



Progress Energy

MAY 5 2011

SERIAL: HNP-11-053
10 CFR 50.71(e)

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

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/RENEWED LICENSE NO. NPF-63
TRANSMITTAL OF TECHNICAL SPECIFICATIONS BASES REVISIONS

Ladies and Gentlemen:

In accordance with Technical Specification 6.8.4.n and 10 CFR 50.71(e), Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., submits the attached Technical Specification Bases revisions for the Harris Nuclear Plant (HNP) since November 10, 2009.

Attachment A provides the HNP Technical Specifications List of Effective Pages. Attachment B provides the replacement pages for the HNP Technical Specifications Bases.

This letter contains no new regulatory commitments.

Please contact me if you have any questions regarding this submittal at (919) 362-3137.

Sincerely,

D. H. Corlett
Supervisor, Licensing/Regulatory Programs
Harris Nuclear Plant

DHC/jmd

Attachments:

- A. HNP Technical Specifications List of Effective Pages
- B. Replacement HNP Technical Specifications Bases Pages

cc: Mr. J. D. Austin, NRC Sr. Resident Inspector, HNP
Mrs. B. L. Mozafari, NRC Project Manager, HNP
Mr. V. M. McCree, NRC Regional Administrator, Region II

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

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PROGRESS ENERGY CAROLINAS, INC.
SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NUMBER 50-400/RENEWED LICENSE NUMBER NPF-63

ATTACHMENT A

HNP TECHNICAL SPECIFICATIONS BASES LIST OF EFFECTIVE PAGES

15 PAGES TOTAL

LIST OF EFFECTIVE PAGES
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UNIT ONE
TECHNICAL SPECIFICATIONS (NPF-63)
APPENDIX A TO FACILITY OPERATION LICENSE

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PROGRESS ENERGY CAROLINAS, INC.
SHEARON HARRIS NUCLEAR POWER PLANT UNIT 1
DOCKET NUMBER 50-400/RENEWED LICENSE NUMBER NPF-63

ATTACHMENT B

REPLACEMENT PAGES FOR THE HNP TECHNICAL SPECIFICATIONS BASES

5 PAGES TOTAL

REACTIVITY CONTROL SYSTEMS

BASES

BORATION SYSTEMS (Continued)

condition of the reactor and the additional restrictions prohibiting CORE ALTERATIONS and positive reactivity changes in the event the single boron injection flow path becomes inoperable.

The limitation for a maximum of one charging/safety injection pump (CSIP) to be OPERABLE and the Surveillance Requirement to verify all CSIPs except the required OPERABLE pump to be inoperable below 325°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

The boron capability required below 200°F is sufficient to provide the required SHUTDOWN MARGIN as defined by Specification 3/4.1.1.2 after xenon decay and cooldown from 200°F to 140°F. This condition requires either 7150 gallons of 7000 ppm borated water be maintained in the boric acid storage tanks or 106,000 gallons of 2400-2600 ppm borated water be maintained in the RWST.

The gallons given above are the amounts that need to be maintained in the tank in the various circumstances. To get the specified indicated levels used for surveillance testing, each value had added to it an allowance for the unusable volume of water in the tank, allowances for other identified needs, and an allowance for possible instrument error. In addition, for human factors purposes, the percent indicated levels were then raised to either the next whole percent or the next even percent and the gallon figures rounded off. This makes the LCO values conservative to the analyzed values.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.0 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

The BAT minimum temperature of 65°F ensures that boron solubility is maintained for concentrations of at least the 7750 ppm limit. The RWST minimum temperature is consistent with the STS value and is based upon other considerations since solubility is not an issue at the specified concentration levels. The RWST high temperature was selected to be consistent with analytical assumptions for containment heat load.

The OPERABILITY of one Boron Injection System during REFUELING ensures that this system is available for reactivity control while in MODE 6.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that: (1) acceptable power distribution limits are maintained, (2) the minimum SHUTDOWN MARGIN is maintained, and (3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the control rod position indicators is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

POWER DISTRIBUTION LIMITS

BASES

HEAT FLUX HOT CHANNEL FACTOR AND NUCLEAR ENTHALPY RISE HOT CHANNEL FACTOR (Continued)

Limit on the hot channel factor, $F_Q(Z)$, is met. $V(Z)$ accounts for the effects of normal operation transients and was determined from expected power control maneuvers over the full range of burnup conditions in the core. The $V(Z)$ function is specified in the COLR.

$F_Q^M(Z)$ evaluations are not applicable for the following axial core regions, measured in percent of core height:

1. Lower core region from 0 to 15%, inclusive.
2. Upper core region from 85 to 100%, inclusive.

The top and bottom 15% of the core are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analyses and because of the difficulty of making a precise measurement in these regions.

INSTRUMENTATION

BASES

REMOTE SHUTDOWN SYSTEM (Continued)

This capability is consistent with General Design Criterion 3, 10 CFR 50.48(a) and 10 CFR 50.48(c).

3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION

The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, Revision 3, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant Conditions During and Following an Accident," May 1983 and NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980. The RVLIS and In Core Thermocouple design meets the intent of Regulatory Guide 1.97. The HNP design (and Regulatory Guide 1.97) stipulates redundancy for RVLIS and In Core Thermocouples. A fully 100% functional channel would be available should a channel fail.

The RVLIS and In Core Thermocouple systems do not automatically actuate any component. These monitoring systems are used for indication only. Diverse monitoring is available for core cooling indication requirements such as Reactor Coolant Hot and Cold Leg temperature indications as well as Reactor Coolant System pressure.

The thirty-day completion time for one inoperable channel of RVLIS or In Core Thermocouples is based on operating experience and takes into account the remaining OPERABLE channel, the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring an instrument during this interval. If the thirty-day completion time was not met, then a written report to the NRC would be required to outline the preplanned alternate method of monitoring (in this case the other redundant channel would be available), the cause of the inoperability, and plans and a schedule for restoring the instrumentation channels of the Function to operable status.

If both channels of RVLIS or In Core Thermocouples are inoperable, then restore an inoperable channel within 7 days. The completion time of 7 days is based on the relatively low probability of an event requiring RVLIS and In Core Thermocouple instrumentation operation and the availability of alternate means to obtain the required information. Diverse monitoring is available for core cooling indication requirements such as Reactor Coolant Hot and Cold Leg temperature indications as well as Reactor Coolant System pressure. These parameters can be used to manually determine subcooling margin, which normally uses core exit temperatures.

3/4.3.3.7 DELETED

3/4.3.3.8 DELETED

3/4.3.3.9 DELETED

3/4.3.3.10 DELETED

BASES

ECCS SUBSYSTEMS (Continued)

The Surveillance Requirements provided to ensure OPERABILITY of each component ensures that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance Requirements for throttle valve position and flow balance testing provide assurance that proper ECCS flows will be maintained in the event of a LOCA. Maintenance of proper flow resistance and pressure drop in the piping system to each injection point is necessary to: (1) prevent total pump flow from exceeding runout conditions when the system is in its minimum resistance configuration, (2) provide the proper flow split between injection points in accordance with the assumptions used in the ECCS-LOCA analyses, and (3) provide an acceptable level of total ECCS flow to all injection points equal to or above that assumed in the ECCS-LOCA analyses.

3/4.5.4 REFUELING WATER STORAGE TANK

The OPERABILITY of the refueling water storage tank (RWST) as part of the ECCS ensures that a sufficient supply of borated water is available for injection into the core by the ECCS. This borated water is used as cooling water for the core in the event of a LOCA and provides sufficient negative reactivity to adequately counteract any positive increase in reactivity caused by RCS cooldown. RCS cooldown can be caused by inadvertent depressurization, a LOCA, or a steam line rupture.

The limits on RWST minimum volume and boron concentration assure that: (1) sufficient water is available within containment to permit recirculation cooling flow to the core and (2) the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes with all shutdown and control rods inserted except for the most reactive control assembly. These limits are consistent with the assumption of the LOCA and steam line break analyses.

The contained water volume limit includes an allowance for water not usable because of tank discharge line location or other physical characteristics.

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.0 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

An RWST allowed outage time of 12 hours is permitted during performance of Technical Specification surveillance 4.4.6.2.2 with a dedicated attendant stationed at valve ICT-22 in communication with the Control Room. The dedicated attendant is to remain within the RWST compartment whenever valve ICT-22 is open during the surveillance. The dedicated attendant can manually close valve ICT-22 within 30 minutes in case of a line break caused by a seismic event. Due to the piping configuration, a break in the non-seismic portion of piping during this surveillance could result in draining the RWST below the minimum analyzed volume.

CONTAINMENT SYSTEMS

BASES

CONTAINMENT VENTILATION SYSTEM (Continued)

gross leakage failures could develop. The 0.60 L_a leakage limit of Specification 3.6.1.2b. shall not be exceeded when the leakage rates determined by the leakage integrity tests of these valves are added to the previously determined total for all valves and penetrations subject to Type B and C tests.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

3/4.6.2.1 CONTAINMENT SPRAY SYSTEM

The OPERABILITY of the Containment Spray System ensures that containment depressurization and cooling capability will be available in the event of a LOCA or steam line break. The pressure reduction and resultant lower containment leakage rate are consistent with the assumptions used in the safety analyses.

The Containment Spray System and the Containment Fan Coolers are redundant to each other in providing post-accident cooling of the containment atmosphere. However, the Containment Spray System also provides a mechanism for removing iodine from the containment atmosphere and therefore the time requirements for restoring an inoperable spray system to OPERABLE status have been maintained consistent with that assigned other inoperable ESF equipment.

3/4.6.2.2 SPRAY ADDITIVE SYSTEM

The OPERABILITY of the Spray Additive System ensures that sufficient NaOH is added to the containment spray in the event of a LOCA. The limits on NaOH volume and concentration ensure a pH value of between 7.0 and 11.0 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components. The contained solution volume limit includes an allowance for solution not usable because of tank discharge line location or other physical characteristics. These assumptions are consistent with the iodine removal efficiency assumed in the safety analyses.

The maximum and minimum volumes for the Spray Additive Tank are based on the analytical limits. The specified indicated levels used for surveillance include instrument uncertainties and unusable tank volume.

3/4.6.2.3 CONTAINMENT COOLING SYSTEM

The OPERABILITY of the Containment Fan Coolers ensures that adequate heat removal capacity is available when operated in conjunction with the Containment Spray Systems during post-LOCA conditions.

ESW flowrate to the Containment Fan Coolers will vary based on reservoir level. Acceptable ESW flowrate is dependent on the number of heat exchanger tubes in service. Surveillance test acceptance criteria should be adjusted for these factors.