April 13, 2006

Mr. James J. Sheppard
President and Chief Executive Officer
STP Nuclear Operating Company
South Texas Project Electric
Generating Station
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNIT 2 - RE: COMPLIANCE OF CONTROL ROOM HABITABILITY TO APPLICABLE REGULATORY REQUIREMENTS (TAC NO. MB9859)

Dear Mr. Sheppard:

In Generic Letter 2003-01 "Control Room Habitability" (GL-2003-01), the NRC staff states that, during the design of nuclear power plants, licensees performed analyses to demonstrate that the control room habitability systems (CRHSs), as designed, provide a habitable environment during postulated design basis events. These design analyses model the transport of potential contaminants into the control room envelope (CRE) and their removal. The amount of inleakage of assumed contaminants is important to these analyses, because unaccounted-for contaminants entering the CRE may impact the ability of the operators to perform plant control functions. If contaminants impair the response of the operators to an accident, there could be inadequate response to mitigate the impact of the accident consequences to the public health and safety.

Because of the importance of ensuring habitable control rooms under all normal and off-normal plant conditions, the addressees of GL-2003-01 were asked to provide confirmation that their facility's control room meets the applicable habitability regulatory requirements and that the CRHSs are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing bases. The NRC staff specifically requested the addressees to confirm that the most limiting unfiltered inleakage (and the filtered inleakage if applicable) into their facility's CRE was no more than the value assumed in their design basis radiological analyses for control room habitability and incorporated into their hazardous chemical assessment, and that reactor control could be maintained from either the control room or the alternate shutdown panel in the event of evolution of smoke. Licensees were also requested to describe how and when they performed the analyses, tests, and measurements for this confirmation.

In a letter dated August 5, 2004, South Texas Project Nuclear Operating Company (STPNOC) provided the results of an integrated tracer gas test conducted at South Texas Project (STP), Unit 1, during the week of March 8, 2004. To date, Unit 2 has not been tested. It is STPNOC's position that it is sufficient to test only the Unit 1 CRE, since inleakage of the Unit 2 CRE can be inferred from the results of the Unit 1 test because the two unit's CREs are identical in terms of design, materials, and construction. Therefore, because STPNOC asserts that the two reactors and their associated balance of plant designs are identical, STPNOC believes the two CRE's performances of inleakage would be identical.

It is the NRC staff's experience, that structures (i.e. CREs) that are designed and constructed of the same materials by the same company with similar components rarely demonstrate identical inleakage performance. This is especially true with respect to inleakages measured during tests. For example, potential sources of CRE inleakage include the walls, floors, ceilings, ductwork that passes through the envelope, intake and exhaust dampers and ductwork of the CRE ventilation system, fans, filter housing, instrument air lines, and electrical penetrations. CRE inleakage is a function of the differential pressure gradient across the boundary of the envelope, where inleakage results from respective penetrations in the envelope. In order for two CREs to have identical inleakage characteristics, each of the two CREs should demonstrate identical differential pressure gradients at similar locations across the penetrations in the two CREs. With different heat generation and removal rates within the CRE and areas adjacent to the CRE, it is unlikely that this can be demonstrated. In order to assure identical performance, the redundant equipment must also perform in an identical manner. Experience has shown that, typically, there is a significant variation in the inleakage performance of redundant trains of ventilation equipment. This was evident in the STPNOC testing performed on STP, Unit 1, as discussed next.

STPNOC's letter dated August 5, 2004, provided test results from tracer gas testing performed at STP, Unit 1, during the week of March 8, 2004. The design of the control room emergency ventilation systems for Units 1 and 2 is based on three 50 percent trains serving the same control room. The possible inleakage test result configurations for Unit 1 as reported are:

Trains A & B 9.4±50 cfm

Trains A & C -27±50 cfm

Trains B & C 1.9±25 cfm

Note that the three trains of the same system serving the same CRE do not have identical inleakage results. The NRC staff expects that, if three trains in a different CRE were tested, it is unlikely that the results would be similar to the results obtained for Unit 1 and, in fact, it would be more likely that the results would be different and could be greater than the results for Unit 1. There are numerous reasons why differences exist. Some differences are based upon the buildings of interest having different locations or different orientations. Some other differences are attributed to reactors' balance-of-plant designs exhibiting different performance characteristics.

A review of plants' technical specifications shows that it is not acceptable to rely upon the test results from one train when the design consists of redundant trains. The staff finds that both trains need to be tested. Consequently, it is reasonable that all CREs should be tested even if they are considered to be identical in construction.

Therefore, contrary to STPNOC's position, the NRC staff concludes that Unit 2 should be tracer gas tested to determine CRE inleakage. As discussed above, the staff's conclusion is based upon the results of the Unit 1 tests and the Unit 1 and Unit 2 differential pressure measurements, testing results from other CREs, and current technical specification requirements for redundant trains.

If you have any questions please contact the NRC Project Manager, Mohan Thadani at (301) 415-1476.

Sincerely,

/RA/ Cornelius Holden for

Catherine Haney, Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-499

cc: See next page

If you have any questions please contact the NRC Project Manager, Mohan Thadani at (301) 415-1476.

Sincerely,

/RA/ Cornelius Holden for

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Office of Nuclear Reactor Regulation

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