Progress Energy

AUG 02 2006

Serial: HNP-06-089
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
TO REVISE VALUES ASSOCIATED WITH THE STEAM GENERATOR WATER LEVEL (SGWL) TRIP SETPOINTS

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, Carolina Power and Light Company (CP&L) doing business as Progress Energy Carolinas, Inc., requests a license amendment for the Harris Nuclear Plant (HNP) Technical Specifications (TS). The proposed amendment will modify the statistical summation error term "Z" and one of the allowable values for certain steam generator water level (SGWL) trip setpoints used in the Reactor Trip System (RTS) and Engineered Safety Feature Actuation System (ESFAS) instrumentation. The proposed amendment is necessary to address recent generic issues involving SGWL measurement uncertainty considerations associated with Westinghouse-designed steam generators.

Attachment 1 provides the description, background, and technical analysis for the proposed change.

Attachment 2 details, in accordance with 10 CFR 50.91(a), the basis for HNP's determination that the proposed change does not involve a significant hazards consideration.

Attachment 3 provides the proposed TS changes.

Attachment 4 provides the revised TS changes.

Attachment 5 provides the calculation to support the proposed changes.

The TS Bases are not affected by the proposed amendment.

With respect to this proposed amendment, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite and there is no significant increase in individual or cumulative occupational radiation

Progress Energy Carolinas, Inc.
Harris Nuclear Plant
P. O. Box 165
New Hill, NC 27562

A001

exposure. The proposed change to the Technical Specifications meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental assessment or environmental impact statement is required for approval of this application.

In accordance with 10 CFR 50.91(b), HNP is providing the State of North Carolina with a copy of the proposed license amendment.

HNP requests approval of the proposed amendment by August 2007. Once approved, the amendment will be implemented within 60 days.

This document contains no new Regulatory Commitment.

Please refer any question regarding this submittal to Mr. Dave Corlett at (919) 362-3137.

I declare, under penalty of perjury, that the attached information is true and correct (Executed on AUG 02 2006).

Sincerely,

C. S. Kamilaris
Manager, Site Support Services
Harris Nuclear Plant

CSK/jpy

Attachments:

1. Description, Background, and Technical Analysis
2. 10 CFR 50.92 No Significant Hazards Evaluation
3. Proposed Technical Specifications (TS) Changes
4. Revised Technical Specifications (TS) Pages
5. Calculation No. HNP-I/INST-1010

c:
Mr. R. A. Musser, NRC Senior Resident Inspector
Ms. B. O. Hall, N.C. DENR Section Chief
Mr. C. P. Patel, NRC Project Manager
Dr. W. D. Travers, NRC Regional Administrator

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Description

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, "Application for amendment of license or construction permit," Carolina Power and Light Company (CP&L) doing business as Progress Energy Carolinas, Inc., requests a license amendment for the Harris Nuclear Plant (HNP) Technical Specifications (TS). The proposed amendment will modify the statistical summation error term "Z" and one of the allowable values for certain steam generator water level (SGWL) trip setpoints used in the Reactor Trip System (RTS) and Engineered Safety Feature Actuation System (ESFAS) instrumentation, but it does not change any trip setpoints described in the TS. The proposed amendment is necessary to address recent generic issues involving SGWL measurement uncertainty considerations associated with Westinghouse-designed steam generators.

Specifically, HNP proposes to revise TS Section 2.2.1 (Table 2.2-1, Items 13 & 14) and Section 3/4.3.2 (Table 3.3-4, Items 5.b & 6.c) to reflect: 1) increases in the statistical summation error term "Z" for SGWL Low-Low RTS trip setpoint, SGWL Low Coincident with Steam/Feedwater (FW) Flow Mismatch RTS trip setpoint, SGWL High-High Turbine Trip and FW Isolation ESFAS trip setpoint, and SGWL Low-Low Auxiliary Feedwater (AFW) Actuation ESFAS trip setpoint; and 2) an effective decrease in the allowable value (AV) for the SGWL Low Coincident with Steam/FW Flow Mismatch RTS trip setpoint. For clarity, the existing (old) and proposed (new) values are detailed in the table below.

RTS/ESFAS Trip Setpoint	Z Term		Allowable Value	
	Old	New	Old	New
SGWL Low-Low RTS Trip Setpoint (≥25%) Table 2.2-1, Item 13	16.85%	**17.45%**	≥23.5%	No Change
SGWL Low Coincident with Steam/FW Flow Mismatch RTS Trip Setpoint (≥25%) Table 2.2-1, Item 14	5.35%	**5.95%**	≥23.5%	**≥24.05%**
SGWL High-High (P-14) Turbine Trip & FW Isolation ESFAS Trip Setpoint (≤78.0%) Table 3.3-4, Item 5.b	8.05%	**8.15%**	≤79.5%	No Change
SGWL Low-Low AFW Actuation ESFAS Trip Setpoint (≥25%) Table 3.3-4, Item 6.c	16.85%	**17.45%**	≥23.5%	No Change

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Background

The following regulatory bases and guidance and industry guidance are applicable to the systems discussed in the proposed amendment:

In accordance with General Design Criterion (GDC) 15, *Reactor Coolant System Design*, of Appendix A, *General Design Criteria For Nuclear Power Plants*, to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR), the reactor coolant system (RCS) and associated auxiliary, control, and protection systems shall be designed with sufficient margin to assure that the design conditions of the RCS pressure boundary are not exceeded during any condition of normal operation, including anticipated operational occurrences (AOOs).

In accordance with GDC 20, *Protection System Functions*, of Appendix A, *General Design Criteria For Nuclear Power Plants*, to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR), the protection system shall be designed 1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of AOOs and 2) to sense accident conditions and to initiate the operation of systems and components important to safety.

Paragraph (c)(ii)(A) of 10 CFR 50.36, *Technical specifications*, requires that the TS include limiting safety system settings. This paragraph specifies, among other things, that "where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded." Accordingly, limits for instrument channels that initiate protective functions must be included in the TS.

Regulatory Guide (RG) 1.105, *Setpoints for Safety-Related Instrumentation*, describes a method acceptable to the NRC staff for complying with the NRC regulations for assuring that setpoints for safety-related instrumentation are initially within and remain within the TS limits. HNP meets the intent of this RG as described in HNP FSAR Section 1.8.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Background (continued)

The NRC issued Information Notice (IN) 2002-10, *Nonconservative Water Level Setpoints on Steam Generators*, on March 7, 2002, to alert holders of operating licenses to the potential for non-conservative setpoints of the steam generator water level (SGWL). The IN was issued as a result of a February 9, 2002, occurrence at Diablo Canyon, Unit No. 2, where the SGWL narrow range (NR) instrumentation did not respond as expected to initiate an automatic reactor trip and AFW system actuation on the SGWL low-low signal during a plant trip. This event prompted Westinghouse, the steam generator (SG) manufacturer, to issue various Nuclear Safety Advisory Letters (NSALs).

As discussed in NSAL-02-3, Revision 1, *Steam Generator Mid-deck Plate Pressure Loss Issue*, dated April 8, 2002, Westinghouse attributed the water level measurement uncertainties mainly to a differential pressure (ΔP), previously unaccounted for, created by steam flow past the mid-deck plate in the moisture separator section of the SG. Westinghouse-designed SGs incorporate a mid-deck plate at the top of the primary separator assembly between the upper and lower taps used for the SGWL NR instruments. The installation of the mid-deck plate is to reduce moisture carryover. When some of the steam flows through the separator downcomer, instead of the primary separator orifice, this steam with some entrained moisture will flow upwards through the flow area in the mid-deck plate, creating a pressure differential. The mid-deck plate ΔP, which is a function of steam flow, causes the SGWL NR instrumentation to read higher than the actual water level, and adversely affects the SGWL low-low trip with an uncertainty bias in the non-conservative direction. Therefore, the SGWL instrumentation without accounting for this ΔP phenomenon could be non-conservative during certain transients.

NSAL-02-4, *Maximum Reliable Indicated Steam Generator Water Level*, dated February 19, 2002, dealt with uncertainties in the measurement created by the void content of the two-phase mixture above the mid-deck plate that is not reflected in the calculation. The NSAL indicated that the uncertainties may adversely affect the SGWL high-high trip signal for actuation of the turbine trip and feedwater system isolation in the non-conservative direction.

NSAL-02-5, *Steam Generator Water Level Control System Uncertainty Issue*, dated April 22, 2002, dealt with potential inaccuracies in the initial water level assumed in the design transient analyses affected by SGWL uncertainties. The NSAL indicated that the analyses may not be bounding because the velocity head under some conditions may increase the uncertainties in the SGWL control system.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Background (continued)

Westinghouse undertook a program for the Westinghouse Owners Group (WOG) to evaluate the effects of the following items on SGWL control systems uncertainties: mid-deck plate, feedwater ring and feedwater ring supports, lower-deck plate supports, non-recoverable losses due to carryunder, decrease in subcooling due to carryunder, as well as transient conditions due to events such as the loss of normal feedwater, or a steamline break outside containment. Under the program, Westinghouse evaluated the design features of Westinghouse-designed SGs and other phenomena associated with Westinghouse SGs as they affect uncertainties in terms of the SGWL control system, and the SGWL low-low and high-high RTS/ESFAS trip functions. The results of the program were summarized in WCAP-16115-P, *Steam Generator Level Uncertainties Program*, dated September 2003, and were transmitted to the affected plants under NSAL-03-9, *Steam Generator Water Level Setpoint Analysis*, dated September 22, 2003. The technical findings identified in WCAP-16115-P and the recommended actions of NSAL-03-9 were evaluated to identify the specific impact to the HNP uncertainty analysis for SGWL instrumentation.

Subsequent to the release of WCAP-16115-P and NSAL-03-9, Westinghouse issued Technical Bulletin 04-12 (WTB-04-12), *Steam Generator Level Process Pressure Evaluation*, dated June 23, 2004, which identified a methodology inaccuracy in calculating the impact of process pressure on the indicated SGWL at conditions other than 100% RTP. Due to transient effects, the steam generator process pressure could potentially vary more than 400 pounds per square inch (psi), and directly impact the fluid density in the reference leg. This reference leg density variation is significantly large, such that an additional term must be included to model the effect of process pressure on the subcooled water density in the reference leg under transient conditions. WTB-04-12 was evaluated to identify the specific impact to the HNP uncertainty analysis for SGWL instrumentation, and the results are discussed in the Technical Analysis Section below.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis

This technical analysis is divided into three parts:
1) A discussion of the reactor trip signals and actuation signals impacted by the proposed amendment;
2) Impacts to the process measurement accuracy (PMA) values of the setpoint uncertainty analysis for the RTS/ESFAS signals impacted by the proposed amendment; and
3) A summary of the important analytical changes as a result of these new PMA values.

Part 1 – Reactor Trip Signals and Actuation Signals Impacted

The purpose of the Reactor Trip System/Engineered Safety Features Actuation System (RTS/ESFAS) is to process input signals from selected plant parameters and send a Reactor Trip Signal to the Reactor Trip Breakers or actuation signals to the Engineered Safety Features Equipment when abnormal plant conditions exist. The RTS and ESFAS ensure the integrity of the Reactor Systems and avoid undue risk to the health and safety of the public by allowing reactor operation within prescribed safe limits, preventing reactor operation outside these limits, and mitigating the consequences of primary or secondary system boundary ruptures. The system also provides interlocks or permissives to limit the severity of accidents at lower power levels.

Steam Generator Water Level (SGWL) Low-Low - The purpose of this RTS and ESFAS signal is to protect the reactor by preventing operation without adequate heat removal capability. This circuit trips the reactor if two out of three of the level indicators of any one steam generator indicate below the low-low trip setpoint of 25% narrow range (NR) SGWL. The motor-driven auxiliary feedwater pumps (AFW) are automatically started if the trip condition occurs. If two out of three steam generators indicate below the trip setpoint for two out of three transmitters, the steam-driven auxiliary feedwater pump will start.

SGWL Low Coincident with Steam/Feedwater Flow Mismatch - This RTS signal is provided to prevent a sudden loss of heat sink and is actuated when the steam flow from one steam generator exceeds the feedwater flow to the same steam generator by 40% of rated steam flow coincident with a low SGWL (25% NR). For each steam generator, there are two SGWL circuits and two steam/feedwater flow mismatch circuits. Any pair of the required coincident signals will generate a reactor trip.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis (continued)

SGWL High-High (Permissive P-14) - This ESFAS signal supplies an input to trip the turbine, trip the main feedwater pumps, and isolate the feedwater system if any one of the steam generators (two out of four coincidence on each steam generator) exceeds the P-14 level setpoint (78% NR). This signal functions to protect the turbine against water damage due to carry over or steam generator overfilling with water. Main feedwater isolation also prevents or mitigates the effect of excessive cooldown.

Revisions to the SGWL RTS and ESFAS setpoint uncertainty analysis contained in calculation HNP-I/INST-1010 (Attachment 5) have been performed consistent with the HNP procedural requirements for methodology and scope concerning instrument uncertainty and scaling calculations for Limited Safety System settings. These procedural requirements are based on the technical and regulatory requirements set forth in the HNP FSAR, industry standards, and Regulatory Guide 1.105 as described in HNP FSAR Section 1.8.

Per HNP FSAR Section 7.2.1.2.6.b, *Reactor Trip Accuracies*, calculations of record for these Limiting Safety System settings have been prepared in accordance with the company methodology for instrument loop uncertainty analysis and setpoint determination.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis (continued)

Part 2 – Process Measurement Accuracy (PMA) Impacts

PMA – Mid-deck Plate Differential Pressure (ΔP)

WCAP-16115-P (September 2003) evaluated additional issues identified by the WOG that could also affect SG water level uncertainties. Section 6.1 of the WCAP discusses the effect of single loop loss of normal feedwater (LONF) on SGWL low-low. A single loop LONF analysis was performed to determine and support an upper-bounding steam flow value at 100% rated thermal power (RTP). The upper-bounding steam flow value was determined to be equal to 112% of nominal steam flow for feedwater ring type SGs. Plant-specific mid-deck plate ΔP values of 0.130 psi, 0.138 psi, and 0.144 psi corresponding to 100%, 112%, and 121% steam flow, respectively, were tabulated in Table 6-1 of WCAP-16115-P for all Westinghouse-designed SGs. The Westinghouse calculation note CN-TSS-98-19 was used as the source document for HNP calculation HNP-I/INST-1010 (Attachment 5). The mid-deck plate ΔP used in these calculations was 0.130 psi for 100% steam flow. WCAP-16115-P changed the requirement to consider 119.6% steam flow as the bounding value (as presented in Table 6-3 of the WCAP) rather than the 100% value used originally, so a new PMA value was calculated based on the equation presented in Westinghouse calculation note CN-TSS-98-19.

This new PMA value, which accounts for the mid-deck plate ΔP, was used in determining the impact to the SGWL RTS and ESFAS setpoint uncertainty analysis of calculation HNP-I/INST-1010 (Attachment 5) for the following trip setpoints: SGWL Low-Low (FW line break and LONF) and SGWL Low Coincident with Steam/FW Flow Mismatch.

PMA – Lower-deck Plate ΔP

Section 6.4 of WCAP-16115-P discusses the effects of feedwater malfunction/ excessive feedwater on the SGWL High-High trip setpoint. Table 6-4 of the WCAP provides a "Compilation of SG Model DP Effect Magnitudes and Selected Resulting Uncertainties-Feedwater Malfunction Transient Conditions for High-High Level Trip." For the Delta 75 SGs installed at HNP, the only effect identified is an additional pressure drop due to the lower-deck plate supports of 0.006 psi. Westinghouse calculation note CN-TSS-98-19 did not identify this additional measurement uncertainty since the effect was not known prior to the issuance of the WCAP. Therefore, a separate PMA bias term for lower-deck plate supports was included as part of the revised uncertainty calculation for the SGWL High-High trip setpoint uncertainty analysis.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis (continued)

This new PMA value, which accounts for the lower-deck plate ΔP, was used in determining the impact to the SGWL RTS and ESFAS setpoint uncertainty analysis of calculation HNP-I/INST-1010 (Attachment 5) for the SGWL High-High trip setpoint.

PMA – Process Pressure Under Transient Conditions

WTB-04-12 identified a methodology inaccuracy in calculating the impact of process pressure on the indicated steam generator level at conditions other than 100% RTP. Due to transient effects, the steam generator process pressure could potentially vary more than 400 psi and directly impact the fluid density in the reference leg. This reference leg density variation may require an additional term to be included to model the effect of process pressure on the subcooled water density in the reference leg under transient conditions. Westinghouse calculation note CN-TSS-98-19 used an equation to derive the process pressure measurement uncertainty. However, this equation assumes that the fluid temperature is at the saturation temperature corresponding to the specific pressure and does not consider the effect of process pressure on the fluid density in the reference leg at transient conditions. Therefore, HNP used the equation recommended in WTB-04-12 to address the effects of process pressure on the fluid density in the reference leg at conditions other than steady state 100% RTP.

New PMA values, which account for the process pressure under transient conditions, were used in determining the impact to the SGWL RTS and ESFAS setpoint uncertainty analysis of calculation HNP-I/INST-1010 (Attachment 5) for the following SGWL trip setpoints: SGWL Low-Low (FW line break and LONF), SGWL Low Coincident with Steam/FW Flow Mismatch, and SGWL High-High.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis (continued)

Part 3 – Summary of Important Analytical Changes

The SGWL RTS and ESFAS setpoint uncertainty analysis of Calculation HNP-I/INST-1010 (Attachment 5) was revised based on the modified PMA terms discussed above. Revision 3 of calculation HNP-I/INST-1010 has been included as Attachment 5 of this letter. The channel statistical allowance (CSA) value for each SGWL trip setpoint (i.e., SGWL Low-Low (FW line break and LONF), SGWL Low Coincident with Steam/FW Flow Mismatch, and SGWL High-High) increased slightly. However, an adequate calculational margin still exists between the TS total allowance (TA) value and the revised CSA value for each analyzed trip setpoint. Based on an increase in the CSA values, the TS "Z" term for each SGWL trip setpoint also increased. The TS "Z" term represents the statistical summation of analysis errors excluding sensor, rack drift and calibration uncertainties. The TS allowable value (AV) for the SGWL Low trip setpoint was effectively decreased based on the calculational methodology used in HNP-I/INST-1010 and an increased "Z" term for this function. The TS AV accommodates instrument drift assumed between periodic surveillance testing and the accuracy to which the trip setpoint can be measured and calibrated.

HNP TS Section 2.2.1 (Table 2.2-1, Items 13 & 14) and Section 3/4.3.2 (Table 3.3-4, Items 5.b & 6.c) will require revision as a result of the analytical changes to reflect: 1) increases in the statistical summation error term "Z" for SGWL Low-Low RTS trip setpoint, SGWL Low Coincident with Steam/Feedwater (FW) Flow Mismatch RTS trip setpoint, SGWL High-High Turbine Trip and FW Isolation ESFAS trip setpoint, and SGWL Low-Low Auxiliary Feedwater (AFW) Actuation ESFAS trip setpoint; and 2) an effective decrease in the allowable value (AV) for the SGWL Low Coincident with Steam/FW Flow Mismatch RTS trip setpoint.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis (continued)

For clarity, a summary of the important analytical changes to HNP-I/INST-1010 (Attachment 5) are tabulated below with the existing (old) and proposed (new) values detailed.

RTS/ESFAS Trip Setpoint	CSA		Z Term		Allowable Value	
	Old	New	Old	New	Old	New
SGWL Low-Low RTS Trip Setpoint (≥25%) Table 2.2-1, Item 13	18.67%	**19.27%**	16.85%	**17.45%**	≥23.5%	No Change
SGWL Low Coincident with Steam/FW Flow Mismatch RTS Trip Setpoint (≥25%) Table 2.2-1, Item 14	7.17%	**7.77%**	5.35%	**5.95%**	≥23.5%	**≥24.05%**
SGWL High-High (P-14) Turbine Trip & FW Isolation ESFAS Trip Setpoint (≤78.0%) Table 3.3-4, Item 5.b	9.87%	**9.97%**	8.05%	**8.15%**	≤79.5%	No Change
SGWL Low-Low AFW Actuation ESFAS Trip Setpoint (≥25%) Table 3.3-4, Item 6.c	7.17%	**7.77%**	16.85%	**17.45%**	≥23.5%	No Change

The revised analysis of HNP-I/INST-1010 (Attachment 5) conservatively accounts for the addition of new PMA values in determining SGWL and results in acceptable, but decreased calculational margins between the total allowances and the CSAs for the specified SGWL RTS/ESFAS setpoint values. In addition, the revised analysis results in a more conservative AV for the SGWL Low Coincident with Steam/FW Flow Mismatch RTS trip setpoint, which ensures that the setpoint remains acceptable between periodic surveillance tests. A review of past as-found calibration data for each of the six SGWL instrument loops has confirmed that the revised AV still provides sufficient margin to accommodate random instrument drift and equipment measurement inaccuracies between scheduled calibrations without exceeding the specified limit.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

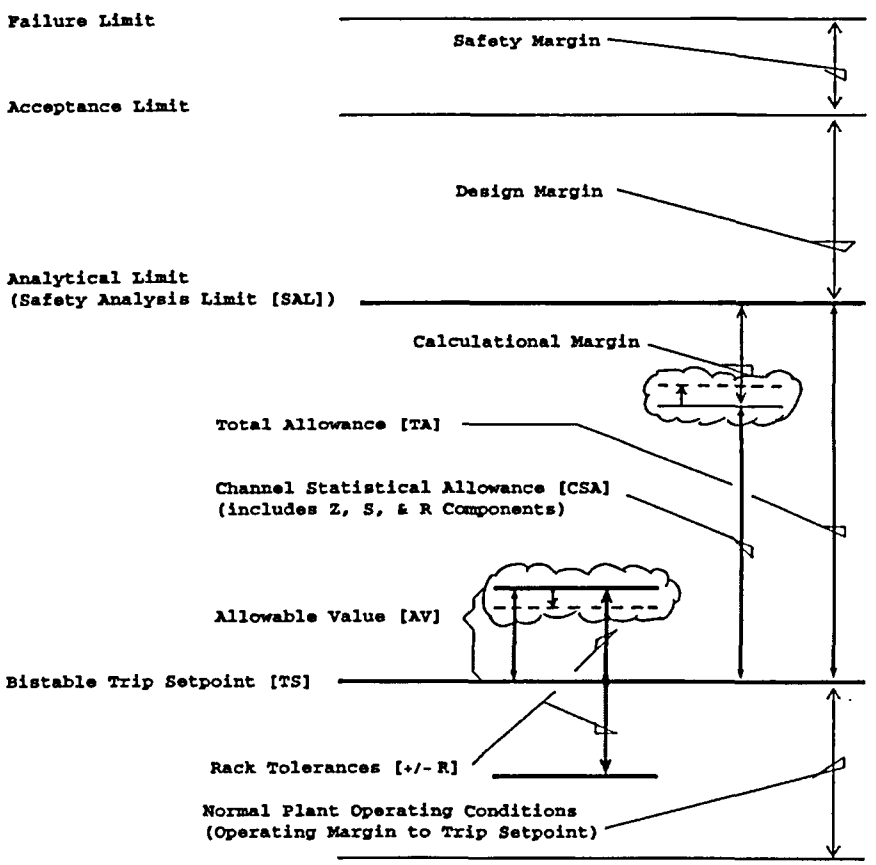
Technical Analysis (continued)

For clarity, Figure 2 below provides a simplified graphical representation (clouded areas) of the increases in the statistical summation error term "Z," which slightly reduces the calculation margin, and the effective decrease in the allowable value for one of the SGWL trip setpoints.

CALCULATION NO. HNP-I/INST-1010
PAGE 15
REV. 0

FIGURE 2

OPERATING CONDITIONS, UNCERTAINTIES, AND MARGINS RELATIVE TO SAFETY ANALYSIS LIMIT, ALLOWABLE VALUE, AND TRIP SETPOINT



Note: Figure is intended to provide relative position and not to imply direction.

(Adapted from ISA S67.04-1994, Figure 1)

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
DESCRIPTION, BACKGROUND, AND TECHNICAL ANALYSIS

Technical Analysis (continued)

Conclusion

HNP 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
10 CFR 50.92 NO SIGNFICANT HAZARDS EVALUATION.

10 CFR 50.92 NO SIGNIFICANT HAZARDS EVALUATION

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
10 CFR 50.92 NO SIGNFICANT HAZARDS EVALUATION.

A written evaluation of the significant hazards consideration of a proposed license amendment is required by 10 CFR 50.92. Harris Nuclear Plant (HNP) has evaluated the proposed amendment and determined that it involves no significant hazards consideration. According to 10 CFR 50.92, a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3. Involve a significant reduction in a margin of safety

The basis for this determination is presented below.

Proposed Change

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, "Application for amendment of license or construction permit," Carolina Power and Light Company (CP&L) doing business as Progress Energy Carolinas, Inc., requests a license amendment for the Harris Nuclear Plant (HNP) Technical Specifications (TS). The proposed amendment will modify the statistical summation error term "z" and the allowable value for certain steam generator water level (SGWL) trip setpoints used in the Reactor Trip System (RTS) and Engineered Safety Feature Actuation System (ESFAS) instrumentation, but it does not change any trip setpoints described in the TS. The proposed amendment is necessary to address recent generic issues involving SGWL measurement uncertainty considerations associated with Westinghouse-designed steam generators.

HNP proposes to revise TS Section 2.2.1 (Table 2.2-1, Items 13 & 14) and Section 3/4.3.2 (Table 3.3-4, Items 5.b & 6.c) to reflect: 1) increases in the statistical summation error term "Z" for SGWL Low-Low RTS trip setpoint, SGWL Low Coincident with Steam/Feedwater (FW) Flow Mismatch RTS trip setpoint, SGWL High-High Turbine Trip and FW Isolation ESFAS trip setpoint, and SGWL Low-Low Auxiliary Feedwater (AFW) Actuation ESFAS trip setpoint; and 2) an effective decrease in the allowable value (AV) for the SGWL Low Coincident with Steam/FW Flow Mismatch RTS trip setpoint. For clarity, the existing (old) and proposed (new) values are detailed in the table below.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
10 CFR 50.92 NO SIGNFICANT HAZARDS EVALUATION.

Proposed Change (continued)

RTS/ESFAS Trip Setpoint	Z Term		Allowable Value	
	Old	New	Old	New
SGWL Low-Low RTS Trip Setpoint (≥25%) Table 2.2-1, Item 13	16.85%	**17.45%**	≥23.5%	No Change
SGWL Low Coincident with Steam/FW Flow Mismatch RTS Trip Setpoint (≥25%) Table 2.2-1, Item 14	5.35%	**5.95%**	≥23.5%	**≥24.05%**
SGWL High-High (P-14) Turbine Trip & FW Isolation ESFAS Trip Setpoint (≤78.0%) Table 3.3-4, Item 5.b	8.05%	**8.15%**	≤79.5%	No Change
SGWL Low-Low Aux FW Actuation ESFAS Trip Setpoint (≥25%) Table 3.3-4, Item 6.c	16.85%	**17.45%**	≥23.5%	No Change

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
10 CFR 50.92 NO SIGNFICANT HAZARDS EVALUATION.

Basis

This amendment does not involve a significant hazards consideration for the following reasons:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed change to revise the statistical summation error term "Z" and one of the allowable values for certain steam generator water level (SGWL) reactor protection and engineered safety feature actuation functions continues to follow the current setpoint methodology previously approved for HNP while addressing newly identified level uncertainty considerations. The proposed change does not alter the installed plant configuration for the affected instrumentation or the associated equipment system interfaces. The proposed change continues to maintain the assumptions for the specified instrument loops used in the Final Safety Analysis Report (FSAR) for HNP, and the channel statistical allowances (CSA) or calculated total loop uncertainties remain bounded by the total allowance (TA) values presented in the HNP Technical Specifications (TS). The proposed change does not alter the accident analyses or the causes for any accident described in the FSAR that credit the SGWL setpoint actuations. The proposed amendment will not modify, degrade, prevent actions or alter any assumptions previously made in evaluating the radiological consequences of an accident described in the FSAR.

   Therefore, this amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
10 CFR 50.92 NO SIGNFICANT HAZARDS EVALUATION.

Basis (Continued)

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change to revise the statistical summation error term "Z" and one of the allowable values for certain SGWL reactor protection and engineered safety feature actuation functions addresses newly identified level uncertainty considerations. The proposed change does not implement any physical changes to the systems, structures, or components for the affected instrumentation loops or to the associated equipment system interfaces. No new or different accident initiators or sequences are created by the proposed change. The proposed change continues to maintain the safety analysis limits used in the safety analyses that credit the specified actuation functions.

   Therefore, this amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
10 CFR 50.92 NO SIGNFICANT HAZARDS EVALUATION.

Basis (Continued)

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No.

   The proposed change to revise the statistical summation error term "Z" and one of the allowable values for certain SGWL reactor protection and engineered safety feature actuation functions addresses newly identified level uncertainty considerations and does not involve a reduction in the margin of safety for plant operation. Consistent with the requirements of the HNP FSAR, the proposed change has been evaluated to ensure that the assumptions for the specified instrument loops used in the FSAR continue to be maintained and that the CSA or calculated total loop uncertainties remain bounded by the TA values presented in the HNP TS. The proposed change continues to follow the current setpoint methodology previously approved for HNP, and the revised uncertainty analysis results in acceptable calculational margin.

   Therefore, this amendment does not involve a significant reduction in a margin of safety.

Based on the above, HNP concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
PROPOSED TECHNICAL SPECIFICATIONS (TS) CHANGES

PROPOSED TECHNICAL SPECIFICATIONS (TS) CHANGES

TABLE 2.2-1 (continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (S)	TRIP SETPOINT	ALLOWABLE VALUE
12. Reactor Coolant Flow-Low	4.58	1.98	0.6	≥ 90.5% of loop full indicated flow	≥ 89.5% of loop full indicated flow (1)
13. Steam Generator Water Level Low-Low	25.0	~~16.85~~ 5.95	2.0	≥ 25.0% of narrow range instrument span	≥ 23.5% of narrow range instrument span |
14. Steam Generator Water Level - Low Coincident With Steam/Feedwater Flow Mismatch	8.9	~~5.35~~	2.0	≥ 25.0% of narrow range instrument span	~~≥ 23.5%~~ of narrow range instrument span |
	20.0	3.01	Note 6	≤ 40% of full steam flow at RTP**	≤ 43.1% of full steam flow at RTP** (1)
15. Undervoltage - Reactor Coolant Pumps	14.0	1.3	0.0	≥ 5148 volts	≥ 4920 volts
16. Underfrequency - Reactor Coolant Pumps	5.0	3.0	0.0	≥ 57.5 Hz	≥ 57.3 Hz
17. Turbine Trip					
a. Low Fluid Oil Pressure	N.A.	N.A.	N.A.	≥ 1000 psig	≥ 950 psig
b. Turbine Throttle Valve Closure	N.A.	N.A.	N.A.	≥ 1% open	≥ 1% open
18. Safety Injection Input from ESF	N.A.	N.A.	N.A.	N.A.	N.A.

**RTP = RATED THERMAL POWER

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (S)	TRIP SETPOINT	ALLOWABLE VALUE
5. Turbine Trip and Feedwater Isolation (Continued)					
b. Steam Generator Water Level--High-High (P-14)	22.0 ~~8.05~~ 8.15 REVISE		2.0	≤ 78.0% of narrow range instrument span.	≤ 79.5% of narrow range instrument span.
c. Safety Injection	See Item 1. above for Safety Injection Trip Setpoints and Allowable Values.				
6. Auxiliary Feedwater					
a. Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
c. Steam Generator Water Level--Low-Low	25.0 17.45 REVISE ~~16.85~~		2.0	≥ 25.0% of narrow range instrument span.	≥ 23.5% of narrow range instrument span.
d. Safety Injection Start Motor-Driven Pumps	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				
e. Loss-of-Offsite Power Start Motor-Driven Pumps and Turbine-Driven Pump	See Item 9. below for all Loss-of-Offsite Trip Setpoint and Allowable Values.				
f. Trip of All Main Feedwater Pumps Start Motor-Driven Pumps	N.A.	N.A.	N.A.	N.A.	N.A.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
REVISED TECHNICAL SPECIFICATION (TS) PAGES

REVISED TECHNICAL SPECIFICATIONS (TS) PAGES

TABLE 2.2-1 (continued)

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (S)	TRIP SETPOINT	ALLOWABLE VALUE
12. Reactor Coolant Flow-Low	4.58	1.98	0.6	≥ 90.5% of loop full indicated flow	≥ 89.5% of loop full indicated flow
13. Steam Generator Water Level Low-Low	25.0	17.45	2.0	≥ 25.0% of narrow range instrument span	≥ 23.5% of narrow range instrument span
14. Steam Generator Water Level - Low Coincident With Steam/Feedwater Flow Mismatch	8.9 20.0	5.95 3.01	2.0 Note 6	≥ 25.0% of narrow range instrument span ≤ 40% of full steam flow at RTP**	≥ 24.05% of narrow range instrument span ≤ 43.1% of full steam flow at RTP**
15. Undervoltage - Reactor Coolant Pumps	14.0	1.3	0.0	≥ 5148 volts	≥ 4920 volts
16. Underfrequency - Reactor Coolant Pumps	5.0	3.0	0.0	≥ 57.5 Hz	≥ 57.3 Hz
17. Turbine Trip					
a. Low Fluid Oil Pressure	N.A.	N.A.	N.A.	≥ 1000 psig	≥ 950 psig
b. Turbine Throttle Valve Closure	N.A.	N.A.	N.A.	≥ 1% open	≥ 1% open
18. Safety Injection Input from ESF	N.A.	N.A.	N.A.	N.A.	N.A.

**RTP = RATED THERMAL POWER

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR ERROR (S)	TRIP SETPOINT	ALLOWABLE VALUE
5. Turbine Trip and Feedwater Isolation (Continued)					
b. Steam Generator Water Level--High-High (P-14)	22.0	8.15	2.0	≤ 78.0% of narrow range instrument span.	≤ 79.5% of narrow range instrument span.
c. Safety Injection	See Item 1. above for Safety Injection Trip Setpoints and Allowable Values.				
6. Auxiliary Feedwater					
a. Manual Initiation	N.A.	N.A.	N.A.	N.A.	N.A.
b. Automatic Actuation Logic and Actuation Relays	N.A.	N.A.	N.A.	N.A.	N.A.
c. Steam Generator Water Level--Low-Low	25.0	17.45	2.0	≥ 25.0% of narrow range instrument span.	≥ 23.5% of narrow range instrument span.
d. Safety Injection Start Motor-Driven Pumps	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				
e. Loss-of-Offsite Power Start Motor-Driven Pumps and Turbine-Driven Pump	See Item 9. below for all Loss-of-Offsite Trip Setpoint and Allowable Values.				
f. Trip of All Main Feedwater Pumps Start Motor-Driven Pumps	N.A.	N.A.	N.A.	N.A.	N.A.