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Docket Numbers: 50-348 50-364

10 CFR 50.90

U.S. Nuclear Regulatory Commission ATTN: Document Control Desk Washington, DC 20555-0001

> Joseph M. Farley Nuclear Plant Technical Specifications Change Request Pressure Temperature Limits Report

Ladies and Gentlemen:

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In accordance with the provisions of 10 CFR 50.90, Southern Nuclear Operating Company (SNC) proposes to amend the Farley Nuclear Plant (FNP) Unit 1 and Unit 2 Technical Specifications by relocating the reactor coolant system pressure and tempera ure (P/T) limits from the Technical Specifications (TS) to the proposed Pressure Temperature Limits Report (PTLR) in accordance with the guidance provided by Generic Letter (GL) 96-03, Relocation of the Pressure Temperature Limit Curves and Low Temperature Overpressure Protection System Limits. The P/T limit curves contained in the proposed PTLR have been generated using the NRC-approved methodology contained in WCAP-14040-NP-A, Revision 2, Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves. All projected values contained in the proposed PTLR are based on the fluence associated with the power uprate submittal provided by SNC letter dated February 14, 1997. FNP utilizes the residual heat removal relief valves (RHRRVs) for low temperature overpressure protection (LTOP) and, consistent with the guidance contained in GL 96-03, the operability requirements for the LTOP system will be retained in the Technical Specifications.

The surveillance capsule withdrawal schedules contained in the proposed PTLRs have been updated to reflect the revised fluence methodology contained in WCAP-14040-NP-A, Revision 2. The proposed changes meet the requirements of ASTM E185-82 and in accordance with the requirements of 10 CFR 56, Appendix H, SNC requests approval of the revised surveillance capsule withdrawal schedules for FNP Unit 1 and Unit 2.

Following preparation of the PTLR, the Combustion Engineering Owners Group (CEOG) provided revised best-estimate chemistry values for the weld material heats used in fabrication of the FNP reactor vessels. SNC has reviewed the CEOG best-estimate chemistry values and determined that CEOG best-estimate values do not significantly impact the analysis contained in the PTLR. Specifically, FNP Unit 1 and 2 reactor vessels are both plate limited, with regard to the requirements of 10 CFR 50, Appendix G and 10 CFR 50.61, and the revised CEOG values do not result in either Unit becoming weld limited.

Enclosure I provides a safety assessment for the proposed changes. Enclosure 2 provides the basis for a determination that the proposed changes do not involve a significant hazards consideration pursuant to 10 CFR 50.92. Enclosures 3 and 4 provide the proposed changes to the Unit 1 and Unit 2 Technical Specifications, respectively. Enclosure 5 provides the Unit 1 and Unit 2 markedup Technical Specification pages. Enclosures 6 and 7 provide the proposed Unit 1 and Unit 2 PTLRs, respectively.

As denoted in 10 CFR 50.92(c), SNC has determined that the proposed changes to the FNP Technical Specifications do not involve a significant hazards consideration. The basis for this determination is provided by Enclosure 2. SNC has also determined that the proposed changes will not significantly affect the quality of the human environment. A copy of the proposed changes has been sent to Dr. D. E. Williamson, the Alabama State Designee, in accordance with 10 CFR 50.91(b)(1). Southern Nuclear Operating Company requests NRC approval of the proposed licensing changes by February 28, 1998 to support the uprate of FNP Units 1 and 2. The Unit 2 amendment should become effective prior to entering Mode 4 for Cycle 13 (Spring 1998), and the Unit 1 amendment should become effective prior to entering Mode 4 for Cycle 16 (Fall 1998).

Mr. D. N. Morey states that he is a vice president of Southern Nuclear Operating Company, and is authorized to execute this oath on behalf of Southern Nuclear Operating Company and that, to the best of his knowledge and belief, the facts set forth in this letter and enclosures are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

1997

Dave Morey Sworn to and subscribed before me this <u>23</u> day of July Carol Louise Jaylor Notary Public My Commission Expires June 24, 2001

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See Enclosures on next page

Enclosures:

- 1. Safety Assessment
- 2. 10 CFR 50.92 Evaluation
- 3. Unit 1 Technical Specification Pages
- 4. Unit 2 Technical Specification Pages
- 5. Unit 1 & 2 Marked-Up Technical Specification Pages
- 6. Unit 1 Pressure and Temperature Limit Report
- 7. Unit 2 Pressure and Temperature Limit Report
- cc: Mr. L. A. Reyes, Regional Administrator
  - Mr. J. I. Zimmerman, Licensing Project Manager, NRR
  - Mr. T. M. Ross, Senior Resident Inspector, Farley
  - Dr. D. E. Williamson, State Department of Public Health

### ENCLOSURE I

## Joseph M. Farley Nuclear Plant - Units 1 and 2 Pressure Temperature Limits Report Technical Specification Changes

Safety Assessment

### Introduction

The Farley Nuclear Plant (FNP) Unit 1 and Unit 2 Technical Specifications (TSs) for the reactor coolant system (RCS) pressure temperature (P/T) limit curves are proposed to be relocated to the Pressure Temperature Limits Report (PTLR), consistent with the guidance provided in Generic Letter (GL) 96-03, Relocation of the Pressure Temperature Limit Curves and Low Temperature Overpressure Protection System Limits. The P/T limits contained in the proposed PTLR. incorporate the NRC-approved methodology described in WCAP-14040-NP-A, Revision 2, Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves, and the fluence associated with uprated power. The license amendment request for power uprate was provided to the NRC by SNC letter dated February 14. 1997. In addition to use of the revised NRC-approved methodology and the fluence associated with uprated power, the proposed Unit 1 P/T limits incorporate the results from testing of Capsule W described in WCAP-14196, Analysis of Capsule W from the Alabama Power Company Farley Unit I Reactor Vessel Radiation Surveillance Program. The proposed FNP Unit 2 P/T limits are based on the fluence associated with the revised NRC-approved fluence methodology contained in WCAP-14040-NP-A, Rev. 2, the fluence associated with uprated power, and the results from testing of Capsule X described in WCAP-12471, Analysis of Capsule X from the Alabama Power Company Joseph M. Farley Unit 2 Reactor Vessel Radiation Surveillance Program.

The following provides a summary of the proposed changes:

- Revise FNP Unit 1 and Unit 2 RCS P/T limits valid through 36 EFPY. based on uprated power, in accordance with the NRC-approved methodology described in WCAP-14040-NP-A, Revision 2.
- Revise the Unit 1 and Unit 2 surveillance capsule withdrawal schedules based on the NRCapproved methodology contained in WCAP-14040-NP-A, Revision 2, and operation at uprated power.
- Addition of the definition of the Pressure Temperature Limits Report (PTLR) to Section 1.0 of the TSs.
- Relocation of RCS P/T limits from Technical Specification 3.4.10.1 to the PTLR in accordance with the guidance provided by GL 96-03.

- 5. Revise TSs Bases 3/4.4.10 to reference the PTLR as the source document for the P/T limit curves required by Technical Specification 3.4.10.1 and to incorporate, by reference, the NRC-approved methodolog; for generating P/T limits contained in WCAP-14040-NP-A. Revision 2. Additionally, the proposed change will revise Bases 3/4.10.1 to reference ASME Section XI. Appendix G, instead of ASME Section III, Appendix G, consistent with changes to 10 CFR 50, Appendix G (60 FR 65456, December 19, 1995).
- Delete Unit 1 TSs Bases Table B 3/4.4-1, Farley Unit 1 Reactor Vessel Toughness Properties, and Unit 2 Technical Specification Bases Table B 3/4.4-1, Reactor Vessel Toughness Data. This information is contained in FSAR Tables 5.2-24 and 5.2-25 for Unit 1 and Unit 2, respectively.
- Revise Technical Specification Bases Section 3/4.4.10 to eliminate detailed information regarding the methodology used to generate the P/i remperature limits that is either no longer applicable or is described in WCAP-14040-NP-A, Revision 2, which is incorporated by reference into the Bases.
- Clarify the description of the worst-case mass input transient used in the low temperature overpressure protection (LTOP) contained in Bases 3/4.4.10.
- Addition of Technical Specification 6.9.1.15 which provides the reporting requirements associated with the PTLR.

#### Safety Analysis Discussion and Evaluation

During the development of the improved standard technical specifications (STS), the NRC staff agreed to allow licensees to relocate the RCS P/T limits from the TSs to a licensee-controlled document, provided the parameters for constructing the curves and setpoints were derived using an NRC-approved methodology. GL 96-03, Relocation of the Pressure Temperature Limit Curves and Low Temperature Overpressure Protection System Limits, provided guidance to licensees for implementing this line item TS improvement. The guidance contained in GL 96-03 specifically requires licensees wishing to implement this line item TS improvement to:

- reference a methodology for developing the curves and setpoints that has been approved by the NRC;
- (2) develop a PTLR or a similar document that contains the figures, values, parameters, and any explanations derived from the methodology, and
- (3) make appropriate changes to the applicable sections of the TSs.

The following provides a description of the FNP Unit 1 and Unit 2 compliance with the requirements of GL 96-03:

(1) The P/T limits contained in the proposed PTLR are applicable through 36 effective full-power years (EFPY), and were generated in accordance with the methods described in WCAP-14040-NP-A, Revision 2, consistent with the requirements of 10 CFR 50, Appendix G, and Regulatory Guide 1.99, Revision 2. Additionally, the proposed P/T limits have been adjusted to account for the static and dynamic pressure differential between the reactor vessel beltline and the residual heat removal relief valves (RHRRVs) which provide low temperature overpressure protection for the RCS. Specifically, a 25 psi ΔP correction has been incorporated into the proposed P/T limits at RCS temperatures below 110°F, and a 60 psi ΔP correction incorporated at RCS temperatures at or above 110°F, consistent with the limits on RCP operation contained in Paragraph 2.2 of the PTLR. Incorporation of the ΔP associated with the number of operating RCPs in the P/T limits and restricting the number of operating RCPs at RCS temperatures below 110°F provides additional assurance that the RCS pressure at the reactor vessel beltline will not exceed the limits of Appendix G during an RCS pressure transient.

The NRC has reviewed the methods described in WCAP-14040-NP-A, and approved the topical report by issuance of Safety Evaluation Report (SER) dated October 16, 1995. The NRC concluded in its SER that WCAP-14040, Revision 1, satisfies the provisions described in a draft generic letter published in the *Federal Register* (60 FR 28805) for public comment on June 2, 1995, which was subsequently issued as GL 96-03, January 31, 1996. Revision 2 to WCAP-14040-NP-A simply incorporates the Westinghouse Owners Group response to NRC comments on Revision 1; incorporates the NRC SER approving WCAP-14040-NP-A, Revision 1; and adds the suffix NP-A to the report number to designate NRC approval of the report.

(2) The proposed PTLRs for FNP Unit 1 and Unit 2 meet the requirements contained in GL 96-03 and are included as Enclosure 6 and Enclosure 7 of this submittal, respectively. It should be noted that FNP utilizes the RHRRVs for low temperature overpressure protection in lieu of a microprocessor-based cold overpressure mitigation system (COMS) in conjunction with the power operated relief valves (PORVs). Consistent with the NRC SER for WCAP-14040-NP-A, Revision 2, and GL 96-03, the LTOP requirements will be retained in the TSs in their current form.

SNC has evaluated the ability of the RHRRVs to provide LTOP based on the proposed P/T limit curves and determined that a single RHRRV provides adequate relief capability to prevent the RCS pressure from exceeding the 10 CFR 50, Appendix G, steady-state limit during the worst-case heat or mass input transient at RCS temperatures less than or equal to 310°F. The worst-case heat input transient is defined as the start of a single RCP with a temperature difference of 50°F between the primary and secondary side of any one steam generator. The worst-case mass input transient is defined as the injection of the maximum number of operable charging pumps allowed by the TSs for a given temperature range into a water-solid RCS. The TSs specifically preclude the start of an RCP with one or more of the RCS cold leg temperatures less than or equal to 310°F unless (1) the pressurizer water volume is less than 770 ft<sup>3</sup> or (2) the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures, thus eliminating the potential for a heat

input transient more severe than the worst-case heat input transient assumed in the LTOP analysis. Additionally, the TSs specifically limit the number of operable charging pumps to one whenever the temperature of one or more of the RCS cold legs is less than or equal to 180°F, thus eliminating the potential for a mass input transient more severe than the worst-case mass input transient assumed in the LTOP analysis.

WCAP-14040-NP-A, Rev. 2, includes the method for determination of the LTOP enable temperature, consistent with Branch Technical Position (BTP) RSB 5-2, which is defined as the water temperature corresponding to a metal temperature of at least  $RT_{NDT} + 90^{\circ}F$ . The  $RT_{NDT} + 90^{\circ}F$  values for Farley Units 1 and 2 are 251°F and 276°F, respectively. Based on analysis performed by Westinghouse documented in WCAP-14689, Revision 1, Farley Units 1 and 2 Heatup and Cooldown Limit Curves for Normal Operation and PTLR Support Documentation, the RCS water temperature that corresponds to a metal temperature of 251°F for Unit 1 has been conservatively established to be 270°F which bounds all possible cases during heatup and cooldown. The Unit 2 RCS water temperature corresponding to a metal temperature of 276°F has been conservatively established to be 295°F which bounds all possible cases during heatup and cooldown. Therefore, alignment of the RCS to the RHR system at RCS temperatures equal to or less than 310°F, in accordance with the requirements of TS 3.4.10.3, meets the criteria set forth in Branch Technical Position RSB 5-2 for the LTOP enable temperature.

As discussed above, the LTOP enable temperature of  $310^{\circ}$ F is conservative in comparison to the value determined in accordance with WCAP-14040-NP-A, Rev. 2. Due to the 15°F margin (minimum) between the proposed LTOP enable temperature and the LTOP enable temperature determined in accordance with the methods of WCAP-14040-NP-A, Rev. 2, additional margin for instrument uncertainty associated with the LTOP enable temperature need not be incorporated into the proposed P/T limits. Since RCS LTOP is provided by passive, mechanical relief valves, instrument uncertainty associated with the relief valve setpoint is accounted for in the calibration of the RHRRVs (445 ± 5 psig), thus eliminating the need to incorporate additional margin for instrument uncertainty into the proposed P/T limits.

GL 96-03 also requires that licensees address the minimum boltup temperature for the reactor vessel head and closure flange. Consistent with the methods described in WCAP-14040-NP-A, Revision 2, the minimum boltup temperature for FNP Unit 1 and Unit 2 is 60°F as required by paragraph 2.1.1 of the proposed Unit 1 and Unit 2 PTLRs. Administrative controls for refueling operations require that the RCS temperature be greater than 68°F when fuel is in the vessel and that component cooling water be maintained at temperatures ranging from 60°F to 105°F, thus providing additional assurance that the reactor vessel head will not be fully tensioned at RCS temperatures less than the minimum boltup temperature.

- (3) Consistent with the guidance provided in GL 96-03, SNC provides the proposed TS changes associated with the PTLR as Enclosures 3 and 4 for FNP Unit 1 and 2, respectively. The proposed changes consist of the following:
  - (a) Modify TS Definitions, Section 1.0, to incorporate the definition for the Pressure Temperature Limits Report (PTLR).
  - (b) Modify the requirements of TS 3.4.10.1 to reference the PTLR as the source document for the P/T limits required by TS 3.4.10.1.

- (c) Modify Bases Section 3/4.4.10 to reference the PTLR as the source document for the P/T limits required by TS 3.4.10.1, and identify Westinghouse Topical Report WCAP-14040-NP-A, Revision 2, as the methodology to be used to recalculate the P/T limits.
- (d) Miscellaneous changes to TS Bases 3/4.4.10 to remove detail that is either no longer applicable or duplicates information contained in WCAP-14040-NP-A, Revision 2. Additional clarification to the limiting mass input transient for the reactor coolant system was incorporated into TS Bases 3/4.4.10.
- (e) Modify TS Administrative Controls, Section 6.9.1.15, to specify the analytical methods described by WCAP-14040-NP-A, Revision 2, as the NRC-approved methodology for determining the RCS P/T limits required by TS 3.4.10.1.
- (f) Modify TS Administrative Controls, Section 6.9.1.15, to require submittal of the PTLR to the NRC upon issuance for each reactor fluence period and for any revision or supplement thereto.

Based on items (1), (2), and (3) above, the proposed FNP Unit 1 and Unit 2 PTLRs, and the proposed changes to the TS, meet the requirements of GL 96-03. The FNP P/T limits will be generated in accordance with the NRC-approved methodology described in WCAP-14040-NP-A. Revision 2, and the plant will continue to be operated in accordance with the ECS P/T limits as required by TS 3.4.10.1. Therefore, FNP will continue to meet the requirements of 10 CFR 50, Appendices G and H, thus assuring that the integrity of the reactor vessel will be maintained.

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# **ENCLOSURE 2**

Joseph M. Farley Nuclear Plant - Units 1 and 2 Pressure Temperature Limits Report Technical Specification Changes

10 CFR 50.92 Evaluation

## **ENCLOSURE 2**

## Joseph M. Farley Nuclear Plant - Units 1 and 2 Pressure Temperature Limits Report Technical Specification Changes

### 10 CFR 50.92 Evaluation

Pursuant to 10 CFR 50.92, SNC has evaluated the proposed amendments and has determined that operation of the facility in accordance with the proposed amendments would not involve a significant hazards consideration. The basis for this determination is as follows:

1. The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed removal of the Reactor Coolant System (RCS) pressure temperature (P/T) limits from the Technical Specifications (TSs) and relocation to the proposed Pressure Temperature Limits Report (PTLR) in accordance with the guidance provided by Generic Letter (GL) 96-03 is administrative in that the requirements for the P/T limits are unchanged. The P/T limits proposed for inclusion in the PTLR are based on the fluence associated with 2775 MW thermal power and operation through 36 effective full power years (EFPY). GL 96-03 requires that the P/T limits be generated in accordance with the requirements of 10 CFR 50 Appendices G and H, documented in an NRC-approved topical report incorporated by reference in the TSs. Accordingly, the proposed curves have been generated using the NRCapproved methods described in WCAP-14040-NP-A, Revision 2, and meet the requirements of 10 CFR 50, App indices G and H. TS 3.4.10.1 will continue to require that the RCS pressure and temperature be limited in accordance with the limits specified in the PTLR. The NRCapproved methodology for generating the P/T limits, WCAP-14040-NP-A. Revision 2, will be specified in TS 6.9.1.15 and NRC approval will be required in the form of a TS Amendment prior to changing the methodology. Use of P/T limit curves generated using the NRCapproved methods described in WCAP-14040-NP-A, Revision 2, as specified by TS 6.9.1.15. will provide additional protection for the integrity of the reactor vessel, thereby assuring that the reactor vessel is capable of providing its function as a radiological barrier.

TS 3.4.10.3 for Farley Nuclear Plant (FNP) Unit 1 and Unit 2 provides the operability requirements for RCS low temperature overpressure protection (LTOP). Specifically, TS 3.4.10.3 requires that two residual heat removal (RHR) system suction relief valves (RHRRVs) be operable or that the RCS be vented at RCS cold leg temperatures less than or equal to 310°F. GL 96-03 recognizes that RHRRVs do not have variable pressure lift setpoints and states that those plants that rely on the RHRRVs for LTOP should continue to address the LTOP requirements in the TS. Consistent with GL 96-03, the Farley Unit 1 and Unit 2 requirements for LTOP will be retained in TS 3.4.10.3.

Based on the above evaluation, the proposed changes are administrative in nature and do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. The proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

As stated above, the proposed changes to remove the RCS P/T limits from the TSs and relocate them to the proposed PTLR is an administrative change. Consistent with the guidance provided by GL 96-03, the proposed P/T limits contained in the proposed PTLR meet the requirements of 10 CFR 50, Appendices G and H, and were generated using the NRCapproved methods described in WCAP-14040-NP-A. Revision 2. The proposed changes do not result in a physical change to the plant or add any new or different operating requirements on plant systems, structures, or components with the exception of limiting the number of operating RCPs at RCS temperatures below 110°F. Limiting the number of operating RCPs below 110°F results in a reduction in the  $\Delta P$  between the reactor vessel beltline and the RHRRVs, thereby providing additional margin to limits of Appendix G. Provisions are made to allow the start of a second RCP at temperatures below 110°F in order to secure the pump that was originally operating without interrupting RCS flow. The LTOP enable temperature exceeds the minimum LTOP enable temperature determined using the NRC-approved methods described in WCAP-14040-NP-A, Rev. 2, thereby providing additional assurance that the LTOP system will be available to protect the RCS in the event of an overpressure transient at RCS temperatures at or below 310°F. Using the methods contained in WCAP-14040-NP-A. Rev. 2, the minimum boltup temperature for the reactor vessel flange region is 60°F which is less than the design limits of the fuel cladding. Administrative controls require a minimum RCS temperature of 68°F when fuel is loaded in the reactor vessel to protect against brittle failure of the fuel cladding, and also require that the component cooling water (CCW) temperature be maintained between 60°F and 105°F during refueling operations, thus reducing the potential for the RCS temperature to be less than the minimum boltup temperature specified in the proposed PTLRs.

As stated in the above response, implementation of the proposed changes do not result in a significant increase in the probability of a new or different accident (i.e., loss of reactor vessel integrity). The RCS P/T limits will continue to meet the requirements of 10 CFR 50, Appendices G and H, and will be generated in accordance with the NRC approved methodology described in WCAP-14040-NP-A, Rev. 2. Therefore, the proposed changes do not result in a significant increase in the possibility of a new or different accident from any previously evaluated.

3. The proposed change does not involve a significant reduction in a margin of safety.

The margin of safety is not affected by the removal of the RCS P/T limits from the TSs and relocating them to the proposed PTLR. The RCS P/T limits will continue to meet the requirements of 10 CFR 50, Appendices G and H. To provide additional assurance that the P/T limits continue to meet the requirements of Appendices G and H, TS 6.9.1.15 will require the use of the NRC-approved methodology described in W/. AP-14040-NP-A, Rev. 2, to generate P/T limits. The RCS LTOP requirements will be retained in TS 3.4.10.3 due to use of the RHRRVs for LTOP, consistent with the guidance provided by GL 96-03. The LTOP enable temperature exceeds the LTOP enable temperature determined in accordance with the NRC-approved methodology, thus protecting the RCS in the event of a low temperature overpressure transient over a broader range of temperatures than required by WCAP-14040-NP-A, Rev. 2. Administrative procedures preclude operation of the RCS at temperatures below the minimum boltup temperature for the reactor vessel head, thus precluding the possibility of tensioning the reactor vessel head at RCS temperatures below the minimum

boltup temperature. Operation of the plant in accordance with the RCS P/T limits specified in the PTLR and continued operation of the LTOP system in accordance with TS 3.4.10.3 will continue to meet the requirements of 10 CFR 50, Appendices G and H, and will therefore, assure that a margin of safety is not significantly decreased as the result of the proposed changes.

Based on the preceding analysis, SNC has determined that removal of the RCS P/T limits from the TS and relocation to the proposed PTLR will not significantly increase the probability or consequences of an accident previously evaluated, create the possibility of a new or different kind of accident from any accident previously evaluated, or involve a significant reduction in a margin of safety. SNC therefore concludes that the proposed change meets the requirements of 10 CFR 50.92(c) and does not involve a significant hazards consideration.

(a)