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

July 8, 2019

Ms. Cheryl A. Gayheart
Regulatory Affairs Director
Southern Nuclear Operating Co., Inc.
3535 Colonnade Parkway
Birmingham, AL 35243

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS REGARDING LICENSE AMENDMENT REQUEST TO CORRECT NON-CONSERVATIVE TECHNICAL SPECIFICATION ALLOWABLE VALUES FOR THE CONDENSATE STORAGE TANK LOW LEVEL TRANSFER FUNCTION (EPID L-2018-LLA-0186)

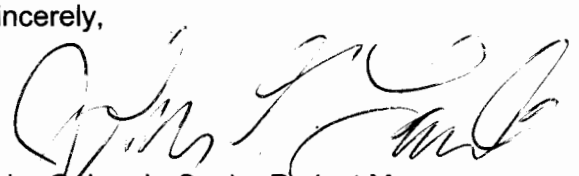
Dear Ms. Gayheart:

The Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 297 to Renewed Facility Operating License No. DPR-57 and Amendment No. 242 to Renewed Facility Operating License No. NPF-5 for the Edwin I. Hatch Nuclear Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated June 29, 2018, and supplemented by letter dated June 12, 2019.

The amendments increase the Allowable Values (AV) specified in TS Table 3.3.5.1-1 for automatic transfer of the High Pressure Coolant Injection pump suction alignment from the condensate storage tank (CST) to the suppression pool for Units 1 and 2. The amendments also increase the AV specified in TS Table 3.3.5.3-1 for automatic transfer of the Reactor Core Isolation Cooling pump suction alignment from the CST to the suppression pool for Unit 1.

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,



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

Docket Nos. 50-321 and 50-366

Enclosures:
1. Amendment No. 297 to DPR-57
2. Amendment No. 242 to NPF-5
3. Safety Evaluation

cc: Listserv

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

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

DOCKET NO. 50-321

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 297
Renewed License No. DPR-57

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Edwin I. Hatch Nuclear Plant, Unit No. 1 (the facility) Renewed Facility Operating License No. DPR-57 filed by Southern Nuclear Operating Company, Inc. (the licensee), acting for itself, Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the owners), dated June 29, 2018, as supplemented by letter dated June 12, 2019, 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. DPR-57 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications (Appendix A) and the Environmental Protection Plan (Appendix B), as revised through Amendment No. 297, are hereby incorporated in the renewed license. Southern Nuclear 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 and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. DPR-57
and Technical Specifications

Date of Issuance: July 8, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 297

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-57

DOCKET NO. 50-321

Replace the following pages of the License 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 Pages	Insert Pages
License	License
4	4
TSs	TSs
3.3-41	3.3-41
3.3-50	3.3-50

for sample analysis or instrumentation calibration, or associated with radioactive apparatus or components;

(6) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

(C) This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I; Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Section 50.54 of Part 50, and Section 70.32 of Part 70; all applicable provisions of the Act and the rules, regulations, and orders of the Commission now or hereafter in effect; and the additional conditions specified or incorporated below:

(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at steady sate reactor core power levels not in excess of 2804 megawatts thermal.

(2) Technical Specifications

The Technical Specifications (Appendix A) and the Environmental Plan (Appendix B), as revised through Amendment No. 297 are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

The Surveillance Requirement (SR) contained in the Technical Specifications and listed below, is not required to be performed immediately upon implementation of Amendment No. 195. The SR listed below shall be successfully demonstrated before the time and condition specified:

SR 3.8.1.18 shall be successfully demonstrated at its next regularly scheduled performance.

(3) Fire Protection

Southern Nuclear shall implement and maintain in effect all provisions of the fire protection program, which is referenced in the Updated Final Safety Analysis Report for the facility, as contained in the updated Fire Hazards Analysis and Fire Protection Program for the Edwin I. Hatch Nuclear Plant, Units 1 and 2, which was originally submitted by letter dated July 22, 1986. Southern Nuclear may make changes to the fire protection program without prior Commission approval only if the changes

Table 3.3.5.1-1 (page 3 of 5)
Emergency Core Cooling System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. High Pressure Coolant Injection (HPCI) System					
a. Reactor Vessel Water Level - Low Low, Level 2	1, 2(c), 3(c)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -47 inches
b. Drywell Pressure - High	1, 2(c), 3(c)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 1.92 psig
c. Reactor Vessel Water Level - High, Level 8	1, 2(c), 3(c)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 56.5 inches
d. Condensate Storage Tank Level - Low	1, 2(c), 3(c)	2	D	SR 3.3.5.1.3 SR 3.3.5.1.5	≥ 3.52 ft
e. Suppression Pool Water Level - High	1, 2(c), 3(c)	2	D	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 154 inches
f. High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2(c), 3(c)	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 605 gpm and ≤ 865 gpm

(continued)

(c) With reactor steam dome pressure > 150 psig.

Table 3.3.5.3-1 (page 1 of 1)
Reactor Core Isolation Cooling System Instrumentation

FUNCTION	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Reactor Vessel Water Level - Low Low, Level 2	4	B	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.4 SR 3.3.5.3.5	≥ -47 inches
2. Reactor Vessel Water Level - High, Level 8	2	C	SR 3.3.5.3.1 SR 3.3.5.3.2 SR 3.3.5.3.4 SR 3.3.5.3.5	≤ 56.5 inches
3. Condensate Storage Tank Level - Low	2	D	SR 3.3.5.3.3 SR 3.3.5.3.5	≥ 1.0 ft
4. Suppression Pool Water Level - High	2	D	SR 3.3.5.3.3 SR 3.3.5.3.5	≤ 151 inches

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

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

DOCKET NO. 50-366

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 242
Renewed License No. NPF-5

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the Edwin I. Hatch Nuclear Plant, Unit No. 2 (the facility) Renewed Facility Operating License No. NPF-5 filed by Southern Nuclear Operating Company, Inc. (the licensee), acting for itself, Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the owners), dated June 29, 2018, as supplemented by letter dated June 12, 2019, 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-5 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications (Appendix A) and the Environmental Protection Plan (Appendix B), as revised through Amendment No. 242 are hereby incorporated in the renewed license. Southern Nuclear 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 and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to Renewed Facility
Operating License No. NPF-5
and Technical Specifications

Date of Issuance: July 8, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 242

EDWIN I. HATCH NUCLEAR PLANT, UNIT NO. 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-5

DOCKET NO. 50-366

Replace the following pages of the License 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 Pages	Insert Pages
License	License
4	4
TSs	TSs
3.3-41	3.3-41

(6) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

(C) This renewed license shall be deemed to contain, and is subject to, the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Section 50.54 of Part 50, and Section 70.32 of Part 70; all applicable provisions of the Act and the rules, regulations, and orders of the Commission now or hereafter in effect; and the additional conditions[2] specified or incorporated below:

(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at steady sate reactor core power levels not in excess of 2,804 megawatts thermal, in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications (Appendix A) and the Environmental Protection Plan (Appendix B); as revised through Amendment No. 242 are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Additional Conditions

The matters specified in the following conditions shall be completed to the satisfaction of the Commission within the stated time periods following the issuance of the renewed license or within the operational restrictions indicated. The removal of these conditions shall be made by an amendment to the license supported by a favorable evaluation by the Commission.

(a) Fire Protection

Southern Nuclear shall implement and maintain in effect all provisions of the fire protection program, which is referenced in the Updated Final Safety Analysis Report for the facility, as contained

---

[2] The original licensee authorized to possess, use, and operate the facility with Georgia Power Company (GPC). Consequently, certain historical references to GPC remain in certain license conditions.

Table 3.3.5.1-1 (page 3 of 5)
Emergency Core Cooling System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER FUNCTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3.	High Pressure Coolant Injection (HPCI) System					
a.	Reactor Vessel Water Level - Low Low, Level 2	1, 2(c), 3(c)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ -47 inches
b.	Drywell Pressure - High	1, 2(c), 3(c)	4	B	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 1.92 psig
c.	Reactor Vessel Water Level - High, Level 8	1, 2(c), 3(c)	2	C	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 56.5 inches
d.	Condensate Storage Tank Level - Low	1, 2(c), 3(c)	2	D	SR 3.3.5.1.3 SR 3.3.5.1.5	≥ 3.25 ft
e.	Suppression Pool Water Level - High	1, 2(c), 3(c)	2	D	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≤ 154 inches
f.	High Pressure Coolant Injection Pump Discharge Flow - Low (Bypass)	1, 2(c), 3(c)	1	E	SR 3.3.5.1.1 SR 3.3.5.1.2 SR 3.3.5.1.4 SR 3.3.5.1.5	≥ 590 gpm and ≤ 845 gpm

(continued)

(c) With reactor steam dome pressure > 150 psig.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 297 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-57

AND

AMENDMENT NO. 242 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-5

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-321 AND 50-366

1.0 INTRODUCTION

By application dated June 29, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18180A396), as supplemented by letter dated June 12, 2019 (ADAMS Accession No. ML19163A180), Southern Nuclear Operating Company, Inc. (SNC, the licensee), requested changes to the Technical Specifications (TSs) for the Edwin I. Hatch Nuclear Plant, Unit Nos. 1 and 2 (Hatch, Units 1 and 2).

The proposed change increases the Allowable Values (AVs) specified in TS Table 3.3.5.1-1 for automatic transfer of the High Pressure Coolant Injection (HPCI) pump suction alignment from the condensate storage tank (CST) to the suppression pool for Units 1 and 2. The proposed change also increases the AV specified in TS Table 3.3.5.3-1 for automatic transfer of the Reactor Core Isolation Cooling (RCIC) pump suction alignment from the CST to the suppression pool for Unit 1.

By letter dated May 31, 2018 (ADAMS Accession No. ML18123A368), the NRC issued Amendment Nos. 290 and 235, to Hatch Units 1 and 2, respectively. These amendments replaced the existing requirements in several TSs related to operations with a potential for draining the reactor vessel with revised TSs providing alternative requirements in new TS 3.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control," and associated changes. Amendment No. 290 re-numbered TS 3.3.5.2, "RCIC System Instrumentation," to TS 3.5.3.3. In addition, Amendment No. 290 re-numbered Table 3.3.5.2-1, "Reactor Core Isolation Cooling System Instrumentation," to Table 3.3.5.3-1, and re-numbered TS Page 3.3-47 to 3.3-50.

The supplement dated June 12, 2019, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 4, 2018 (83 FR 62622).

2.0 REGULATORY EVALUATION

The following NRC requirements were evaluated for their applicability to the proposed changes.

The regulation 10 CFR 50.36, "Technical specifications," Criterion 3, requires that a TS limiting condition for operation be established for:

> A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The regulation 10 CFR 50.36, Criterion 4 requires that a TS limiting condition for operation be established for:

> A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

There are no regulatory requirements associated with use of the CST as the non-safety related suction source for HPCI or RCIC. The design basis, safety related source of water for these systems is the suppression pool. The proposed change ensures the automatic transfer from the CST to the suppression pool occurs without adversely impacting HPCI or RCIC system availability or operation.

HNP, Unit 1, was not licensed to the 10 CFR 50, Appendix A, General Design Criteria (GDC) for Nuclear Power Plants. HNP, Unit 1 was licensed to 1967 GDC equivalents published in the *Federal Register* published on July 11, 1967 (32 FR 10213) (ADAMS Accession No. ML043310029). HNP, Unit 2, was licensed under the 10 CFR 50, Appendix A GDC.

Hatch Unit 1 Equivalent: 1967 GDC Criterion 37- Engineered Safety Features Basis for Design

> Engineered safety feature shall be provided in the facility to back up the safety provided by the core design, the reactor coolant pressure boundary, and their protection systems. As a minimum such engineered safety features shall be designed to cope with any size reactor coolant pressure boundary break up to and including the circumferential rupture of any pipe in that boundary assuming unobstructed discharge from both ends.

Hatch Unit 1 Equivalent: 1967 GDC Criterion 44 - Emergency Core Cooling System Capability

> At least two emergency core cooling systems, preferably of different design principles, each with a capability for accomplishing abundant emergency core cooling, shall be provided. Each emergency core cooling system and the core shall be designed to prevent fuel and clad damage that would interfere with the emergency core cooling function and to limit the clad metal-water reaction to negligible amounts for all sizes of breaks in the reactor coolant pressure boundary, including the double-ended rupture of the largest pipe. The performance of each emergency core cooling system shall be evaluated conservatively in each area of uncertainty. The systems shall not share active components and shall not share other features or components unless it can be demonstrated that (a) the capability of the shared feature or component to perform its required function can be readily ascertained during reactor operation, (b) failure of the shared feature or component does not initiate a loss-of-coolant accident, and (c) capability of the shared feature or component to perform its required function Is not impaired by the effects of a loss-of-coolant accident and is not lost during the entire period this function Is required following tan accident.

Hatch Unit 2 was licensed under the current 10 CFR Part 50 Appendix A GDCs. The following GDC is applicable to Unit 2:

Criterion 33 - Reactor coolant makeup.

> A system to supply reactor coolant makeup for protection against small breaks in the reactor coolant pressure boundary shall be provided. The system safety function shall be to assure that specified acceptable fuel design limits are not exceeded as a result of reactor coolant loss due to leakage from the reactor coolant pressure boundary and rupture of small piping or other small components which are part of the boundary. The system shall be designed to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished using the piping, pumps, and valves used to maintain coolant inventory during normal reactor operation.

The NRC Regulatory Guide (RG) 1.105, "Setpoints for Safety-Related Instrumentation," (ADAMS Accession No. ML993560062), describes a method acceptable to the NRC staff for complying with these regulations for ensuring that setpoints for safety-related instrumentation are initially within and remain within the technical specification limits.

The NRC Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," (ADAMS Accession No. ML051810077) provides additional guidance.

3.0 TECHNICAL EVALUATION

3.1 System Design and Operation

The Emergency Core Cooling Systems (ECCS) consists of the following subsystems: (1) HPCI, (2) Automatic depressurization system, (3) Core spray, and (4) Low-pressure coolant injection (LPCI), an operating mode of the residual heat removal (RHR) system.

The HPCI system ensures the reactor is adequately cooled to limit fuel-cladding temperature in the event of a small break in the reactor coolant system (RCS) and a loss-of-coolant that does not result in rapid depressurization of the reactor pressure vessel (RPV).

The RCIC system provides core cooling during reactor shutdown by pumping makeup water into the RPV in case of a loss of flow from the main feed system and is activated in time to preclude conditions which lead to inadequate core cooling.

The letter dated June 29, 2018, stated:

> Upon receipt of an initiation signal, the HPCI pump automatically starts and injects water, taken from either the CST or suppression pool, into the Reactor Coolant System (RCS). Although the suppression pool provides the credited source of water for the HPCI system, the system is normally aligned to take suction from the CST.
>
> The RCIC system is not part of the ECCS. Upon receipt of an initiation signal, the RCIC pump automatically starts and injects water, taken from either the CST or suppression pool, into the RCS. The system is normally aligned to take suction from the CST.
>
> Low water level in the CST introduces the possibility of air entrainment in the HPCI and RCIC pump suctions. To prevent this, if the water level in the CST falls below a pre-selected level, both valves on the HPCI suction line from the suppression pool automatically open, and then the valve on the HPCI suction line from the CST automatically closes. Similarly, if the water level in the CST falls below a pre-selected level for the RCIC pump, both valves on the RCIC suction line from the suppression pool automatically open, and then the valve on the RCIC suction line from the CST automatically closes. These automatic suction transfers ensure that an adequate supply of makeup water is available to the HPCI and RCIC pumps. For both the HPCI and RCIC pumps, the pump suction valves are interlocked so that both suppression pool suction valves must be open before the CST suction valve automatically closes in order to prevent losing pump suction.

Further details of the system design and operation can be found on pages E-2 and E-3 on the letter dated June 29, 2018.

3.2 Current TS Requirements

The AVs for the CST Level - Low ECCS instrumentation function associated with automatic transfer of the HPCI pump suction alignment from the CST to the suppression pool are provided as Function 3.d in TS Table 3.3.5.1-1. The current Unit 1 and Unit 2 AVs are 2.58 feet, and 2.61 feet, respectively.

The AV for the CST Level- Low ECCS instrumentation function associated with automatic transfer of the RCIC pump suction alignment from the CST to the suppression pool is provided as Function 3 of TS Table 3.3.5.3-1. The current Unit 1 AV is 0.87 feet. No change to the Unit 2 AV for the CST Level - Low is necessary or requested.

3.3 Reason for Proposed Change

By letter dated May 4, 2009 (ADAMS Accession No. ML091240249), SNC submitted Licensee Event Report (LER) 2009-001 concerning the pump suction swap for HPCI and RCIC being non-conservative with respect to TS requirements. LER 2009-001 stated:

> ...on March 9, 2009, a determination was made that a level switch for the High Pressure Coolant Injection (HPIC) and a level switch for the Reactor Core Isolation Cooling (RCIC) suction swap from the Condensate Storage Tank (CST) to the suppression pool has an actual setpoint that was less conservative than that specified in the Technical Specifications.

During review and evaluation of instrument level switch setpoints, SNC determined that the there was an increase in the assumed switchover time, and this additional time required the CST low level setpoint for suction swap to the torus to be higher to minimize vortexing at the suction from the CST.

Further details regarding the reason for the change can be found on page E-4 of the letter dated June 29, 2018.

This license amendment request (LAR) is required to correct a non-conservative TS. Currently, plant operations are administratively controlled as described in NRC Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety" available at https://www.nrc.gov/reading-rm/doc-collections/gen-comm/admin-letters/1998/al98010.html. In accordance with the guidance in AL 98-10, this LAR is required to resolve non-conservative TSs.

3.4 Description of Proposed Change

In the letter dated June 29, 2018, the proposed changes are stated:

> The proposed change revises the AVs in TS Table 3.3.5.1-1 (Function 3.d) for the HPCI automatic pump suction transfer from the CST to the suppression pool.
>
> - For Hatch Unit 1, the proposed change increases the AV from greater than or equal to 2.58 feet above the bottom of the CST, to greater than or equal to 3.52 feet above the bottom of the CST.
>
> - For Hatch Unit 2, the proposed change increases the AV from greater than or equal to 2.61 feet above the bottom of the CST, to greater than or equal to 3.25 feet above the bottom of the CST.
>
> The proposed change revises the AV in TS Table 3.3.5.3-1 (Function 3) for the RCIC automatic
> pump suction transfer from the CST to the suppression pool.
>
> - For Hatch Unit 1, the proposed change increases the AV from greater than or equal to 0.87 feet above the bottom of the CST, to greater than or equal to 1.0 feet above the bottom of the CST.
>
> - No change is proposed to the Hatch Unit 2 AV.

3.5 NRC Staff Evaluation of Limiting Safety System Settings (LSSS)

The licensee revised the LSSS to address the vortexing phenomena in the CST during water transfer, which necessitates changing the low-level process parameter level for automatic transfer of the HPCI and RCIC pumps, suction alignment from the CST to the suppression pool for Hatch, Units 1 and 2.

In response to the NRC request for additional information (RAI), SNC provided a summary of the Hatch setpoint methodology and a summary of the calculation associated with the HPCI and RCIC systems CST low level transfer instrument functions.

The NRC staff evaluated and independently confirmed that the setpoint methodology and calculation for LSSS is sufficient in accordance with regulations and guidance in 10 CFR 50.36, RG1.105, and RIS 2006-17. In summary, there are two areas that need to be considered in determining whether the LSSSs are in accordance with 10 CFR 50.36. The NRC staff evaluated the appropriate determination of the proposed AVs and nominal trip setpoints. The NRC staff also evaluated how the as-found values are handled during calibration (i.e., how as-left tolerance (ALT), and as-found tolerance (AFT) are determined and used).

The NRC staff evaluated and independently confirmed that the licensee adequately determined the AVs in proposed TS Tables 3.3.5.1-1 and 3.3.5.3-1 by identifying the appropriate uncertainties (i.e., Channel accuracy with trip environment conditions (AT), Calibration error (C), Channel drift (D), Process measurement accuracy (PMA), Primary element accuracy (PEA), Environmental allowances (EA)) in the process value determination and combining them in the manner endorsed by RG 1.105 (i.e., square root sum of the squares (SRSS) of these independent terms, plus biases). The NRC staff determined that the AV was appropriately offset from the analytical limit so that the tolerance limit meets the 95/95 criteria in RG 1.105.

The terms used in the Hatch setpoint methodology are different than those used in the RIS 2006-17; the licensee explained in the RAI response how the Hatch setpoint methodology term "leave alone tolerance (LAT)" has effectively the same meaning as the term "as-left tolerance (ALT)" used in the NRC endorsed guidance. In addition, in the Hatch setpoint surveillance methodology, the AFT is the same as the ALT. The licensee stated:

> The HNP [Hatch] trending program requires that any time a setpoint value is found outside the ALT, an additional evaluation be performed to ensure that the instrument's performance is still enveloped by the assumptions in the drift or setpoint analysis. The trending program also plots setpoint or transmitter as-found /as-left values to verify that the performance of the instruments is within expected boundaries and that adverse trends (i.e., repeated directional changes in as-found /as-left data of smaller magnitudes) are detected and evaluated.

This licensee stated that this practice provides comparable assurance (that instrument degradation is identified) as the NRC endorsed practices for as-found tolerances. The licensee stated that during calibration, if a setpoint was found to deviate from expectations, the associated equipment would be evaluated to ensure the equipment is operating consistent with the assumptions in the setpoint calculation methodology.

The NRC staff evaluated the proposed values in proposed TS Tables 3.3.5.1-1 and 3.3.5.3-1 and verified that:

(1) The appropriate uncertainty terms were identified,
(2) The uncertainty terms were combined using an acceptable methodology to calculate the AV, nominal trip setpoint (NTSP), and ALT, and
(3) The AV and ALT will be used to initiate an investigation to ensure the equipment continues to perform in accordance with the assumptions in the setpoint calculation methodology.

Therefore, NRC staff determined that there is reasonable assurance the equipment settings will be sufficient to transfer suction from the CST to avoid vortexing in accordance with 10 CFR 50.36 and applicable guidance in RIS 2006-17 and RG 1.105.

Based on: (1) the identification of the appropriate uncertainty terms, (2) combining these terms in a manner consistent with RG 1.105, to calculate AVs, NTSP, ALT, and AFT, and (3) performing surveillances and evaluations consistent with RIS 2006-17, the NRC staff concludes this change is safe and complies with 10 CFR 50.36(c)(1)(ii)(A).

3.6 NRC Staff Technical Evaluation

The analytical limits (ALs), based on which the proposed AVs were determined, were calculated using a more rigorous hydraulic modeling testing, and consideration of HPCI and RCIC suction valve stroke times under design basis conditions was also taken into account. The methodology which was used to determine the ALs for HPCI and RCIC pump suctions is described in the Farley supplemental letter dated June 16, 2014 (ADAMS Accession No. ML14167A493). Specifically, it was developed based on air intrusion test data obtained from scale model simulations at the D.C. Cook Refueling Water Storage Tank (RWST). The purpose of the tests was to compare and evaluate air intrusion data obtained from physical testing of tank suction piping configurations with critical submergence values predicted using models developed by Harleman, D. R. (1959), "Selective Withdrawal from a Vertically Stratified Fluid," Proceedings, Eighth Congress of the International Association for Hydraulics Research, pp 10-C-1 to 10-C-16 (ADAMS Accession No. ML14167A493).

The NRC staff found the Harleman correlation acceptable in the letter dated August 15, 2014 (ADAMS Accession No. ML14155A302), regarding Amendment No.195 to Renewed Facility Operating License No. NPF-2 and Amendment No.191 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (Farley), respectively. The Farley Amendment No. 195 and 191 revised the CST level requirement specified in TS SR 3.7.6.1; specifically, the minimum required CST water inventory was increased from 150,000 gallons to 164,000 gallons.

The D.C Cook simulation was modeled using a horizontal suction pipe with a vertical opening, located just above the tank floor, and with no vortex suppression devices. D.C. Cook RWST was used as a scaled model for Hatch CST because its piping configuration is geometrically similar and representative of HPCI and RCIC suction lines; and therefore, the NRC staff finds that the D.C. Cook RWST test data is applicable to Hatch CST.

The Harleman correlation was used to determine the critical submergence ALs for the Hatch Unit 1 and 2 HPCI and RCIC CST suction line automatic transfer functions. These ALs were then used as an input to the calculations that were performed to determine the proposed AVs in the Hatch TS, and their associated instrument setpoints. For Hatch, the Harleman correlation for a horizontal suction line with a vertical opening was used for CST to represent the specific piping configuration at Hatch. The Harleman correlation has been demonstrated to provide a conservative basis for determining the minimum submergence for pump suction lines necessary to prevent air intrusion. The NRC staff has noted that the Harleman correlation was previously used by SNC, and was approved by the NRC staff in a similar licensing action, dated August 15, 2014 (ADAMS Accession ML14155A302) for Farley Nuclear Plant. In the NRC staff safety evaluation, it was concluded that SNC used a vortex correlation developed by Harleman, which is shown to be conservative in predicting critical submergence when compared to applicable test data at the Froude number that corresponds to the maximum flow rate from the CST.

The NRC staff reviewed the following information from the letter dated June 29, 2018:

> The D.C Cook simulation was modeled using a horizontal suction pipe with a vertical opening, located just above the tank floor, and with no vortex suppression devices. This configuration is similar to the configuration of the HPCI and RCIC suction lines from the CSTs for HNP Unit 1 and 2.
>
> The D.C. Cook tests were performed in both transient (open loop) and steady-state (closed loop) modes in which the water level in a tank was decreased at a given flow rate until air intrusion into the horizontal suction pipe was observed. The test results were documented in terms of: 1) when a steady stream of air bubbles was first detected in the downcomer of the suction piping, and 2) when the gas void fraction was estimated to be 2% [percent] of the downcomer cross-sectional flow area. As shown on Figure 3 of Calculation Note FAI/09-19, there is very little difference between the onset of air intrusion (gray triangular data points) and the conditions that resulted in an estimated void fraction of 2% [percent] (red and gray square data points). The D.C. Cook test method, configuration, and dimensions are described and shown in Section 2.0 and Figure 2 of Calculation Note FAI/09-19.
>
> Air entrainment data from the D.C. Cook testing is represented on Figure 3 of Calculation Note FAI/09-19 in terms of the dimensionless water submergence (S/D) as a function of the Froude number, where S is the height of water above the bottom of the suction pipe, and D is the suction pipe diameter. The dimensionless Froude number is defined as $U/[g\ D]^{0.5}$, where U is the one-dimensional superficial velocity, g

is the acceleration of gravity, and D is the pipe internal diameter. The figure also provides a comparison of the air entrainment data from the D.C. Cook testing with the critical submergence values predicted by the Harleman and Lubin-Springer methods. The experimental observations from the D.C. Cook testing demonstrate that both methods provide conservative prediction of the onset of air intrusion in tank suction piping.

The calculation of ALs, proposed AVs, and instrument setpoints for the automatic HPCI and RCIC pump suction transfer was performed based on the Harleman correlation. The LAR identified the following additional hydraulic model assumptions:

HPCI Assumptions

- Full rated HPCI and RCIC flow from the CST was assumed for the duration of the HPCI suction transfer and was not reduced based on valve throttling during transition,
- RCIC and HPCI pumps are both assumed to be operating at full flow for the duration of transfer,
- CST and suppression pool motor operated valve stroke times are based on reduced, post-accident voltage, and
- Transfer time is based on the sum of the calculated longest suppression pool suction valve stroke time and CST suction valve stroke time.

RCIC Assumptions

- Full rated RCIC flow from the CST was assumed for the duration of the RCIC suction transfer and was not reduced based on valve throttling during transition,
- No HPCI flow from the CST was assumed during the RCIC suction transfer since the HPCI suction transfer will have completed prior to initiation of the RCIC suction transfer, and
- CST and suppression pool valve stroke times are based on reduced, post-accident voltage. Transfer time is based on the sum of the calculated longest suppression pool suction valve stroke time and CST suction valve stroke time.

The LAR also indicated that the HPCI and RCIC suction valve stroke times were developed using the boiling water reactor owners group direct current motor method, which predicts the stroke time under design basis conditions. The method accounts for effects such as degraded voltage and elevated temperature by using an incremental approach to evaluate the valve stroke. The stroke time is determined by summing the times for all the stroke increments.

The NRC staff reviewed the LAR and related documentations, including the plant TS, TS Bases, and FSAR. The NRC staff concludes that the ALs for the critical submergence levels for HPCI and RCIC pump suction lines in Hatch CST, calculated using the Harleman correlation, are acceptable based on the following considerations: (1) the piping configurations, geometry and conditions at pump suction lines of D.C. Cook RWST, where the scaled model tests were performed, are similar to that of HPCI and RCIC pump suction lines at Hatch CST; therefore, the D.C. Cook RWST test data is applicable to Hatch CST, (2) the Harleman correlation which was used to calculate the ALs at Hatch CST is expected to provide conservative results because it conservatively bounds D.C. Cook test data for critical submergence characterizing

the onset of significant air entrainment, and (3) the proposed AVs are higher than the current values in Hatch TS, and therefore, more conservative.

Based on the above, the NRC staff concludes that the methodology used to calculate the ALs (from which AVs were derived) for the minimum submergence necessary to prevent air intrusion into HPCI and RCIC pump suction lines in Hatch CST is acceptable. The NRC staff found that the applicable regulatory requirements will continue to be met, adequate defense-in-depth will be maintained, and sufficient safety margins will be maintained. The NRC staff, therefore, finds that the TS changes are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendments on June 25, 2019. The State official had no comments.

5.0 PUBLIC COMMENTS

On December 4, 2018, the NRC published a biweekly notice of this proposed amendment in the *Federal Register* (83 FR 62622) for a 30-day comment period. The comment period ended on January 3, 2019. The NRC received one comment from the public. The following is the comment from Lucas B.:

> Is this just for there to be a bi-weekly notice on Nuclear energy?
>
> Seems good?

The NRC staff understands this comment to be a question about the purpose of the biweekly notice. The Atomic Energy Act of 1954, as amended requires the Commission to publish notice of any amendments issued, or proposed to be issued, and grants the Commission the authority to issue such amendments under certain conditions. The December 4, 2018, biweekly notice gives members of the public notice of all amendments issued, or proposed to be issued, from November 6, 2018, to November 19, 2018, including the proposed amendment discussed in this document. The biweekly notice also sets dates by which members of the public who wish to file comments or request a hearing on those amendments could do so.

6.0 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 on December 4, 2018 (83 FR 62622). 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.

7.0 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) there is reasonable assurance that 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 Contributors: Norbert Carte, NRR/DE/EICB;
Gursharan Singh, NRR/DE/EICB;
Jerome Bettle, NRR/DSS/SCPB
Muhammad Razzaque, NRR/DSS/SRXB
John G. Lamb, NRR/DORL/LPLII-1

Date: July 8, 2019

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS REGARDING LICENSE AMENDMENT REQUEST TO CORRECT NON-CONSERVATIVE TECHNICAL SPECIFICATION ALLOWABLE VALUES FOR THE CONDENSATE STORAGE TANK LOW LEVEL TRANSFER FUNCTION (EPID L-2018-LLA-0186) DATE JULY 8, 2019

DISTRIBUTION:
Public
RidsNrrDssScpb Resource
RidsNrrDorlLpl2-1 Resource
RidsNrrPMHatch Resource (hard copy)
RidsACRS_MailCTR Resource
RidsNrrLAKGoldstein Resource
RidsRgn2Mail Center Resource
RidsNrrDeicb Resource
RidsNrrDssSrxb Resource

Amendment No. ML19177A166 ***via email** ****via memo**

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	DE/EICB/BC	DSS/SCPB/BC
NAME	JLamb	KGoldstein	MWaters*	SAnderson*
DATE	6/26/19	06/27/19	6/24/19	6/25/19
OFFICE	DSS/SRXB/BC(A)	OGC - NLO	NRR/LPL2-1/BC	NRR/LPL2-1/PM
NAME	JBorromeo**	KGamin*	MMarkley	JLamb
DATE	6/24/19	7/5/19	7/8/19	7/8/19

OFFICIAL RECORD COPY