Progress Energy

OCT 2 4 2006

Serial: HNP-06-126
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
RESPONSE TO THE REQUEST FOR ADDITIONAL INFORMATION (RAI)
REGARDING THE LICENSE AMENDMENT REQUEST APPLICATION FOR
TECHNICAL SPECIFICATION IMPROVEMENT REGARDING STEAM
GENERATOR TUBE INTEGRITY

Ladies and Gentlemen:

On October 6, 2006, the NRC requested additional information to facilitate the review of the proposed request (HNP-06-060) dated May 23, 2006, as supplemented by letter (HNP-06-116) dated October 3, 2006, for a license amendment to the Technical Specifications (TS) of the Harris Nuclear Plant (HNP). The proposed amendment would revise the TS requirements related to steam generator tube integrity consistent with NRC-approved Revision 4 to Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity."

Attachment 1 provides the response to the RAI.

Attachment 2 provides the proposed TS Bases changes discussed in the response to the RAI (for information only).

The proposed response provided by this submittal involves certain changes to the TS Bases only, which does not change the intent or the justification for the requested amendment. Therefore, the No Significant Hazards Consideration Evaluation (10 CFR 50.92) provided in the May 23, 2006 HNP letter remains valid.

HNP requests that the proposed amendment be issued prior to May 31, 2007, with the amendment being implemented within 90 days, as originally requested.

In addition, this document contains no new or revised Regulatory Commitments.

Progress Energy Carolinas, Inc.
Harris Nuclear Plant
P. O. Box 165
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Please refer any question regarding this submittal to me at (919) 362-3137.

Sincerely,

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

DHC/jpy

Attachments:

1. Response to the Request for Additional Information (RAI) Regarding the License Amendment Request Application for Technical Specification Improvement Regarding Steam Generator Tube Integrity
2. Proposed Technical Specification (TS) Bases Changes (For Information Only)

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

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Request 1:

On page 2 of 7 in the Bases Insert 3/4.4.6.2, in the first paragraph under Applicable Safety Analyses, it states: "The HNP accident analyses assume the amount of primary to secondary steam generator tube leakage is 1 gpm." This statement is different than the TSTF in that the TSTF states, "or [the leakage] increases to 1gpm as a result of accident induced conditions." We are unclear as to why Harris deviated from the TSTF. The second half of this statement is simply indicating that leakage can increase as a result of an accident and that this leakage must be limited to the design basis assumption of 1 gpm. That is, they either implicitly or explicitly assume the leakage increases to 1 gpm. The issue is that if the statement does not include acknowledgment of an increase in leakage under accident conditions then the licensee could be operating near operational leakage limits and would exceed the accident leakage when the increase occurs.

Response 1:

Page 2 of 7 of Bases Insert 3/4 4.6.2 has been revised to include a statement acknowledging an increase in leakage under accident conditions to be more consistent with the TSTF, and this revised page has been included in the proposed TS Bases changes (Attachment 2) of this letter. Based on a review, the Harris Nuclear Plant (HNP) design basis does not explicitly contain the same wording used in the TSTF. However, the accident-induced leakage rate for HNP does include any additional increase in primary-to-secondary leakage induced during the accident, so including this statement is consistent with HNP design.

Request 2:

On page 5 of 7 in the Bases Insert 3/4.4.6.2, action statement b. is incomplete. This action statement should include a discussion of the shutdown requirements (Hot Standby in 6 hrs, Cold shutdown in 30 hrs).

Response 2:

Page 5 of 7 of Bases Insert 3/4.4.6.2 has been revised to include a discussion of the shutdown requirements, and this revised page has been included in the proposed TS Bases changes (Attachment 2) of this letter.

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Request 3:

On page 5 of 7 in the Bases Insert 3/4.4.6.2, action statement c. is missing. This action statement is present in the TS but is not included in the bases.

Response 3:

Page 5 of 7 of Bases Insert 3/4.4.6.2 has been revised to include a discussion of action statement c., and this revised page has been included in the proposed TS Bases changes (Attachment 2) of this letter. Pages 6 of 7 and 7 of 7 were impacted by this revision due to text rolling onto the next page, so for clarity, these pages have also been included in the proposed TS Bases changes (Attachment 2) of this letter.

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

PROPOSED TECHNICAL SPECIFICATIONS (TS) BASES CHANGES (FOR INFORMATION ONLY)

3/4.4.6.2 OPERATIONAL LEAKAGE (continued)

Applicable Safety Analyses

Except for primary-to-secondary leakage, the safety analyses do not address operational leakage. However, other operational leakage is related to the safety analyses for a LOCA; the amount of leakage can affect the probability of such an event. In some analyses developed by the industry, the steam discharge to the atmosphere is based on the total primary-to-secondary LEAKAGE from all SGs of 1 gallon per minute (gpm) or is assumed to increase to 1 gpm as a result of accident induced conditions. The HNP accident analyses assume the amount of primary-to-secondary steam generator tube leakage is 1 gpm. This 1 gpm leak rate includes the primary-to-secondary leakage rate existing immediately prior to the accident plus any additional increase in primary-to-secondary leakage induced during the accident. The LCO requirement to limit primary-to-secondary leakage through any one steam generator is limited to less than or equal to 150 gpd, which is significantly less than the conditions assumed in the safety analysis.

Primary-to-secondary leakage is a factor in the dose releases outside containment resulting from a steam line break (SLB) accident or a steam generator tube rupture (SGTR). The leakage contaminates the secondary fluid.

The FSAR analysis for a SGTR assumes the contaminated secondary fluid is released directly to the atmosphere due to a failure of the PORV in the open position and will continue atmospheric release until the time that the PORV can be isolated. The FSAR analysis for the SLB assumes that the SG with the failed steam line boils dry releasing all of the iodine directly to the environment and that iodine carried over to the faulted SG by tube leaks are also released directly to the environment until the RCS has cooled to below 212°F. The dose consequences resulting from the SGTR and the SLB accidents are within the limits defined in 10 CFR 50.67.

The RCS operational leakage satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

3/4.4.6.2 OPERATIONAL LEAKAGE (continued)

Applicability

In MODES 1, 2, 3, and 4, the potential for RCPB leakage is greatest when the RCS is pressurized.

In MODES 5 and 6, leakage limits are not required because the reactor coolant pressure is far lower, resulting in lower stresses and reduced potentials for leakage.

ACTIONS

a. If any PRESSURE BOUNDARY LEAKAGE exists, or primary-to-secondary leakage is not within limit, the reactor must be brought to HOT STANDBY within 6 hours and COLD SHUTDOWN within the next 30 hours. This action reduces the leakage and also reduces the factors that tend to degrade the pressure boundary.

   The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. In COLD SHUTDOWN, the pressure stresses acting on the RCPB are much lower, and further deterioration is much less likely.

b. UNIDENTIFIED LEAKAGE, IDENTIFIED LEAKAGE, or CONTROLLED LEAKAGE in excess of the LCO limits must be reduced to within the limits within 4 hours. This completion time allows time to verify leakage rates and either identify UNIDENTIFIED LEAKAGE or reduce leakage to within limits before the reactor must be shut down. Otherwise, the reactor must be brought to HOT STANDBY within 6 hours and COLD SHUTDOWN within the following 30 hours. This action is necessary to prevent further deterioration of the RCPB.

c. With RCS Pressure Isolation Valve leakage in excess of the limit, the high pressure portion of the affected system must be isolated within 4 hours, or be in at least HOT STANDBY within the next 6 hours, and COLD SHUTDOWN within the following 30 hours. This action is necessary to prevent over pressurization of low pressure systems, and the potential for intersystem LOCA.

3/4.4.6.2 OPERATIONAL LEAKAGE (continued)

Surveillance Requirements

4.4.6.2.1 Verifying RCS leakage to be within the LCO limits ensures the integrity of the RCPB is maintained. PRESSURE BOUNDARY LEAKAGE would at first appear as UNIDENTIFIED LEAKAGE and can only be positively identified by inspection. It should be noted that leakage past seals and gaskets is not PRESSURE BOUNDARY LEAKAGE. UNIDENTIFIED LEAKAGE and IDENTIFIED LEAKAGE are determined by performance of an RCS water inventory balance.

The RCS water inventory balance must be met with the reactor at steady-state operating conditions (stable pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The surveillance is modified by a note. The note states that this SR is not required to be performed until 12 hours after establishing steady-state operation. The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Steady-state operation is required to perform a proper water inventory balance since calculations during maneuvering are not useful. For RCS operational leakage determination by water inventory balance, steady-state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

An early warning of PRESSURE BOUNDARY LEAKAGE or UNIDENTIFIED LEAKAGE is provided by the automatic systems that monitor containment atmosphere radioactivity and reactor cavity sump level. It should be noted that leakage past seals and gaskets is not PRESSURE BOUNDARY LEAKAGE. These leakage detection systems are specified in LCO 3.4.6.1, "Reactor Coolant System Leakage Detection Systems."

Part (d) notes that this SR is not applicable to primary-to-secondary leakage. This is because leakage of 150 gallons per day cannot be measured accurately by an RCS water inventory balance.

The 72-hour frequency is a reasonable interval to trend leakage and recognizes the importance of early leakage detection in the prevention of accidents.

3/4.4.6.2 OPERATIONAL LEAKAGE (continued)

4.4.6.2.2 The Surveillance Requirements for RCS Pressure Isolation Valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA. Leakage from the RCS pressure isolation valve is IDENTIFIED LEAKAGE and will be considered as a portion of the allowed limit.

4.4.6.2.3 This SR verifies that primary-to-secondary leakage is less than or equal to 150 gpd through any one steam generator. Satisfying the primary-to-secondary leakage limit ensures that the operational leakage performance criterion in the Steam Generator Program is met. If this Surveillance Requirement is not met, compliance with LCO 3.4.5 should be evaluated. The 150-gpd limit is measured at room temperature as described in Reference 4. The operational leakage rate limit applies to leakage through any one steam generator. If it is not practical to assign the leakage to an individual steam generator, all the primary-to-secondary leakage should be conservatively assumed to be from one steam generator.

The surveillance is modified by a note, which states that the Surveillance is not required to be performed until 12 hours after establishment of steady-state operation. For RCS primary-to-secondary leakage determination, steady-state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

The frequency of 72 hours is a reasonable interval to trend primary-to-secondary leakage and recognizes the importance of early leakage detection in the prevention of accidents. The primary-to-secondary leakage is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Reference 4).

References

1. 10 CFR 50, Appendix A, GDC 30

2. Regulatory Guide 1.45, May 1973

3. NEI 97-06, “Steam Generator Program Guidelines”

4. EPRI, “Pressurized Water Reactor Primary-to-Secondary Leak Guidelines”