future multiple TS changes. During the meeting the licensee verbally committed to propose such a change to the TS. This commitment is documented in the meeting summary dated February 16, 2005 (ADAMS Accession No. ML050490187).

3.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.36 requires all operating nuclear reactors to include TS for the subject plant. The LCOs along with required completion times are specified for each system included in the TS. The NRC staff performed its review on the deterministic justifications that support the TS change in accordance with the guidance provided in, "NUREG 0800 Review of Safety Analysis Reports for Nuclear Power Plants," Standard Review Plan (SRP), Section 9.2.1, "Station Service Water System."

The NRC staff also used the requirements of 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 4, 5, and 44, pertaining to (1) the ability of the system to provide heat transfer loads from safety-related systems, (2) component redundancy for safety function performance assuming a single active component failure coincident, and (3) the capability to isolate components, subsystems, or piping to ensure the system safety function will not be compromised, as guidance during the review of the proposed TS change.

4.0 TECHNICAL EVALUATION

As discussed above, this safety evaluation pertains to the considerations that are referred to in SRP Section 9.2.1 and 10 CFR Part 50, Appendix A, GDC 4, 5, and 44.

4.1 Ability of System To Provide Heat Transfer Loads and Ensure Safety Function During Accident Conditions

The Catawba 1 and 2 Updated Final Safety Analysis Report (UFSAR) states that the RN system provides essential support functions to the engineered safety features of Catawba 1 and 2. The system is designed to provide a safety-related source of cooling water to the auxiliary feedwater system, the emergency diesel generators (EDGs), and various heat loads in both the safety and non-safety portions of each unit. The RN system has 2 independent headers (A and B), that are shared between the two units. Each header contains two RN pumps that can be powered from

the unit's specific separate EDG. A shared header can supply cooling water to either unit through the common discharge piping. Each shared loop is split at the loop's supply header to provide redundant trains of cooling water to either unit's essential/non-essential components and EDGs.

As discussed above, the NRC staff approved two of the licensee's one-time TS change requests to allow extended TS completion time of the RN system to allow the licensee to refurbish and repair the RN system header piping and make other system enhancements. Those amendments are similar in nature to the current proposed TS. The licensee is making enhancements to the RN system to permanently install crossover piping and control valves in the associated unit's EDGs and essential/non-essential components that receive RN cooling water through either system's related train A or B during a design-basis event. The modifications were intended to provide cooling to either unit's specific EDGs and essential components during plant single RN system header operation, while maintaining the redundant cooling capability to both units. During this operation, the RN system would be aligned to direct all flow through the crossover piping and manual control valves to the in-service supply header in the RN pump-house. The flow would then direct cooling water supply to each unit's EDGs and essential/non-essential components trains A and B through the associated crossover piping and manual control valves in the diesel generator and auxiliary buildings.

The proposed change to TS 3.7.8 is applicable during normal operating conditions (modes 1, 2, 3, and 4) in which both loop headers and all RN pumps are available to provide cooling water to the unit's related EDGs and essential components. The proposed TS change would allow an extension of the allowed completion time of the TS LCO 3.7.8 from 72 hours in single header configuration to up to 30 days for only pre-planned maintenance of the buried RN supply headers. All other active and passive components will still be restricted to the 72-hour completion time in the LCO. If a design-basis event (e.g., a loss-of-coolant accident (LOCA) coincident with a loss of offsite power (LOOP), and with a loss of RN pit level) occurs during this operating configuration, it would result in a loss of one of the shared loop RN pumps in the pump-house. However, the unaffected RN pumps would continue to provide cooling water through the installed crossover piping and by manually open valves between the shared loops to both units. When the RN system is in the single header configuration, all active components of the RN system (i.e. pumps, electric supply normal and emergency, valves, strainers and instrumentation) continue to meet the requirements of GDC 44, for single failure requirements. The proposed 30-day allowed completion time for the RN system single header operation is applicable only to the buried underground supply header piping. The single header operation is only for pre-planned maintenance.

The licensee has been aggressive in repairing and maintaining the RN piping. During previous extended single supply header operation for repairs of the RN supply headers, inspections of the RN piping have not discovered any flaws which would lead to a catastrophic failure of the RN piping. In addition, the RN piping has not shown any signs of wall thinning or degradation. Single supply header operation requires the evaluation of the response of the RN system to pipe rupture events. The requirements for evaluation of such events are elaborated in Sections 3.6.1 and 3.6.2 of the SRP. The RN system is considered to be a moderate energy system and subject to the requirements for postulating breaks of moderate energy piping. The SRP specifies the required through-wall leak size to postulate. In addition, locations are specified at which moderate energy leaks should be postulated. The Catawba 1 and 2 licensing basis for pipe rupture complies with the SRP and is contained in the licensee's UFSAR.

Postulated pipe ruptures on moderate energy piping are evaluated with the plant initially in normal operation. A subsequent failure of an active component is assumed which may hinder the mitigation of the leak. Pipe ruptures are considered the initiating events and concurrent design-basis events are not required to be considered (unless they result from the pipe rupture).

Single supply header operation affects the pipe rupture analysis similar to the way it affects design-basis event single passive failures. For postulated pipe ruptures on the in-service supply header piping, the leakage will have to be tolerated on a long-term basis (i.e., safe shutdown of both units from 100-percent power). Leakage rates from postulated pipe ruptures are governed by the pressure in the pipe and the assumed crack size. The crack size is related to the diameter and wall thickness of the piping. The postulated leak rates for the RN piping applicable to single header configuration are:

30-inch piping in the pump-house	2400 gallons per minute (gpm)
42-inch piping in the auxiliary building	1898 gallons per minute (gpm)

From the standpoint of flow adequacy, the licensee has demonstrated that the RN system can provide adequate flow on a long-term basis to shut down the units concurrent with the above pipe ruptures and an active failure (such as the loss of one RN pump). As indicated above since initial plant operation, the licensee has discovered limited leakage from the RN supply headers but no findings of leakage in the amounts indicated above. Further, the licensee has had no finding of flaws in the RN piping which may lead to pipe rupture greater than the limits listed above.

When the RN system is in single header operation in a highly unlikely event that the single RN header has a catastrophic failure resulting in the loss of all RN, the licensee has a procedure AP/0/A/5500/020, "Loss of Nuclear Service Water," to safely shutdown the units. This procedure would be utilized in the event of the loss of all RN, irregardless of whether the units are in single RN header operation or in dual header operation. The procedure directs operators to maintain reactor coolant pump seal injection using the standby shutdown facility make-up pump so as to preclude a reactor coolant pump seal LOCA. In addition, the procedure instructs operators to use both the fire water system and the drinking water system as an alternative supply of water to safely shutdown both units.

The July 30, 2007, application requested a 35-day completion time for the RN single supply header being out of service for maintenance and repair. The NRC staff raised concerns with the 35-day completion time for single header operation. By letter dated June 23, 2008, the licensee revised TS 3.7.8 and its bases to a 30-day completion time to better reflect experiences in performing the similar 42-inch size piping work and assessing and managing the increase in risk that may result from maintenance activities. The licensee intended that single supply header operation is only permitted during normal operating conditions where all RN pumps and diesel generators are available and clarified that a 30-day LCO basis applied only to pre-planned maintenance activities associated with major work on portion of the buried class III pipe lines between the RN pump-house and auxiliary and diesel buildings. The licensee also discussed detailed work activities that constitute a 30-day LCO basis for approximately 2,500 feet of 42-inch RN supply header piping that include (1) draining and hydrolazing and removing internal corrosion; (2) inspecting and performing required weld repairs; (3) grit blasting the pipe to bare metal and removing the grit and cleaning the pipe; (4) applying safety-related and curing coating;

(5) inspecting coating film thickness and performing coating repair, if necessary; (6) restoring and reburying the header; and (6) placing the RN header back in service.

Based on its review, the NRC staff considers the proposed 30-day LCO basis to complete pre-planned maintenance activities acceptable because the licensee appropriately defined pre-planned activities to include only major work associated with the RN header and the buried portions of Class III piping. Further, the licensee will maintain the availability of all RN pumps, EDGs, and the installed crossover piping and associated manually open valves in the RN pump-house and auxiliary and diesel generator buildings, which will maintain the supply of water to cool redundant trains of essential components and EDGs in both units during single supply header operation. Finally, the licensee will assess and manage the increase in risk that may result from maintenance activities consistent the staff's guidance in RG 1.182.

4.2 Identification and Mitigation of Flood Sources

Regarding leaks detecting, isolating, monitoring, and mitigating capabilities during single supply header operation, the licensee indicated that where un-isolable locations are identified (between the auxiliary building outside wall and the first isolation valves in the RN and between the diesel generator building outside walls and the first isolation valves in the RN system), manual isolation valves were added close to the auxiliary building wall and diesel generator walls to minimize the impact of un-isolable leaks. Piping supports were also installed to alleviate the potential impact of moderate energy pipe breaks. The piping supports are designed to minimize the predicted stress level and included in Catawba 1 and 2 augmented in-service-inspection program to ensure the integrity of the support's structure. The credible leak rate in these areas is limited to the maximum credible external passive failure leakage rate of 50 gpm (i.e., valve packing leakage). With this continuous leakage, the RN system pumps can still provide adequate flow to all essential components. Associated rooms' sump pumps have adequate capacity to mitigate the potential flooding in these areas. Mitigating actions for any leaks would include isolating and performing American Society of Mechanical Engineers' (ASME) Code repairs without removing the piping from service.

The ability to detect leaks in buried RN system piping is dependent on location, depth, surrounding backfill, and size of the leaks. Detected leaks in underground piping are identified when the leak makes its way to the surface. The leaks can be repaired without isolating or removing the buried supply piping from service by excavating the piping, plugging the leaks, and welding ASME Class III pipe cap over the leaks. The ability to detect leaks in above-ground RN system piping in the pump-house and auxiliary and diesel generator buildings can be effectively performed since the piping is accessible and is within visual contact by personnel during plant periodic walkdowns by operators. Mitigating actions for any leaks would also include isolating and performing ASME Code repairs without removing the piping from service.

Based on its review, the NRC staff finds the licensee's approach acceptable because the added isolation valves would minimize the potential impact of loss of cooling water from un-isolable breaks; piping supports would minimize the potential impact of moderate energy pipe breaks; and detection and mitigation using ASME Code repairs and visual inspections would sustain the availability of NSWs to provide cooling without having to remove the system from service, thereby, ensuring water to cool essential components and EDGs.

5.0 SUMMARY

Based on the above review of the licensee's application and supplements, the NRC staff finds that the proposed changes to TS 3.7.8 to add Condition B (30-day LCO) and required surveillance requirements is acceptable. The NRC staff's acceptance is based on the following:

1. The 30-day allowed completion time applies only to the buried RN piping supply headers during pre-planned maintenance and repair activities. All other active and passive RN system components will be restricted to the current TS LCO completion time of 72 hours.
2. The licensee will assess and manage the increase in risk that may result from maintenance activities on the buried RN supply headers during the 30-day allowed completion time consistent the NRC staff's guidance in RG 1.182.
3. Operating experience at Catawba 1 and 2 has shown that RN piping has developed leakage that has been detected and corrected. The leakage detected in the RN supply header piping to date has been well below the leak rate which would prevent the RN system in single header configuration from performing its intended function.
4. If in the event of a highly unlikely catastrophic failure of the RN supply header when in single RN header operation, the licensee has procedures to safely shutdown both units from 100-percent power.
5. The NRC staff finds the protection from internal flooding consistent with the existing licensing basis and current NRC staff's position on reasonable assurance that essential equipment would be protected from credible internal flooding sources.

6.0 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.

7.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of facility components 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 (73 FR 10296). 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.

8.0 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: D. Diec

Date: July 30, 2008