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

August 15, 2014

Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
P. O. Box 1295 / Bin - 038
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2, ISSUANCE OF AMENDMENT REGARDING MINIMUM CONDENSATE STORAGE TANK LEVEL TECHNICAL SPECIFICATION (TAC NOS. ME9293 AND ME9294)

Dear Mr. Pierce:

The Nuclear Regulatory Commission has issued the enclosed 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, respectively. The amendments consists of changes to the Technical Specifications in response to your application dated August 20, 2012, as supplemented by letters dated October 25, 2012, November 8, 2012, July 2, 2013, and June 16, 2014.

The amendments revise the condensate storage tank level requirement specified in Technical Specification surveillance requirement 3.7.6.1. Specifically, the minimum required Condensate Storage Tank water inventory would be increased from 150,000 gallons to 164,000 gallons.

A copy of the related Safety Evaluation is also enclosed. Proprietary information was provided in the licensee's submittal and is included in Staff's evaluation. The proprietary information has been removed for the public version of the Safety Evaluation. The location of the proprietary information is identified by a vertical bar on the left margin and brackets [ ].

A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Shawn Williams

Shawn A. Williams, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-348 and 50-364

Enclosures:
1. Amendment No. 195 to NPF-2
2. Amendment No. 191 to NPF-8
3. Safety Evaluation (Public Version)
4. Safety Evaluation (Non-Public Version)

cc w/encls 1,2, and 3: Distribution via Listserv

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

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

ALABAMA POWER COMPANY

DOCKET NO. 50-348

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 195
Renewed License No. NPF-2

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

   A. The application for amendment to the Joseph M. Farley Nuclear Plant, Unit 1, Renewed Facility Operating Licenses No. NPF-2, filed by Southern Nuclear Operating Company, Inc. (the licensee), dated August 20, 2012, as supplemented by letters dated October 25, 2012, November 8, 2012, July 2, 2013, and June 16, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations 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;

   D. The issuance of this license 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.

Enclosure 1

2. Accordingly, the license is amended by 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-2, is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 195, are hereby incorporated in the renewed facility operating license. Southern Nuclear 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

Eddie Miller FOR RJP

Robert J. Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: August 15, 2014

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

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

ALABAMA POWER COMPANY

DOCKET NO. 50-364

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 191
Renewed License No. NPF-8

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

   A. The application for amendment to the Joseph M. Farley Nuclear Plant, Unit 2, Renewed Facility Operating Licenses No. NPF-8, filed by Southern Nuclear Operating Company, Inc. (the licensee), dated August 20, 2012, as supplemented by letters dated October 25, 2012, November 8, 2012, July 2, 2013, and June 16, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations 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;

   D. The issuance of this license 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.

Enclosure 2

2. Accordingly, the license is amended by 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-8 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 191, are hereby incorporated in the renewed facility operating license. Southern Nuclear 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

David Wrona for RJP

Robert J. Pascarelli, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 15, 2014

ATTACHMENT TO

LICENSE AMENDMENT NO. 195

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-2

DOCKET NO. 50-348

AND LICENSE AMENDMENT NO. 191

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-8

DOCKET NO. 50-364

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

Remove	Insert
Licenses	Licenses
NPF-2, page 4	NPF-2, page 4
NPF-8, page 3	NPF-8, page 3
TSs	TSs
3.7.6-1	3.7.6-1

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 195 are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

(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 renewed license supported by a favorable evaluation by the Commission.

a. Southern Nuclear shall not operate the reactor in Operational Modes 1 and 2 with less than three reactor coolant pumps in operation.

b. Deleted per Amendment 13

c. Deleted per Amendment 2

d. Deleted per Amendment 2

e. Deleted per Amendment 152

Deleted per Amendment 2

f. Deleted per Amendment 158

g. Southern Nuclear shall maintain a secondary water chemistry monitoring program to inhibit steam generator tube degradation. This program shall include:

1) Identification of a sampling schedule for the critical parameters and control points for these parameters;

2) Identification of the procedures used to quantify parameters that are critical to control points;

3) Identification of process sampling points;

4) A procedure for the recording and management of data;

(2) Alabama Power Company, pursuant to Section 103 of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess but not operate the facility at the designated location in Houston County, Alabama in accordance with the procedures and limitations set forth in this renewed license.

(3) Southern Nuclear, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;

(4) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

(5) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess, and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

(6) Southern Nuclear, pursuant to the Act and 10 CFR Parts 30, 40 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 Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

Southern Nuclear is authorized to operate the facility at reactor core power levels not in excess of 2775 megawatts thermal.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 191 are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

3.7 PLANT SYSTEMS

3.7.6 Condensate Storage Tank (CST)

LCO 3.7.6 The CST shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CST inoperable.	A.1 Verify by administrative means OPERABILITY of backup water supply. AND A.2 Restore CST to OPERABLE status.	4 hours AND Once per 12 hours thereafter 7 days
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

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify the CST level is ≥ 164,000 gal.	In accordance with the Surveillance Frequency Control Program

UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 195 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-2

AND

AMENDMENT NO. 191 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-8

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-348 AND 50-364

1.0 INTRODUCTION

By letter dated August 20, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12234A743), Southern Nuclear Operating Company (SNC, the licensee) submitted a request for changes to Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2, Technical Specifications (TSs). Subsequently, SNC submitted supplemental letters dated October 25, 2012 (ADAMS Accession No. ML12300A279), November 8, 2012, (ADAMS Accession No. ML12319A150), July 2, 2013 (ADAMS Accession No. ML13198A441), and June 16, 2014 (ADAMS Accession No. ML14167A493). The supplemental letters provided additional information in support of the TS changes and do not change the scope of the original TS changes.

The requested changes would revise the condensate storage tank (CST) water inventory specified in TS Surveillance Requirement (SR) 3.7.6.1. Specifically, the minimum required CST water inventory would be increased from 150,000 gallons to 164,000 gallons. The proposed changes were made to address the Nuclear Regulatory Commission (NRC) Component Design Bases Inspection (CDBI) Report 05000348/2011010 and 05000364/2011010, (CDBI Report) dated December 19, 2011 (ADAMS Accession No. ML113530575). The NRC staff concerns are related to the calculation basis for the CST water volume with respect to non-conservative assumptions regarding heat loads and potential vortexing.

2.0 REGULATORY EVALUATION

The CST provides makeup and surge capacity to compensate for changes in the turbine plant systems water inventory and provides reserve supply water for emergency shutdown decay heat removal, should the normal feedwater system fail.

The following regulations and guidance are applicable to this licensee amendment request:

- The NRC's regulatory requirements related to the content of the TSs are set forth in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36, "Technical Specifications." This regulation requires that the TSs include items in five categories. These categories include (1) safety limits, limiting safety system settings, and limiting control setting, (2) Limiting Conditions for Operation (LCOs), (3) Surveillance Requirements (SRs), (4) design features, and (5) administrative controls.

  10 CFR 50.36(c)(3) status that surveillances requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and the limiting conditions for operation will be met.

- General Design Criterion (GDC) 2, "Design bases for protection against natural phenomena," in Appendix A to 10 CFR Part 50 requires SSCs important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes ... without loss of capacity to perform their safety functions.

- NUREG-0800, Section 9.2.5, NRC Branch Technical Position ASB 9-2, July 1981, Revision 2, "Residual Decay Energy for Light-Water Reactors for Long-Term Cooling," (ADAMS Accession No. ML052350549) provides acceptable assumptions and formulations that may be used to calculate the residual decay heat energy release rate for light-water-cooling longer term cooling of the reactor facility.

3.0 TECHNICAL EVALUATION

The FNP, Unit 1 and Unit 2, CSTs have a 500,000 gallon capacity. The CST and all associated piping and components required to supply the Auxiliary Feedwater (AFW) pumps are safety class 2B and seismic category I. Only the lower portion of the CST (corresponding to 164,832 gallons of water) is missile protected. The licensee credited only the missile protected portion of the CST in establishing the required minimum CST level for TS SR 3.7.6.1.of water) is missile protected. The licensee credited only the missile protected portion of the CST in establishing the required minimum CST level for TS SR 3.7.6.1.

This licensee stated their approach satisfied the requirements and plant-specific design bases for GDC 2, which required SSCs important to safety be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capacity to perform their safety functions. The proposed TS SR 3.7.6.1 to increase CST water inventory requirements from 150,000 gallons to 164,000 gallons was within the capacity of 164,832 gallons for the missile-protected portion of the CST.

The October 25, 2012, supplement, Enclosure 2, SNC Calculation BM-95-0961-001, "Verification of CST Sizing Basis", Version 6, includes the licensee's revised calculation to determine the minimum required CST inventory to be maintained by TS SR 3.7.6.1.

The licensee provided that the CST inventory needed for normal cooldown includes the condensate water volume required for:

Decay heat removal for holding the reactor at hot standby for 2 hours (decay ht. 2hrs) +
Decay heat removal for the 4 hour cooldown to 350 F (decay ht. 4hrs) +
Removal of sensible heat in the reactor coolant system (RCS) (sensible ht.) +
Removal of the heat added to the RCS by the reactor coolant pumps (RCP heat) +
Prevention of vortexing at the AFW pump's suction inlet (vortex prevention) +
Inventory loss due to the assumed ruptured lines (inventory loss)

The licensee's calculated values for the total CST inventory required for normal cooldown = 39,575 gallons (decay heat for 2 hrs) + 47,708 gallons (decay heat. 4 hrs) + 29,955 gallons (sensible ht.) + 14,881 gallons (RCP heat) + 10,132 gallons (vortex prevention) +11,803 gallons (inventory loss) = 154,054 gallons.

Based on the calculated required minimum CST volume of 154,054 gallons and the 164,832 gallons capacity of for the missile-protected portion of the CST, the licensee has conservatively proposed TS SR 3.7.6.1 to require a CST minimum volume of 164,000 gallons.

The NRC staff reviewed the licensee's LAR and supplemental information, and provided its evaluation in Section 3.1 for the determination of the CST water inventory required for decay heat, sensible heat, RCP heat, and inventory loss and in Section 3.2 for the CST water inventory required for vortex prevention.

3.1 CST Water Inventory for Decay Heat, Sensible Heat, RCP heat, and Inventory Loss

The licensee submitted a revised calculation to determine the minimum CST water inventory for decay heat removal. The revised calculation is based upon additional assumptions regarding heat loads that were identified as deficient in the CDBI Report. The licensee stated that plant events involving the usage of the CST were reanalyzed with the revised CST volume calculation to identify the most limiting event to arrive at the new CST minimum volume required for decay heat removal.

The NRC staff requested the licensee provide additional information on how the new heat load assumptions were factored into the revised calculation and information regarding all of the events analyzed with the revised calculation to verify the licensee identified the most limiting event. The licensee response is included in the October 25, 2014, supplement.

The NRC staff reviewed the licensee's calculation and analyses to ensure that applicable events were considered; that sufficient analytical methods were used, and the assumptions and plant conditions used as inputs in the calculation were adequate.

3.1.1 Events Analyzed for Determining the CST Water Inventory

The CST provides cooling water to remove decay heat and cool down the units following certain events identified in the updated final safety analysis report (UFSAR) in Chapters 6 and 15. The

licensee evaluated these UFSAR Chapters and the TS Bases for TS 3.7.6, "Condensate Storage Tank (CST)." The licensee identified the following events that could be the limiting events affecting the calculation to determine the minimum CST water inventory required for decay heat removal.

Event 1:	TS Bases - Design (Normal Cooldown)
Event 2:	Loss of Normal Feedwater (LNFW) without Loss of Off-Site Power (LOSP)
Event 3:	TS Bases - Operability
Event 4:	Main Feedwater Line Break (MFLB) with LOSP
Event 5:	LOSP with Seismic event
Event 6:	LOSP
Event 7:	Main Steam Line Break (MSLB) without LOSP
Event 8:	Depressurization Main Steam
Event 9:	LOSP with Tornado Event
Event 10:	Small Break Loss-of-Coolant Accident (SBLOCA)
Event 11:	MSLB with LOSP

Staff Assessment
The NRC staff finds that the events above include the applicable UFSAR Chapter 6 and Chapter 15 events and TS Bases of TS 3.7.6 and conclude that the events are acceptable for analysis in determining the required minimum CST water inventory needed for decay heat removal. For each of the above identified events, the licensee performed a CST water inventory analysis.

3.1.2 CST Water Inventory Analyses

The licensee analyses of the events identified in Section 3.1.1, were provided in supplements dated October 25, 2012, Enclosure 2, SNC Calculation BM-95-0961-001, "Verification of CST Sizing Basis", and in supplement dated July 2, 2013, Enclosure 2, "CD Containing DOEJ-FRSNC419117-M001 Version 2, "CST Volume Requirements per Plant Transient Events."

The licensee applied steady state mass and energy balance equations to determine the required CST water inventory needed to remove the different reactor coolant system heat components including decay, sensible, and reactor coolant pumps heat inputs. The calculation included, for the applicable events, the total water volume lost from assumed ruptured lines of AFW pump recirculation lines, un-isolated flow instrumentation lines, and breaks in main feedwater lines and main steam lines.

The licensee stated that conservative values of plant parameters and assumptions were used in the analyses to maximize the calculated minimum CST water inventory needed for decay heat removal. The values of plant parameters discussed in the October 25, 2012, and the July 2, 2013, supplements, included the required decay heat removal time frames, uprate power level, decay heat model, net reactor coolant pump heat added to the RCS, and operator action times to isolate the faulted Steam Generator (SG). The primary plant parameters and assumptions are discussed in Section 3.1.2.1.

Staff Assessment
The NRC staff finds that the licensee applied the mass and energy equations correctly, and adequately considered the RCS heat components as heat inputs that will contribute to the

required minimum CST water inventory needed for decay heat removal.

3.1.2.1 Plant Parameters and Assumptions

Decay Heat Removal Time Frame Assumptions

The licensee's CST water inventory analyses assumed two models representing the required decay heat removal time frames to calculate the minimum CST water inventory:

1. A duration of 9-hour decay heat removal: The calculated CST water inventory was based on having sufficient water available to maintain the RCS in Mode 3 for 9 hours steaming to the atmosphere. The licensee's analyses of Events 2, 3, 5, 6, 8, and 9 used the 9-hour decay heat removal model.

2. A duration of 6-hour decay heat removal: This model required maintaining the plant in Mode 3 for 2 hours, followed by a cooldown to 350 ^{0}F at a rate of 50 ^{0}F/hour. The analyses of Events 1, 4, 7, 10 and 11 (7-hour decay heat removal due to a higher initial RCS temperature cooled down to 350 ^{0}F) used the 6-hour decay heat removal model.

The licensee's choice of the 9-hour or 6-hour decay time removal model in the analysis for an applicable event was to assure that the resulting CST water volume was maximum and thus, conservative.

Staff Assessment
The NRC staff found that the approach of using 9-hour or 6-hour decay heat removal model for the events indicated above, is consistent with UFSAR Section 9.6.2.3 of Chapter 9.2.6, Condensate Storage Facilities, which stated that: "[t]he Technical Specification basis is to ensure sufficient water is available to maintain the RCS at hot standby for 9 h[ours] with steam discharge to an atmosphere concurrent with a total loss of offsite power. The licensee uses additional conservative assumptions in sizing the CST in conjunction with maintaining the plant at hot standby for 2 h[ours], followed by a 4-h[our] cooldown to 350 ^{0}F."

Decay Heat Load Assumptions

Decay Heat Model
The code, MAP-121 (Version 01), was used to determine the decay heat of the core.

Staff Assessment
Since the model calculating decay heat was based on NUREG-0800, Section 9.2.5, NRC Branch Technical Position ASB 9-2 and was consistent with the analysis of record, it is adequate and acceptable.

Reactor Thermal Power Level
In the December 19, 2011, CDBI Report, the NRC staff identified that in the licensee's calculations of record (BM-95-0961-001, dated March 25, 1999, "Verification of CST Sizing Basis" and CBI-72-4859, "Condensate Storage Tank", Rev. 0) did not take into

consideration +2% calorimetric error in the assumed initial reactor thermal power as discussed in UFSAR Chapter 15 and determined that this assumption was non-conservative, resulting in less required water inventory in the CST.

Staff Assessment
In the licensee's reanalysis, the assumed initial power level was adequately changed to 102% of the uprate thermal power (UTP), as opposed to 100% of the UTP assumed in original calculation. The NRC staff finds that this change addresses the aforementioned issue.

Sensible Heat Input
In the previous calculations of record mentioned above, the sensible heat load was based on the T_{avg} (no load) of 547 ^{0}F. In the December 19, 2011, CDBI Report, the NRC staff identified that the T_{avg} (no load) used was not consistent with UFSAR Chapter 15 analyses that assumed a reactor vessel average temperature of 577 ^{0}F with $\pm$ 6 ^{0}F measurement uncertainty, and determined that the value used was non-conservative.

Staff Assessment
In response to the CDBI Report, the licensee revised the sensible heat load calculations based on the T_{avg} (hot) of 577 ^{0}F + 6 ^{0}F (583 ^{0}F) for plant events where the unit is being shutdown. For plant events where the unit is being held at hot standby, no sensible heat load was added to the CST volume since the unit is not in transition to shutdown and held in hot standby with the intension to return the unit to power. The NRC staff finds that this change addresses the aforementioned issue.

RCP Heat Load
The RCP heat load assumptions were based on two factors. First, if a loss of offsite power was the initiating event or occurred concurrently with another event, no RCP heat was added during the hot standby or cooldown of the unit. In these instances, only 10 MW_t net heat input was added to the RCS due to power operation prior to the event. Secondly, if a loss of offsite power was not the initiating event or did not occur concurrently with the event and the unit is being shutdown, RCP heat for operation of the pump(s) during the cooldown and the net heat added during power operation prior to the event were considered in determining the CST volume.

Staff Assessment
The RCP heat loads assumed in the reanalysis are consistent with the previous analysis of record, and thus adequate and acceptable.

Inventory Loss Calculations Assumptions

Licensee Assessment
For the events occurring concurrently with a postulated credible tornado event (Events 1, 5, and 6) the sizing reanalysis included the CST water inventory loss resulting from the rupture of the AFW pump's minimum flow recirculation lines and the CST's instrumentation lines. The analyses considered water loss from all three recirculation lines and assumed an operator action time of 30 minutes for recirculation line isolation.

Staff Assessment
The assumed operator action time of 30 minutes was adequately supported by the plant procedure, FNP-0-AOP-21.0, "FNP Abnormal Operating Procedure – Severe Weather." This procedure required isolation the affected recirculation lines within 30 minutes in the event of CST missile damage following a tornado or sustained high wind and unexpected CST inventory. The licensee stated that the valves for the recirculation lines can be closed manually inside the plant. Thus, based on the plant procedure and the location of the recirculation lines, the NRC staff concludes the 30-minute operator action time assumption to isolate the AFW recirculation lines is acceptable.

Licensee Assessment
In calculating the water loss from the instrumentation lines, breaks were assumed in all four instrumentation lines for the two AFW pump suction lines at the lowest location above the ground level where the instrumentation lines are exposed to missile impact. The pressure losses in the pump suction pipe and instrument tubing were not credited. It was assumed that the four instrumentation lines will not be isolated during the 6-hour unit cooldown or the 9-hour unit hot standby period.

Staff Assessment
These assumptions are conservative, resulting in a maximum CST inventory loss, and are thus, acceptable.

Licensee Assessment
For events 7 and 11, the reanalysis included the CST inventory loss resulting from a MSLB. The licensee's reanalysis assumed an operator action time of 15 minutes for isolation of the faulted SGs.

Staff Assessment
The 15-minute isolation time assumed in the main steam line break analysis is conservative because it is greater than the isolation time specified in the UFSAR Section 6.5.3 of Chapter 6.5, AFW System, and 15.4.2.1.2.2 of Chapter 15.4.2.1, Ruptured Main Steam Line, which assumed 10 minutes for isolation of the faulted SGs. A greater isolation time results in a larger inventory loss from the CST, thus, the 15-minute assumption is conservative and acceptable.

Licensee Assessment
For event 4, the reanalysis included the CST inventory loss resulting from a MFLB. The licensee's reanalysis assumed an operator action time of 30 minutes for isolation of the faulted SGs.

Staff Assessment
The 30-minute isolation time assumed in the MFLB represented the longest isolation time assumed in UFSAR Section 15.4.2.2.2.2, of Chapter 15.4.2.2, Major Rupture in a Main Feedwater Pipe, which stated that "an analysis has also been performed to demonstrate the operator has at least 30 min[utes] to increase AFW to the intact SGs without hot leg boiling prior to transient turnaround."

The October 25, 2014, submittal, Attachment B, provided the results of the licensee's simulator exercise. It showed that the operator action times to isolate the faulted SGs for both the MSLB

and main feedwater line break events were 6 minutes or less, which is less than the values assumed in the applicable UFSAR section discussed above for the MSLB and MFLB events. The values of the operator action times assumed in the CST sizing reanalysis were conservative, resulting in a larger inventory loss from the CST and increasing the minimum required CST water volume, and are therefore, acceptable.

3.1.2.4 CST Water Inventory Analyses Results (not including vortexing)

The results of the CST water inventory analyses provided in the October 25, 2014, submittal, Enclosure 2, SNC Calculation BM-95-0961-001, "Verification of CST Sizing Basis") showed that that the most limiting event was event 1, TS Bases - Design (Normal Cooldown). Using event 1 in the revised calculation to determine the minimum CST water inventory for decay heat removal, sensible heat, RCP heat, and inventory loss resulted in a required minimum CST water inventory of 143,922 gallons.

3.1.3 Conclusion

As discussed above, the NRC staff reviewed the licensee's revised calculation for the determination of the CST water inventory required for decay heat removal, sensible heat, RCP heat, and inventory loss. The NRC staff concludes that the licensee used acceptable methods, including the decay heat removal time frame models, calometeric method, and inventory loss calculations. The NRC staff concludes the licensee used appropriate plant parameters and assumptions related to the decay heat model, reactor thermal power level, RCP heat load, and higher values of RCS temperature for sensible heat determination. The NRC staff concludes that the licensee calculated minimum CST inventory water inventory for decay heat removal, sensible heat, RCP heat, and inventory loss totaling 143,922 gallons is acceptable.

3.2 Vortex Prevention Analyses

Proprietary information was provided in the licensee's submittal and is included in Staff's safety evaluation in Section 3.2. Proprietary information is identified by a vertical bar on the left margin and brackets [ ]. Removal of the identified proprietary information will make Section 3.2 of this document non-proprietary and publicly available.

3.2.1 Background

Vortexing occurs when water is drawn into a suction line resulting in a depression in the surface of the water often forming a visible whirling vortex. A vortex leading into a pump can cause a gas water mixture exiting the pump resulting in reduced performance.

By letter dated August 20, 2012, SNC submitted a TS license amendment request (LAR) to change TS 3.7.6, "Condensate Storage Tank (CST)," that included an increase in required tank water level based in part on calculated requirements to prevent vortexing. The LAR stated that "The proposed change is being made as a result of a NRC challenge to the current calculation basis with respect to potential vortexing and assumptions regarding heat loads on CST volume." The identified challenge resulted from an NRC inspection as documented in the December 19, 2011, CDBI Report. With respect to vortexing, the inspection conclusion was as follows:

> The team determined that additional inspection and consultation with a vortexing subject matter expert at NRC headquarters would be warranted to evaluate the licensee's application of the methodology used for determining minimum AFW pump submergence. Additionally, the team concluded that additional evaluation of minimum required AFW pump submergence would be necessary to determine if this issue resulted in a more than minor performance deficiency. (URI 05000348, 364/2011010-04, "Evaluation of CST Vortex Effect on AFW Pump Minimum Submergence")

The NRC staff determined that the August 20, 2012, submittal did not provide sufficient information for the NRC staff to accept the license amendment for docketing but provided an opportunity for the licensee to submit supplemental information. The licensee submitted supplemental information on October 25, 2012, and stated that a proprietary document would also be provided. By letter dated November 7, 2012, the NRC staff responded that sufficient information had been provided for the amendment request to be docketed and the review to proceed.

The licensee submitted a proprietary document on November 8, 2012. It stated that the minimum CST submergence level with two pumps drawing from the tank shall be 9.78 inches from the bottom of the tank. With one pump running, the level required shall be 8.36 inches from the bottom of the tank. The licensee justified these conclusions based on a proprietary Fauske report (November 8, 2012, Enclosure 1, Attachment 3, SM-SNC335993-001, Version 2.0, "Vortex Evaluation for Vogtle and Farley *RWSTs and Hatch CSTs," Rev 0, FAI/09-19.* referred to hereafter as (January 16, 2009, Fauske report)) to analyze the potential vortexing, air ingestion, and critical submergence depth. This report, however, did not provide sufficient information for the NRC staff to make a finding. Therefore, the NRC staff requested two proprietary reports[1] that were referenced in the January 16, 2009, Fauske Report that appeared could contain relevant information to FNP for NRC staff to base a finding. In response, SNC proposed making the proprietary reports available for NRC staff review at the Westinghouse offices in Rockville, MD, with the stipulation that the NRC staff could not copy or retain the references. The NRC staff went to the Westinghouse offices on March 24, 2014, to review the two reports requested. The [ ] report was not available for NRC Staff's review because SNC could not obtain permission from the Duke Energy Corporation. However, another document was substituted in its place that included experimental data applicable to the FNP configuration. The NRC staff requested SNC submit a supplement that included the information that NRC staff viewed at the Westinghouse office on March 24, 2014. SNC provided a supplement on June 16, 2014, that includes proprietary and non-proprietary versions of the relevant information that NRC staff viewed at the Westinghouse office.

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[1] [ ]

[ ]

Vortexing and Critical Submergence

With respect to typical nuclear power plant installations, Regulatory Guide 1.82, dated September 2011, states that "the potential for air ingestion resulting from vortex formation ... is a strong function of the Froude number[2]... RG 1.82 also stated that "pump suction inlet hydraulic performance (with respect to air ingestion potential) can be evaluated on the basis of submergence level ... and pump inlet velocity...."[3] Other nondimensional parameters (e.g., the Reynolds number and the Weber number) are of secondary importance." This qualification applies to large dimension configurations, such as typical containment emergency sumps and large tanks such as refueling water storage and condensate tanks. It may not be valid for configurations in which such items as piping or baffles are close to a suction pipe or when performing small-scale or low flow rate testing.

Vortex formation is a function of inlet pipe configuration, velocity, submergence, uniformity of approach flow, sources of flow that may contain air, observation time, and velocity gradients resulting from interactions with walls, floors, and other structures. Correlations that are based on theoretical considerations appear to be accurate only for configurations in which there is complete uniformity of flow with no velocity gradients caused by interactions with walls or perturbations such as created by water flow into a sump. These conditions do not exist in nuclear power plant applications. Consequently, all acceptable methodologies are based on experimental tests of related configurations. Since small perturbations in geometry or operation affect vortexing, the test models must accurately simulate the plant hardware configurations and operation and model sumps, tanks, vortex suppressors, and pipes connected to larger pipes.

In general, test models for predicting critical submergence and vortexing should have the following characteristics included:

- no smaller than one-fourth (1:4) scale;
- Reynolds number greater than 100,000;
- Weber number greater than 720;
- equal Froude number between the model and the plant hardware
- no exit pipes associated with air ingestion caused by vortexing that are smaller than 4 inches in diameter

Conditions where vortexing may occur are typically described in terms of:
S = critical submergence depth, that, for purposes of nuclear applications, is based on an experimentally determined value.

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[2] The Froude number, Fr, is a dimensionless value that describes different flow regimes of open channel flow. The Froude number is a ratio of inertial and gravitational forces.

[3] Submergence depth often is not defined in vortex reports. For horizontal pipes connected to a tank or pump, it is usually defined with respect to the pipe centerline. When addressing pressurized water reactors during mid-loop operation (water level below the upper elevation of a hot leg flow area where the leg connects to the reactor vessel), submergence is often defined with respect to the uppermost elevation of the residual heat removal pipe flow area at the intersection with the hot leg. For plant tests during mid-loop operation, results were reported relative to the hot leg centerline. In addition, some investigators report submergence measured from the bottom of the hot leg horizontal pipe.

S is often provided by a correlation of the form $S/D = f(N_{Fr})$ where
D = exit pipe diameter
S/D is a function of the Froude number.

3.2.2. Discussion

3.2.2.1 FNP Inspection History

The NRC staff participated in a FNP inspection that included assessment of drain-down of the FNP CST. The December 19, 2011, CDBI Report described the CST as:

> a safety related, seismic category I tank that holds up to 500,000 gallons of water and is required by the TS 3.7.6 limiting condition for operation to be maintained at a minimum of 150,000 gallons for use by the AFW system under normal operation and in response to accident conditions. In order to ensure this requirement, the lower 13′ 3-1/8″ of the 46' inside diameter (ID) tank is designed to withstand the effects of tornado missiles. The CST has two 8″ AFW suction pipes – one for the TDAFW pump and one for both MDAFW pumps. Both suction pipes open at 4″ from the tanks' bottom facing down. The suction piping centers are approximately 1′ 3″ apart. The CST has an internal bladder that prevents introduction of air under normal operating conditions.

The inspection team identified an unresolved item regarding the licensee's use of Jain's correlation[4] for evaluation of the required CST water level to prevent vortexing. It also identified that conditions could introduce "air under the CST bladder, allowing a vortex to form, and adversely affect the usable volume of water in the CST."

In response, the licensee's August 20, 2012, submittal and supplements include a new calculation of record for vortexing. The new calculation of record uses the Harleman correlation (Harleman, 1959) rather than the Jain's correlation for the evaluation of the required CST water level to prevent vortexing.

3.2.2.2 Evaluation

In NRC's letter dated September 25, 2012 (ADAMS Accession No. ML12257A098), the NRC staff found the LAR to be unacceptable for docketing with an opportunity to provide supplemental information. The below includes the requests related to vortexing:

<u>NRC Request:</u>
The LAR states that additional consideration regarding vortexing was applied during the revised calculation of the CST minimum volume. However, the LAR did not describe specific considerations that factored into changes made to the referenced revised calculations. Provide additional information to describe how the licensee factored in the vortexing effects as part of the

[4] This calculation utilizes a methodology based on Akalank K. Jain, "Air Entrainment in Radial Flow towards Intakes", ASCE Journal of Hydraulic Division, September 1978, to determine the minimum submergence water level in the tank to prevent vortexing.

revised calculation for the CST volume. Provide additional information to describe how the licensee factored in the vortexing effects as part of the revised calculation for the CST volume.

NRC Request:
The LAR is incomplete and the staff cannot initiate a technical review until, at a minimum, the following is provided:

- Calculation of post-trip water requirements.
- Information that supports an independent evaluation of the level necessary to prevent vortexting.
- Provide the licensee's determination of the level that prevents vortexting.
- Applicable Updated Final Safety Analysis Report sections.

Licensee's Response

The licensee responded by letter dated October 25, 2012. SNC stated that the critical submergence was calculated using [ ] (Harleman, 1959).[5] The Harleman correlation was developed for a vertically downward configuration (referred to in this SE as the Harleman configuration). The Harleman configuration differs from the 45 degree upward flow pipe installed at FNP. The FNP CST Suction Pipe Configuration is provided in Figure 1.

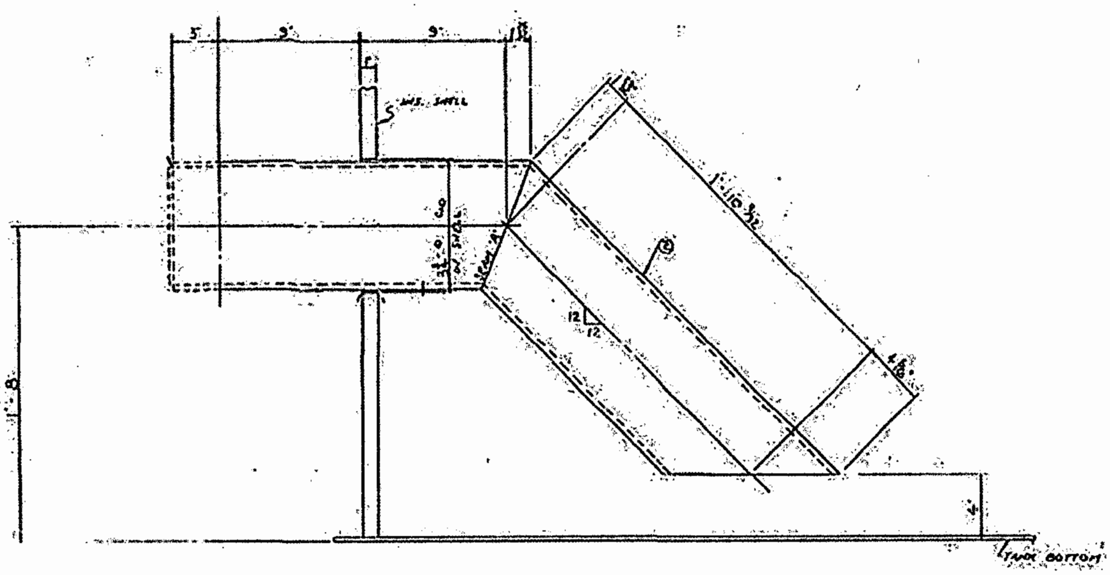

Figure 1 - Farley Condensate Storage Tank Suction Pipe Configuration
(Farley Drawing Number 72-4859)

[5] Different organizations use different correlations that are attributed to Harleman. For example, Duke Energy has used S/D = [ ] (Energy, February 10, 2014) and Alden Research Laboratory has used S/D =[ ]. Comparison of these correlations established that FNP's version is the most conservative.

The Harleman configuration was stated to increase "the submergence level by a factor of two over the submergence level for a 45 degree angle pipe or elbow nozzle facing downward." Using that information, the licensee calculated a critical submergence of 5.78 inches and stated that the minimum allowable submergence was therefore 9.78 inches from the bottom of the tank which includes the four inches of unusable volume below the suction nozzle.

The January 16, 2009, Fauske Report referenced data for configurations at D.C. Cook, McGuire, Catawba, Oconee, and Cooper that were stated to relate to the specific configurations used in Southern Nuclear plants including FNP. The report stated that the specific measurements all provide justification for the manner in which air intrusion should be assessed for the Vogtle, FNP, and Hatch CSTs. The January 16, 2009, Fauske Report described the configurations as follows:

- D. C. Cook: ¼ scale tests
- McGuire, Catawba, Oconee reactor water tanks: ¼ scale tests
- Vogtle: Refueling Water Storage Tank (RWST) suction pipes exit via downward facing elbows or a downward angled pipe. Vogtle is equipped with cage type vortex suppressors.
- FNP: RWST suction pipes exit via downward facing elbows or a downward angled pipe.
- Hatch: CST suction pipes are horizontal in the tank sidewall.

Because of the differences in test configurations and lack of supporting information, the NRC Staff could not make a safety finding regarding vortexing at the FNP using the information on D.C. Cook, McGuire, Catawba, Cooper, Oconee, Hatch, and Vogtle, based on the October 25, 2012, supplement. However, there were references to Alden Research Laboratory (ARL) tests that appeared to be applicable to FNP. NRC staff viewed additional information related to those references on March 24, 2014, at the Westinghouse Office and requested the licensee submit that relevant information to the NRC. The licensee subsequently revised the reports previously submitted to include proprietary and non-proprietary versions of the data viewed at the Westinghouse office in the June 16, 2014, supplement.

An important aspect of the ARL tests is that all were run with draindown conditions to include the transient effect that would be achieved in a plant application. This generally results in a smaller S than would result from steady state or reduced outflow tests. The NRC staff judged this not to be a concern because the reduced outflow would be expected to increase S and therefore is conservative. The NRC staff observes that a negligible small quantity of gas could be ingested for a short period of time.

The Fauske report (Fauske1, January 16, 2009) in the November 8, 2012, supplement, Enclosure 1, Attachment 3, included the Figure 2 configuration that ARL used to obtain test data applicable to Catawba and McGuire. Comparing Figure 1 and Figure 2, both FNP and Catawba have similar CST configurations because the exit pipes end with a 45 degree elbow that is close to the bottom of the tank. Figure 3 shows the McGuire and Catawba scaled tests data (dotted line) to be effectively the same.

Proprietary Information
Not included in
Public Version of Safety Evaluation

Figure 2 - Catawba FWST vortex study tank and suction nozzle setup: elevation

Proprietary Information
Not included in
Public Version of Safety Evaluation

Figure 3 - Limits of Gas Intrusion for a Downward Facing Suction Pipe
June 16, 2014, Enclosure 2, Attachment 3, FAI/09-19-P, Revision 1

The NRC staff generated the critical submergence depth (S/D) illustrated by the solid line in Figure 4 that is an upper bound on the proprietary data provided in Figure 3. The critical submergence depth FNP calculated using the Harleman correlation is provided as the dashed

line for comparison. Since the Froude number corresponding to the maximum flow rate is 0.64, the Harleman correlation and thus the critical submergence depth used by FNP provides a factor of three conservatism. The similarity between the Farley and Catawba/McGuire configurations combined with the factor of three conservatism are the basis for the conclusion that the Harleman correlation is acceptable to use for FNP even though the Harleman configuration slightly differs.

Proprietary Information
Not included in
Public Version of Safety Evaluation

Figure 4 - Comparison of Harleman Correlation to Upper Bound of Figure 3 Data

The NRC staff finds the FNP Harleman equation margin to be sufficient to compensate for any error introduced by using data from tests that were not specific to FNP. Consequently, the NRC staff finds that the Harleman correlation is acceptable for predicting the critical submergence water level during CST draindown at FNP. Therefore, the calculated critical submergence of 5.78 inches that corresponds to the minimum allowable submergence of 9.78 inches from the bottom of the tank is acceptable.

3.2.3.4 Conclusion Regarding the Vortexing Calculation

SNC uses a vortex correlation developed by Harleman (Harleman, 1959) for a vertically downward configuration that differs from the 45 degree upward flow pipe installed at FNP. This correlation is shown to over-predict the critical submergence by a factor of three when compared to applicable test data at the Froude number that corresponds to the maximum flow rate from the CST. Over-predicting the critical submergence by a factor of three provides sufficient margin to justify SNC using the Harleman correlation to calculate the critical submergence of 5.78 inches that corresponds to the minimum allowable submergence of 9.78 inches from the bottom of the FNP CST to prevent vortexing. A FNP CST level of 9.78 inches from the bottom of the tank, is consistent with the 10,132 gallons SNC is using as an input to calculate the minimum volume needed for vortex prevention.

3.3 Conclusion

The NRC staff finds the licensee's calculated volume of the required CST inventory for normal cooldown and potential vortexing of 154,054 gallons acceptable. The licensee has conservatively proposed TS SR 3.7.6.1 to require a CST minimum volume of 164,000 gallons. The NRC staff find that the 164,000 gallons is within the capacity of the 164,832 gallons for the missile-protected portion of the CST, satisfying the GDC 2 requirements that required SSCs important to safety be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capacity to perform their safety functions. Therefore, the NRC staff finds the proposed TS SR 3.7.6.1 to increase the CST water inventory requirements from 150,000 gallons to 164,000 gallons acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Alabama 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. 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 (78 FR 3037, January 15, 2013). 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) 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.

7.0 REFERENCES

Letter from M. Ajluni (SNC) to NRC, "Joseph M. Farley Nuclear Plant – Units 1 and 2 License Amendment Request to Technical Specification 3.7.6, Condensate Storage Tank," dated August 20, 2012 (ADAMS Accession No. ML12234A743).

Letter from M. Ajluni (SNC) to NRC, "Joseph M. Farley Nuclear Plant – Units 1 and 2, Response to Supplemental Information Request Regarding Technical Specifications Condensate Storage Tank Minimum Level, License Amendment Request," dated October 25, 2012 (ADAMS Accession No. ML12300A279).

- Enclosure 2, "SNC Calculation BM-95-0961-001, "Verification of CST Sizing basis", Version 6.0"

Letter from Ajluni (SNC) to NRC, "Joseph M. Farley Nuclear Plant - Units 1 and 2 Supplement to Response to Supplemental Information Request Regarding Technical Specifications Condensate Storage Tank Minimum Level License Amendment Request," dated November 8, 2012 (ADAMS Acession No. ML12319A150)

- Enclosure 1 (Proprietary), "Enclosure 1 - Enclosure 3 to letter dated October 25, 2012 SNC Calculation SM-SNC335993-001, "CST AFW Pump Suction -Submergence Analysis," Version 2.0." (Non Public ADAMS Accession No. ML12319A188)
    - Attachment 3 (Proprietary), SM-SNC335993-001, Version 2.0, "Vortex Evaluation for Vogtle and Farley *RWSTs and Hatch CSTs," Rev 0, FAI/09-19. (*referred to as (Fauske1. January 16, 2009) in the SE)

Letter from M. Ajluni (SNC) to NRC, "Joseph M. Farley Nuclear Plant – Units 1 and 2, Southern Nuclear Operating Company Response to Request for Additional Information Regarding the Revision of the Condensate Storage Tank Level," dated July 2, 2013 (ADAMS Accession No. ML13198A441).

- Enclosure 2, "CD Containing DOEJ-FRSNC419117-M001 Version 2, "CST Volume Requirements per Plant Transient Events" (ADAMS Accession No. ML13198A450).

Letter from M. Ajluni (SNC) to NRC, "Joseph M. Farley Nuclear Plant - Units 1 and 2, Supplement to Response for Additional Information Regarding Condensate Storage Tank Minimum Level License Amendment Request," dated June 16, 2014 (ADAMS Accession No. ML14167A493)

- Enclosure 2, "SNC Calculation SM-SNC335993-001, "CST AFW Pump Suction -Submergence Analysis," Version 3.0 (Proprietary)
- Enclosure 3, "SNC Calculation SM-SNC335993-001, "CST AFW Pump Suction -Submergence Analysis," Version 3.0 (Non-Proprietary)
- Enclosure 4, "Modified Response to Request for Additional Information Dated April 18, 2013
- Enclosure 5, "Fauske and Associates, LLC Report No. FAI/13-0392-P, "Request for Additional Information by the Office of Nuclear Reactor Regulation, Joseph M. Farley Nuclear Plants, Units 1 and 2, Southern Nuclear Operating Company, Docket Nos. 50-348 and 50-364, Revision 2" (Proprietary)
    - Attachment 3 - "Vortex Evaluation for Vogtle and Farley RWSTs and Hatch CSTs," FAI/09-19-P, Rev 1
- Enclosure 6, "Fauske and Associates, LLC Report No. FAI/13-0392-P, "Request for Additional Information by the Office of Nuclear Reactor Regulation, Joseph M. Farley

Nuclear Plants, Units 1 and 2, Southern Nuclear Operating Company, Docket Nos. 50-348 and 50-364, Revision 2" (Non-Proprietary)

Letter from R. Nease (NRC) to T. Lynch (SNC), "Joseph M. Farley Nuclear Plant, NRC Component Design Bases Inspection – Inspection Report (CDBI Report) 05000348/2011010 and 05000364/2011010," dated December 19, 2011 (ADAMS Accession No. ML113530575).

Energy, D. (February 10, 2014). *"License Amendment Request to Modify Technical Specification 3.3.1, Reactor Protection System (RPS) Instrumentation, (ADAMS Acession No. ML14052A065)*

[ ]

Fauske. (June, 2013). *"Request for Additional Information by the Office of Nuclear Reactor Regulation, Joseph M. Farley Nuclear Plants, Units 1 and 2, Southern Nuclear Operating Company, Docket Nos. 50-348 and 50-364," Report No.: FAI/13-0392, Revision 0.*

Fauske. (June, 2014). *"Request for Additional Information by the "Office of Nuclear Reactor Regulation Joseph M. Farley Nuclear Plants, Units 1 and 2 ...." FAI/13-0392-P, Rev 2.*

Harleman, D. R. (1959). *"Selective Withdrawal from a Vertically Stratified Fluid"*. Proceedings, Eighth Congress of the International Association for Hydraulics Research, Paper 10-C.

Jain, A. (1978). *"Air Entrainment in Radial Flow Toward Intakes"*. Journal of the Hydraulics Division, vol. 104, issue 9, pages 1323-1329.

[ ]

Lyon, W. C. (May 9, 2013). *"Meeting Minutes Covering the April 18, 2013 Closed Meeting to Discuss Gas Intrusion Due to Vortexing,"* NRC Memorandum, (ADAMS Accession No. ML13129A089)

Regulatory Guide 1.82, R. 4. (September, 2011). *"Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident".*

NUREG-0800, Section 9.2.5, NRC Branch Technical Position ASB 9-2, July 1981, Revision 2, "Residual Decay Energy for Light-Water Reactors for Long-Term Cooling," (ADAMS Accession No. ML052350549)

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August 15, 2014

Mr. C. R. Pierce
Regulatory Affairs Director
Southern Nuclear Operating Company, Inc.
P. O. Box 1295 / Bin - 038
Birmingham, AL 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2, ISSUANCE OF AMENDMENT REGARDING MINIMUM CONDENSATE STORAGE TANK LEVEL TECHNICAL SPECIFICATION (TAC NOS. ME9293 AND ME9294)

Dear Mr. Pierce:

The Nuclear Regulatory Commission has issued the enclosed 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, respectively. The amendments consists of changes to the Technical Specifications in response to your application dated August 20, 2012, as supplemented by letters dated October 25, 2012, November 8, 2012, July 2, 2013, and June 16, 2014.

The amendments revise the condensate storage tank level requirement specified in Technical Specification surveillance requirement 3.7.6.1. Specifically, the minimum required Condensate Storage Tank water inventory would be increased from 150,000 gallons to 164,000 gallons.

A copy of the related Safety Evaluation is also enclosed. Proprietary information was provided in the licensee's submittal and is included in Staff's evaluation. The proprietary information has been removed for the public version of the Safety Evaluation. The location of the proprietary information is identified by a vertical bar on the left margin and brackets [ ].
A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,
/RA/
Shawn A. Williams, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-348 and 50-364
Enclosures:
1. Amendment No. 195 to NPF-2
2. Amendment No. 191 to NPF-8
3. Safety Evaluation (Public Version)
4. Safety Evaluation (Non-Public Version)
cc w/encls 1,2, and 3: Distribution via Listserv

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Public | LPL2-1 R/F | RidsNrrDssStsb Resource | RidsNrrPMFarley Resource
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RidsRgn2MailCenter Resource | SSun; NRR | WLyon, NRR

ADAMS Accession No.: ML14155A302 *By memo

OFFICE	LPL2-1/PM	LPL2-1/LA	DSS/SRXB/BC*	DSS/SBPB/BC
NAME	SWilliams	SFigueroa	CJackson	GCasto
DATE	07/07/14	07/07/14	06/13/14 and 06/30/14	07/08/14
OFFICE	DSS/STSB/BC	OGC NLO w/comments	LPL2-1/BC	LPL2-1/PM
NAME	RElliott	BHarris	RPascarelli (GEMiller for)	SWilliams
DATE	07/09/14	08/12/14	08/15/14	08/15/14

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