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

August 7, 2012

Mr. M. J. Ajluni
Nuclear Licensing 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 AMENDMENTS ON SURVEILLANCE REQUIREMENT FOR POWER RANGE NEUTRON FLUX HIGH POSITIVE RATE TRIP (TAC NOS. ME7094 AND ME7095)

Dear Mr. Ajluni:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 189 to Renewed Facility Operating License No. NPF-2 and Amendment No. 184 to Renewed Facility Operating License No. NPF-8 for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (FNP) respectively, in response to your letters dated September 9, 2011, February 3 and March 30, 2012.

This amendment revised the FNP Technical Specification (TS) Table 3.3.1-1, "Reactor Trip System Instrumentation," to add Surveillance Requirement 3.3.1.14 for TS Table 3.3.1-1, Function 3, which is the Power Range Neutron Flux High Positive Rate Trip function.

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* notice.

Sincerely,

Robert Martin

Robert E. Martin, 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. 189 to NPF-2
2. Amendment No. 184 to NPF-8
3. Safety Evaluation

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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. 189
Renewed License No. NPF-2

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

   A. The application for amendment by Southern Nuclear Operating Company, Inc. (Southern Nuclear), dated September 9, 2011, as supplemented on February 3 and March 30, 2012, 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 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 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 and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 189, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

3. This amendment is effective as of its date of issuance and shall be implemented within 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John P. Boska for

Nancy Salgado, 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-2
and the Technical Specifications

Date of Issuance: August 7, 2012

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. 184
Renewed License No. NPF-8

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

   A. The application for amendment by Southern Nuclear Operating Company, Inc. (Southern Nuclear), dated September 9, 2011, as supplemented on February 3 and March 30, 2012, 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 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 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 and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 184, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

3. This amendment is effective as of its date of issuance and shall be implemented within 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

John P. Boska for

Nancy Salgado, 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-8
and the Technical Specifications

Date of Issuance: August 7, 2012

ATTACHMENT TO LICENSE AMENDMENT NOS. 189 AND 184

TO RENEWED FACILITY OPERATING LICENSE NOS. NPF-2 and NPF-8

DOCKET NOS. 50-348 AND 50-364

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

Remove Pages	Insert Pages
License	License
License No. NPF-2, page 4	License No. NPF-2, page 4
License No. NPF-8, page 3	License No. NPF-8, page 3
TS	TS
3.3.1-14	3.3.1-14

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 189, 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. 184, are hereby incorporated in the renewed license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications.

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE	TRIP SETPOINT
1.	Manual Reactor Trip	1,2	2	B	SR 3.3.1.12	NA	NA
		3 (a), 4 (a), 5 (a)	2	C	SR 3.3.1.12	NA	NA
2.	Power Range Neutron Flux						
	a. High	1,2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.14	≤ 109.4% RTP	≤ 109% RTP
	b. Low	1(b),2	4	E	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10 SR 3.3.1.14	≤ 25.4% RTP	≤ 25% RTP
3.	Power Range Neutron Flux High Positive Rate	1,2	4	D	SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.14	≤ 5.4% RTP with time constant ≥ 2 sec	≤ 5% RTP with time constant ≥ 2 sec
4.	Intermediate Range Neutron Flux	1(b), 2(c)	2	F,G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP
		2(d)	2	H	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.10	≤ 40% RTP	≤ 35% RTP

(a) With Reactor Trip Breakers (RTBs) closed and Rod Control System capable of rod withdrawal.

(b) Below the P-10 (Power Range Neutron Flux) interlocks.

(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 189 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-2 AND

AMENDMENT NO. 184 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 September 9, 2011, as supplemented by letters dated February 3 and March 30, 2012 (References 1, 3 and 4 respectively), Southern Nuclear Operating Company (SNC, the licensee) submitted a license amendment request (LAR) to change the Technical Specifications (TS) for the Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2. The change adds Surveillance Requirement (SR) 3.3.1.14 to FNP TS Table 3.3.1-1, "Reactor Trip System Instrumentation," Function 3, the Power Range Neutron Flux High Positive Rate Trip (PFRT) function. The SR requires verification that the PFRT response time is within limits. The NRC staff requested additional information to ensure that the methodology applied was consistent with NRC regulations and SNC responded in References 3 and 4.

The licensee stated the basis for its submittal of the LAR as follows:

> Nuclear Safety Advisory Letter (NSAL) 09-1 ["Rod Withdrawal at Power Analysis for Reactor Control System Overpressure,"] dated February 4, 2009..., issued by [Westinghouse Electric Company (Westinghouse)] Westinghouse discussed the potential for Reactor Coolant System (RCS) overpressurization as a result of a control rod bank withdrawal during power operation (RWAP) and the overall results of analyses crediting PFRT for this event. Westinghouse determined that the methodology used for the generic and plant-specific RWAP RCS overpressure analyses incorrectly assumed that a minimum initial power level creates the most limiting condition. Previous analyses have assumed an initial power level of 10 percent of rated thermal power (RTP), minus calorimetric uncertainty. Further investigation has identified cases from higher initial power levels that are more limiting. With the generic analysis key parameters and methodology, some cases exceeded the RCS overpressure limit for initial power levels in the range of 60 percent to 80 percent RTP.

Since these are the results of very conservative methodology, Westinghouse has concluded that a substantial safety hazard does not exist for Westinghouse PWRs or within the AP1 000 design certification. However, Westinghouse completed specific analyses for FNP Units 1 and 2 which addressed the potential for RCS overpressure following a RWAP. The results for FNP, using a conservative methodology, demonstrate that the RCS overpressure limit listed in FNP TS 2.1.2 (i.e., 2735 psig) is not violated, assuming that credit is taken for a PFRT at or below 9 percent of RTP with a lag time constant of 2 seconds and a trip delay time of 0.65 second.

The supplements dated February 3 and March 30, 2012, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 13, 2011 (76 FR 77572).

2.0 REGULATORY EVALUATION

The staff of the U.S. Nuclear Regulatory Commission considered the following regulatory requirements in its review of the license amendment request:

- Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," establishes the fundamental regulatory requirements with respect to the domestic licensing of nuclear production and utilization facilities. Specifically, the general design criteria (GDC) in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 provide, in part, the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety.

- GDC 13, "Instrumentation and Control," requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, anticipated operational occurrences, and accident conditions as appropriate to ensure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within prescribed operating ranges.

- GDC 15, "Reactor coolant system design," states that the RCS and associated auxiliary control, and protection systems shall be designed with sufficient margin to assure that the design conditions of the reactor coolant pressure boundary (RCPB) are not exceeded during any condition of normal operation, including anticipated operational occurrences.

- GDC 20, "Protection system functions," requires the protection system to be designed (1) to initiate automatically the operation of appropriate systems, including the reactivity control systems, to ensure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences, and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

- GDC 21, "Protection system reliability and testability," states that the protection system shall be designed for high functional reliability and in-service testability commensurate with the safety functions to be performed.

- GDC 22, "Protection system independence," through GDC 25, "Protection system requirements for reactivity control malfunctions," and GDC 29, "Protection against anticipated operational occurrences," require various design attributes for the protection systems, including independence, safe failure modes, separation from control systems, requirements for reactivity control malfunctions, and protection against anticipated operational occurrences.

- 10 CFR Section 50.55a paragraph (h), "Protection systems," states, in part, that "protective systems must meet the requirements stated in either IEEE Std. 279, "Criteria for Protection Systems for Nuclear Power Generating Stations," or in IEEE Std. 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations."

- Regulatory Guide 1.22 describes an acceptable method for ensuring that the protection system is designed to permit periodic testing of its functioning during reactor operation.

The NRC's regulatory requirements related to the content of the TSs are set forth in 10 CFR 50.36, "Technical specifications." 10 CFR 50.36 paragraph (c)(1)(ii)(A), "Safety limits, limiting safety system settings, and limiting control settings" requires limiting safety system settings to be included in the TSs and to be "so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded." 10 CFR 50.36(c)(3) requires that surveillance requirements relating to test, calibration, or inspection ensure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

Additionally, 10 CFR 50.36(c)(2)(ii) sets forth four criteria to be used in determining whether an LCO is required to be included in the TSs. These criteria are:

- Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary (RCPB);

- Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;

- Criterion 3: A structure, system, or component (SSC) that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier; and

- Criterion 4: An SSC which operating experience or probabilistic risk assessment (PRA) has shown to be significant to public health and safety.

3.0 TECHNICAL EVALUATION

The PFRT ensures that protection is provided against the rapid increases in neutron flux that are characteristic of a rod cluster control assembly drive rod housing rupture and the accompanying ejection of the assembly. The FNP safety analysis did not previously credit the PFRT for protection against anticipated transients or postulated accidents. However, based on a Westinghouse reanalysis of RWAP transient using more conservative analytical assumptions, the licensee has determined that the FNP safety analysis should credit the PFRT for primary protection. Therefore, the licensee proposed the revision of TS 3.3.1, "Reactor Trip System Instrumentation," by adding SR 3.3.1.14 to FNP TS Table 3.3.1-1, "Reactor Trip System Instrumentation," Function 3, to require verification of PFRT response times. SR 3.3.1.14 requires verification that the RTS RESPONSE TIME is within limits. SR 3.3.1.14 requires verification that the individual channel/train actuation response times are less than or equal to, the maximum values assumed in the accident analysis.

Response time testing acceptance criteria are included in Chapter 7 of FNP's Updated Final Safety Analysis Report (UFSAR). The UFSAR Table 7.2-5 currently lists the response time as N/A for PFRT item 3, because the PFRT has not been credited in the analysis of record (AOR) in UFSAR Chapter 15 in the past since the RWAP event was considered to be non-limiting with respect to RCS overpressure. Accordingly, the response time for the PFRT was not required to be verified in the past. SNC indicated in Reference 5 that the response time would be added in a forthcoming revision to FSAR Table 7.2-5, "Reactor Trip System Instrumentation Response Times."

Credit for three trip functions (high pressurizer pressure reactor trip, high power range neutron flux (High-PRNF) reactor trip, and PFRT) is required in order to meet the RCS pressure acceptance criterion (i.e., RCS peak pressure not in excess of 2735 psig). In the most limiting case analyzed, the high pressurizer pressure trip was responsible for tripping the reactor and arresting the RCS pressure rise at 2715.50 psia (2700.8 psig), meeting the RCS pressure acceptance criterion. However, the PFRT was responsible for initiating the trip in some of the other 679 cases analyzed. The results of the FNP analyses show that the RCS overpressure limit in TS 2.1.2 of 2735 pounds per square inch gauge (psig) is not violated, for a PFRT occurring at a value of at or below 9% of RTP with a lag time constant of 2 seconds and a trip delay time of 0.65 seconds. However, had the PFRT not been credited in some of the cases analyzed, the RCS pressure limit would have been exceeded.

The TS defines the RTS response time as that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor until loss of stationary gripper coil voltage. The licensee stated that the PFRT circuitry consists of the difference between the power range neutron flux (PRNF) signal and that same signal with a first order lag. Furthermore, both the High-PRNF and PFRT reactor trip signals are sent from the nuclear instrumentation system (NIS) to the reactor protection system via the same components and are processed from the same PRNF signals and identical bistables. The additional signal processing that forms the difference between the PRNF signal and the lagged PRNF signal does not add significant time delay for the PFRT. Therefore, the PFRT trip function has a response time similar to the High-PRNF trip function.

The licensee stated that the PFRT response time is verified in accordance with the NRC approved methodology in WCAP-14036-P-A (Reference 6). The approach is based on having performed an initial baseline RTS response time test. The licensee has reviewed preoperational test data and confirmed the response time of the NIS and solid state protection system (SSPS) for the PFRT during preoperational testing. The slowest response time measured for a channel was 0.235 seconds, confirming that the PFRT overall function response time is less than the 0.65 seconds specified by the Westinghouse analysis. This confirmation is based upon the response time measured during preoperational testing of the NIS and SSPS processing times, and the most recent surveillance data for the other related components. The NRC staff finds the response time verification as per the NRC-approved methodology of WCAP-14036-P-A and the subsequent conclusion that the PFRT function is capable of meeting the 0.65 seconds response time specified in the Westinghouse analysis to be acceptable.

The RWAP analysis assumed a PFRT Safety Analysis Limit (SAL) of 9% RTP with a lagging time constant of 2 seconds and a trip delay of 0.65 seconds. As listed in Table 3.3.1-1 of the marked-up TS pages supplied with the LAR, the nominal trip setpoint (NTS) is 5% RTP with a time constant of ≥2 seconds and the allowable value (AV) is ≤5.4% RTP with a time constant of ≥2 seconds. These setpoints help ensure the SAL limit is not exceeded. However, the NTS and AV listed in Table 3.3.1-1, Function 3, of the marked-up TS pages match those found in Table 3.3.1-1, Function 3, of the original TS pages, which were determined when no analyses took explicit credit for the PFRT. The licensee explained (Reference 5) that the NTS of 5% RTP and the AV of 5.4% RTP as found in the original TS pages were not calculated from the 9% RTP SAL, but were determined generically by considering typical uncertainties associated with the function. As such, no margins or Total Allowance (TA) were determined for the channel. The licensee further stated that since the PFRT function was now explicitly credited in the RWAP analyses, the TA for the channel had been reviewed and it had been confirmed that sufficient margin to the NTS and AV exists when considering uncertainties to ensure the SAL of 9% RTP would be protected. Based on this, the NRC staff finds the NTS of 5% RTP with a time constant of ≥2 seconds and the AV of 5.4% with a time constant of ≥2 seconds to be acceptable.

Note that SR 3.3.1.14 includes a note stating that neutron detectors are excluded from RTS response time testing because of the difficulty in generating an appropriate detector input signal. Specifically, the neutron detectors exhibit response-time characteristics such that delays attributable to them are negligible in the overall channel response time required for safety. Therefore, excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response (ADAMS Accession No. ML12037A011).

Surveillance Requirement 3.3.1.14 requires verifying that the reactor trip system response times are within limits in accordance with the Surveillance Frequency Control Program (SFCP). The testing includes the final actuation devices. The SFCP provides sufficient safety margin because the allocation time for sensors, signal conditioning and actuation logic would be verified prior to placing the component into service. In the response to the staff's RAI (ADAMS Accession No. ML12037A011), SNC explained that experience has shown that these components usually pass this surveillance when performed. SNC found that this is consistent with the rest of the Reactor Trip System signals Response Time Tests. Therefore, the selected surveillance test frequency is acceptable from a reliability standpoint. In addition, this selected surveillance test frequency is consistent with the current surveillance test frequency of other Power Range Neutron Flux functions of the RPS.

Reanalysis of a RWAP Event

The licensee indicated (Reference 1) that a reanalysis of 680 cases for an RWAP event initiating from various plant conditions and reactivity insertion rates was performed. All cases assumed reactor trips from the signals of (1) the High-PRNF trip at 118% RTP with a trip delay time of 0.5 seconds, (2) the high pressurizer pressure trip at 2440 psia with a trip delay time of 1 second, and (3) the PFRT at 9% RTP with a time constant of 2 seconds and a response time of 0.65 seconds for overpressure protection. The current Chapter 15.2.2 of the UFSAR documented the analysis of the RWAP event for FNP 1 and 2, for which the limiting acceptance criterion is the limit of the departure from nucleate boiling ratio (DNBR). The reanalysis in support of the addition of SR 3.3.1.14 to the PFRT was to ensure protection from over-pressurization of the RCS. SR 3.3.1.14 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. Chapter 7 of the FNP 1 and 2 UFSAR includes response time testing acceptance criteria. Response time may be verified by actual response time tests in any series of sequential, overlapping, or total channel measurements, or by the summation of allocated sensor, signal processing, and actuation logic response times with actual response time tests on the remainder of the channel.

The licensee indicated (Reference 1) that the RWAP reanalysis was performed with the NRC-approved code, LOFTRAN, documented in WCAP-7907-P-A (Reference 5). The code for the RWAP reanalysis was applied in accordance with the NRC's safety evaluation approving the topical report, and no methodology changes associated with the reanalysis were made. All cases were analyzed at minimum reactivity feedback conditions, because a RWAP at maximum reactivity feedback is a slower transient that would be less limiting in terms of RCS pressure. Sensitivity studies were performed for reactivity insertion rates from 15 pcm/sec to 110 pcm/sec and power levels from 8% to 102% of RTP. The results of the reanalysis are shown in Reference 1 as Figure 1, "Peak RCS Pressure versus Reactivity Rate," and Figure 2, "Peak RCS Pressure versus Power Fraction of RTP." The results in both Figures represent the 340 transient calculations initiating from a pressurizer pressure of 2200 psia and the 340 transient calculations for cases with an initial pressure of 2300 psia. Figure 1 shows that the peak RCS pressure is 2715.5 psia, which is based on a case with a reactivity insertion rate of 27 pcm/sec and an initial pressurizer pressure of 2200 psia. Figure 2 also shows the peak RCS pressure is 2715.5 psia, which is calculated for a case initiating from 75% RTP with an initial pressurizer pressure of 2200 psia. Both Figures 1 and 2 illustrate that the peak RCS pressure is less than the pressure limit of 2750 psia (2735 psig), meeting the GDC 15 requirements.

Since the method used for the RWAP reanalysis is an NRC-approved method, the values used for the key input parameters are conservative, resulting in a higher peak RCS pressure, and the results of a sensitivity study show that the peak RCS pressure is less than 2750 psia (110% of the design pressure of 2500 psia), meeting the GDC 15 requirements and, thus assuring integrity of the RCPB, the NRC staff concludes that the RWAP reanalysis is acceptable.

Compliance with the 10 CFR 50.36(d)(2)(ii) requirements

During the review, the NRC staff reviewed the PFRT function and the associated trip response time against the criteria specified in 10 CFR 50.36(c)(2)(ii) as follows:

- Criterion 1: The PFRT and trip response time are not used to detect and indicate a significant abnormal degradation of the RCPB.

- Criterion 2: The PFRT and trip response time are not a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient analysis.

- Criterion 3: Credit is taken for the PFRT and trip response time in the reanalysis of an RWAP event for protection from over-pressurization. The PFRT and delay time are considered as part of the primary success path related to the integrity of a fission product barrier. Therefore, the PFRT and the delay time are a SSC that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

- Criterion 4: The PFRT and trip response time are not an SSC which operating experience or PRA has shown to be significant to public health and safety.

Based on the above discussion, the NRC staff finds that the PFRT and trip response time satisfy Criterion 3 in 10 CFR 50.36(c)(2)(ii). The addition of SR 3.3.1.14 to Table 3.3.1-1, Function 3, is the appropriate requirement to verify that the response times are less than or equal to the maximum values assumed in the accident analysis.

4.0 SUMMARY

The NRC staff reviewed SNC's request to revise the FNP TS by adding SR 3.3.1.14 to Table 3.3.1-1, Function 3. Based on the considerations discussed above, the NRC staff concludes that the revisions are acceptable and will help ensure that the RCS pressure does not exceed the limit listed in FNP 1 and 2 TS 2.1.2. The NRC staff further concludes that SR 3.3.1.14 is an appropriate requirement for verifying that the PFRT response time, which satisfies criteria set forth in 10 CFR 50.36, is within acceptable limits; that the PRFT response time is less than that specified in the Westinghouse RWAP reanalysis; and that the system will perform its safety function with the analyzed response time. The NRC staff finds that the proposed revisions serve to satisfy, the applicable requirements set forth in GDC 13, 15, 20, 21 – 25, and 29.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Alabama State official was notified of the proposed issuance of the amendment. The State official had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes the surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (76 FR 77572). 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) 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.

8.0 REFERENCES

1. SNC letter, "License Amendment Request for Technical Specification Table 3.3.1-1," September 9, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112521438).

2. NRC letter requesting additional information, December 1, 2011, (ADAMS Accession No. ML11327A065)

3. SNC letter, Response to NRC Request for Additional Information, February 3, 2012, (ADAMS Accession No. ML12037A011).

4. SNC letter, Response to NRC Request for Additional Information, March 30, 2012, (ADAMS Accession No. ML12093A138).

5. WCAP-7907-P-A "LOFTRAN Code Description," April 1984. (ADAMS Accession No. ML080650325.

6. WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," December 1995. (ADAMS Accession No. ML100050325

Principal Contributors: A. Rossnyev
A. Kevin Heller

Date: August 7, 2012

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's Biweekly *Federal Register* notice.

Sincerely,

/RA/

Robert E. Martin, 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. 189 to NPF-2
2. Amendment No. 184 to NPF-8
3. Safety Evaluation

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