#16

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Date: 3/29/04 7:05PM
Subject: REQUEST FOR ADDITIONAL INFORMATION

Here is how we would respond to the questions that the staff currently has on the proposed TS change.

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SOUTH TEXAS PROJECT
UNITS 1 AND 2

50-498
50-499

PM: Michael Webb

#16

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REQUEST FOR ADDITIONAL INFORMATION
REGARDING PROPOSED AMENDMENT TO TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION 3/4.7.7
CONTROL ROOM MAKEUP AND CLEANUP FILTRATION SYSTEM

STP NUCLEAR OPERATING COMPANY
SOUTH TEXAS PROJECT UNITS 1 AND 2
DOCKET NO 50-498 AND 50-499

By letter dated March 18, 2004, STP Nuclear Operating Company (STPNOC) submitted a proposed amendment to the Technical Specifications (TSs) for the South Texas Project (STP) Units 1 and 2. The Nuclear Regulatory Commission (NRC) staff has reviewed the information the licensee provided that supports the proposed TS changes. In order for the staff to complete its evaluation, the following additional information is requested:

1. **The current licensing bases for the control room as described in the STP Technical Specifications and UFSAR states that the control room envelope is maintained at a minimum 0.125-inch positive water gauge with respect to adjacent areas. The proposed technical specification would allow positive pressure less than 0.125-inch water gauge with "appropriate compensatory measures." This proposed change represents a decrease in the pressure margin used to assure that unfiltered inleakage is minimized. In light that this decreased positive pressure condition may exist for approximately 18 months, there are no provisions to compensate for possible boundary degradation or variances in pressure conditions external to the control room boundary. The staff believes that compensatory measures are necessary to offset this decreased margin.**

   Please specify and justify the "appropriate compensatory measures" to be taken to offset this decrease in the pressure margin (for example, increased surveillance frequency, potassium iodide and/or self-contained breathing apparatus (SCBA)). If potassium iodide and SCBA are deemed appropriate measures to insure that GDC 19 is maintained, Regulatory Position 2.7.3 of NRC Regulatory Guide, 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors provides a method for crediting these compensatory measures. If Regulatory Guide 1.196 is used please verify if these provisions are met. The staff believes that inclusion of these compensatory measures in the bases is necessary to provide reasonable assurance that these compensatory measures are "appropriate."

   STPNOC Response:

   The proposed technical specification change will allow STPNOC to operate under a degraded condition where the control room in not maintained at least 1/8 inches water guage (inwg) positive relative to adjacent areas. STPNOC will implement increased testing to provide assurance against further degradation of the boundary and variances in pressure conditions external to the control room boundary.

1. Within 60 days of approval of the proposed Technical Specification change and on a quarterly frequency thereafter, each train combination (e.g., A-B, B-C, or A-C) will be tested on a staggered test basis in the pressurization and recirculation cleanup mode of operation (i.e., the emergency mode).

2. If all test points for a train combination are greater than or equal to 1/8 in wg positive pressure relative to adjacent areas, that train combination will be removed from the increased testing.

During the period where increased testing is required because some test points are positive but are not greater than or equal to 1/8 in wg positive pressure relative to adjacent areas, the following personnel protective compensatory measures will be in place.

1. For degraded conditions across walls with sealed penetrations where the likelihood of any inleakage condition resulting from changing conditions between testing would be minimal (i.e., a few cfm), potassium iodide (KI) tablets will be credited as the compensatory measure.

2. For degraded conditions across doors where seals have the potential for degradation and the inleakage condition resulting from changing conditions between testing would likely be more than minimal, self-contained breathing apparatus (SCBA) will be credited as the compensatory measure.

In both cases, crediting the compensatory action will only be required until the surveillance demonstrates that the differential pressure is greater than or equal to 1/8 in wg. Conditions with positive differential pressure, but less than 1/8 in-wg will be addressed in the Corrective Action Program.

The personnel protective measures of KI and SCBAs are deemed appropriate measures to insure that GDC 19 is maintained. The provisions of Regulatory Position 2.7.3 of NRC Regulatory Guide, 1.196 will be met.

The compensatory action will be incorporated into the Bases for TS 3.7.7 as shown in Attachment 2.

Justification for compensatory measures

Surveillance testing history demonstrates that control room pressure relative to adjacent areas does not significantly vary during 18-month surveillance intervals. Increased testing further compensates for the degraded differential pressure conditions across the control room boundary to provide assurance that further degradation would be detected in a timely manner.

The 1/8 in wg relative pressure has provided adequate margin over an 18-month surveillance interval to compensate for possible boundary degradation or variances in pressure conditions external to the control room boundary. Therefore, the worst case condition from a degraded condition where the control room last tested slightly positive relative to surrounding areas is a degradation where the adjacent area is nearly 1/8 in wg positive relative to the control room. For areas such as walls where penetrations are sealed, any inleakage into the control room is expected to only be a few cfm. For areas that contain doors where the seals have the potential for degradation, the inleakage is expected to be greater than a few cfm.

STP conducted calculations to determine thyroid dose at various levels of inleakage. The estimated results are:

Unfiltered inleakage	Estimated Radiological thyroid dose
30 cfm	30 rem
710 cfm	30 rem *

* Credit taken for use of KI tablets using a personnel protection factor of 10

Therefore, for degraded conditions such as walls with sealed penetrations, KI tablets provide reasonable personnel protective measures to demonstrate adequate margin for conditions where the worst case inleakage is expected to only be few cfm.

Managing boundaries differently provides flexibility to correct different degrees of degraded conditions. For most boundaries, SCBAs is not a compensatory measure that is needed to ensure GDC 19 is met. Although SCBAs are an adequate compensatory measure for limiting operator dose, they present an increased challenge to the operator. The increased test frequency and personnel protective measures described above provides reasonable management of degraded control room conditions so that the operators only need to take personnel protective commensurate with the condition.

2. **With these compensatory measures available for use in case of an accident provide an estimate of the maximum unfiltered inleakage allowable to meet GDC 19.**

STPNOC Response:

Estimate of the maximum unfiltered inleakage allowable to meet GDC 19 with compensatory measures is described in response to item #1. These estimates were calculated for a Loss of Coolant Accident, which is the limiting accident at STPNOC. The calculations also demonstrate that the 30 rem beta skin dose limits are not exceeded. The calculations were performed using the STP TRACI models.

3. **Provide the measurement uncertainty of the measurements made for Surveillance Requirement 4.7.7.e.3 and state whether this uncertainty is included in surveillance. If the uncertainty is not included justify exclusion of the uncertainty.**

STPNOC Response:

Differential pressure is measured in all areas with one exception using a NUCON digital pressure detector with an accuracy of ± 0.02 in wg. The test methodology is to measure the pressure on each side of the control room boundary with the same instrument for each area within in a few minutes so that the instrument accuracy does not affect the differential pressure value.

For the one exception, the differential pressure is measured with a combination inclined/vertical manometer with an accuracy of ± 0.02 in wg. The uncertainty of this one measurement is not included in the surveillance measured point.

4. **State whether the most limiting points measured for the Component Test will be included in future 4.7.7e.3 surveillance tests. If these limiting points will be excluded justify the exclusion of these points.**

STPNOC Response:

The limiting points for the Component Test will be included in the increased testing program described in the response to Question 1. STPNOC expects to make air balance improvements to the control room envelope so that all measured points will be greater than or equal 1/8 in wg relative to adjacent areas. If these improvements result in providing assurance that some measured points would not become limiting, then STPNOC may revise the scope of the surveillance. Justification of any change with respect to the surveillance points is required by the surveillance procedure revision process.

5. Provide a justification that the current degraded condition does not invalidate your hazardous chemical assessments.

STPNOC Response:

STPNOC's hazardous chemical analyses demonstrate that neither onsite or offsite hazardous chemical sources within the vicinity of the control room would reach toxicity limits inside the CRE within six minutes following nasal detection by operators. This meets the NRC Regulatory Guide 1.78 requirement that states operators should be able don breathing apparatus within two minutes. The hazardous chemicals are assumed to enter the control room environment via the normal control room ventilation flow path at a rate of 4000 cfm. No credit is taken for isolation of the ventilation system although manual isolation remains available to the operators for defense in depth. The normal ventilation flow exceeds any unfiltered inleakage with the ventilation system in the isolation mode. Therefore, unfiltered inleakage in this mode is not measured and is not incorporated into STPNOC's hazardous chemical assessment.

Since the function of the control room pressurization system is not to mitigate against hazardous chemical sources, the degradation of the 1/8 in wg differential margin does not impact STPNOC's hazardous chemical assessments.

Attachment 2

Bases Inserts

As stated in the original application, the information below will be included in the TS Bases for TS 3/4.7.7 Control Room Makeup And Cleanup Filtration System. The information in bold face has been added as noted in the response to Question 1 of the RAI.

Surveillance Requirement 4.7.7.e.3 verifies the integrity of the control room enclosure, and the assumed inleakage rates of the potentially contaminated air. The control room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify proper functioning of the Control Room HVAC. During the emergency mode of operation, the Control Room HVAC is designed to pressurize the control room to at least 1/8 inch water gauge (in wg) positive pressure with respect to adjacent areas in order to prevent unfiltered inleakage. The Control Room HVAC is designed to maintain this positive pressure with two trains at a makeup flow rate of 2000 cfm. The frequency of 18 months is consistent with the guidance provided in NUREG-0800. If the surveillance results are less than 1/8 in wg and the pressure differential is not positive, the surveillance requirement is considered not met and the appropriate action of TS 3.7.7 must be applied.

The surveillance includes a footnote allowing an evaluation of conditions where the differential pressure is positive but less than 1/8 inch wg. Although not meeting Technical Specification acceptance criteria, the positive relative pressure condition still assures that any leakage across this boundary location would be outleakage. Therefore, the functionality of the control room HVAC system is maintained with the degraded pressure condition within the envelope. The use of the footnote for a condition where the points are less than 1/8 inch wg is intended to be a temporary application until the points are restored to the design 1/8 inch wg in accordance with the corrective action program.

Compensatory actions may be applied based on the results of the evaluation provision of SR 4.7.7.e.3. The evaluation, including appropriate compensatory actions, must demonstrate that the dose limits of GDC 19 of Appendix A of 10CFR50 are met, including a 30 rem limit to the thyroid. If compensatory measures include self-contained breathing apparatus (SCBA) and potassium iodide (KI) tablets, then the requirements of Regulatory Position 2.7.3 of NRC Regulatory Guide, 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors" must be met.

STPNOC performs increased testing as a compensatory action to provide assurance against further degradation of the boundary and variances in pressure conditions external to the control room boundary.

1. **Within 60 days of approval of the proposed Technical Specification change that provided for compensatory action in SR 4.7.7.e.3., and on a quarterly frequency thereafter, each train combination (e.g., A-B, B-C, or**

A-C) will be tested on a staggered test basis in the pressurization and recirculation cleanup mode of operation (i.e., the emergency mode).

2. **If all test points for a train combination are greater than or equal to 1/8 in wg positive relative to adjacent areas, that train combination will be removed from the increased testing.**

During the period where increased testing is required because some test points are positive but are not greater than or equal to 1/8 in wg positive relative to adjacent areas, the following personnel protective compensatory measures will be in place.

1. **For degraded conditions across walls with sealed penetrations where the likelihood of any inleakage condition resulting from changing conditions between testing would be minimal (i.e., a few cfm), potassium iodide (KI) tablets will be credited as the compensatory measure.**

2. **For degraded conditions across doors where seals have the potential for degradation and the inleakage condition resulting from changing conditions between testing would likely be more than minimal, self-contained breathing apparatus (SCBA) will be credited as the compensatory measure.**

In both cases, crediting the compensatory action will only be required until the surveillance demonstrates that the differential pressure is greater than or equal to 1/8 in wg. Conditions with positive differential pressure, but less than 1/8 in-wg will be addressed in the Corrective Action Program.

The procedural infrastructure to apply the compensatory actions is in place. KI is available to the Control Room crews and SCBA units are staged and ready for use by Control Room personnel. STP's emergency plan implementing procedures require that personnel radiation exposure in the control room be monitored so that appropriate personnel protective measures will be taken by the operators during accident conditions.