May 27, 2005

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 1 - RE: DISCUSSIONS CONCERNING FOREIGN OBJECTS FOUND IN STEAM GENERATORS

Dear Mr. Sheppard:

On March 31, 2005, the U.S Nuclear Regulatory Commission (NRC) staff, participated in a conference call with STP Nuclear Operating Company (STPNOC) regarding their 2005 steam generator tube inspection activities at South Texas Project, Unit 1, which included a discussion of the foreign objects removed from steam generators A, B and C, and ongoing efforts to remove foreign objects from steam generator D. A follow-up call was conducted with STPNOC on April 8, 2005. Attachment 1 is a summary of the conference calls. STPNOC provided the NRC staff with several documents to support the phone call. These documents were transmitted in e-mails sent on March 31, 2005, from John T. Conly, and April 4, 2005, from Steven Thomas, and are contained in Attachments 2 and 3, respectively.

The NRC staff has not identified any issues that require additional follow-up at this time.

Sincerely,

/RA/

David H. Jaffe, Senior Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-498

Attachments: As stated

cc: See next page

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ATTACHMENT 1

CONFERENCE CALL SUMMARY

2005 STEAM GENERATOR INSPECTIONS

SOUTH TEXAS PROJECT, UNIT 1

DOCKET NO. 50-498

On March 31, 2005, the NRC staff participated in a conference call with STP Nuclear Operating Company (STPNOC or the licensee) regarding the South Texas Project (STP), Unit 1, 2005 steam generator tube inspection activities, which included a discussion of the loose parts removed from steam generators A, B and C, and ongoing efforts to remove loose parts from steam generator D. A follow-up call was conducted with the STPNOC on April 8, 2005. A summary of the conference calls is provided below.

STP, Unit 1, has four recirculating steam generators designed and fabricated by Westinghouse. The model Delta 94 steam generators were put into service in 2000 during refueling outage 9 (RFO 9). Each steam generator has 7,585 thermally treated Alloy 690 tubes which have an outside diameter of 0.688-inch and a nominal wall thickness of 0.040-inch. The tubes were manufactured by Sandvik.

No primary or secondary inspections were performed during the last refueling outage (RFO 11). For the current refueling outage (RFO 13) sludge lancing and post lancing Foreign Object Search and Retrieval (FOSAR) was scheduled for all four steam generators. No primary side tube inspections were scheduled for RFO 13.

Video inspection of all four steam generators was conducted before and after sludge lancing. In steam generators A, B, and C several foreign objects (between 9 and 11 small objects per steam generator) were identified. These objects were stainless steel Flexitallic spiral wound gasket material. Of particular interest were several larger objects (approximately 2.5 to 3.5 inches long) that were identified in peripheral locations of the tube bundle. Video examination of the tubes in the vicinity of these objects revealed no wear indications. The licensee plans further video inspection of the tube bundle periphery to rule out tube wear and ensure that there are no more foreign objects present. All of the identified foreign objects in steam generators A, B, and C were removed except for one piece which was too fragile to be removed and crumbled when grasped by the robotic arm.

The specific source of the gasket material identified and removed from steam generators A, B, and C was not identified. The licensee believes that damage to the gaskets occurs during the installation process and degradation occurs soon after return to service. The introduction of gasket material is not believed to be an ongoing, age-related process. The licensee plans to replace any non-contained gaskets with a different style gasket that is not susceptible to this type of degradation.

The number of foreign objects identified in steam generator D are more extensive than the other three steam generators. Several hundred small wire fragments have been identified in steam generator D. The source of these wire fragments is believed to be a feedwater heater tube stabilizing cable. A single tube plug was discovered missing from the outlet side of feedwater heater 11A. The plug was recovered and the stabilizing cable from inside the tube was found wrapped around a valve cage. The stabilizing cable wrapped around a regulating valve and was damaged when the valve was manually closed during RFO 11. As a result of the damage caused to the stabilizing cable by the valve closure, a piece of the cable was severed and swept downstream in many small fragments. The missing piece of cable was approximately 13 inches in length and 7/16 inch in diameter.

Steam generator D is the only steam generator affected by the wire fragments. Fragments of the severed stabilizing cable were recovered from the steam generator D feedring spray cans and sludge collector. Video surveillance revealed that fragments of wire were able to pass through the feedring and enter steam generator D. The licensee performed sludge lancing procedures 7 times to remove the bulk of the wire fragments from within the tube bundle. After the sludge lancing procedures the licensee performed another video inspection of the tube bundle. At the time of the NRC staff's teleconference with the licensee approximately 2/3 of the tube bundle inspection was complete. The licensee identified approximately 90 pieces of wire that remained lodged in the tube bundle. Of the pieces identified, 21 had been retrieved by the licensee at the time of the call. Given the large number of wire fragments still lodged in the tube bundle, the licensee believes that it will not be possible to remove 100 percent of the foreign objects during this outage.

The post sludge lancing video inspection revealed one indication of tube wear near the top of the tubesheet on the hot leg side of the bundle. Based on industry guidance the licensee is required to perform primary side tube inspections because of the wear identified during secondary side visual inspections. The licensee will perform the following eddy current inspections:

1.) full length bobbin coil inspections on a 20% sample of tubes,
2.) full length bobbin coil inspections of 791 tubes in the center of the bundle (60 tube buffer zone),
3.) full length bobbin coil inspections of 435 tubes at the periphery of the bundle (plus an 87 tube buffer zone),
4.) +Point™ coil inspections of 100% of tubes with gap velocities >8.5 fps (at least two tubes into the tube bundle periphery),
5.) +Point™ coil inspections of 20% of tubes with gap velocities 7 - 8.5 fps, and
6.) +Point™ coil inspections of 702 special interest locations.

An inspection was also performed to assess the condition of the feedwater heaters which were the original source of the wire fragments. The licensee inspected all plugged tubes in the feedwater heaters and confirmed that no other plugs were missing or loose.

On April 8, 2005, the NRC staff participated in a follow-up call with the licensee to discuss any wire fragments that could not be removed from steam generator D. The licensee confirmed that Foreign Object Search and Retrieval (FOSAR) was performed to remove wire fragments from the tube bundle; however, not all of the fragments could be removed. The licensee performed analysis to show that wire fragments less than or equal to 3 inches in length would

not challenge tube integrity if left in the tube bundle. The licensee was unable to remove one wire fragment that was approximately 4 inches in length. The licensee determined that the larger piece of wire would not cause tube damage because it was not located near the bundle periphery. The periphery of the bundle experiences the highest flow velocity and is therefore the most susceptible location for wear caused by loose parts. The licensee's analysis employed conservative values for a range of fluid velocities and object sizes. Primary side eddy current testing revealed that only 1 tube experienced damage due to wear caused by a wire fragment. This tube was plugged and the associated wire fragment was removed. Based on the analysis performed and the results of the eddy current testing the licensee believes that tube integrity will be maintained during the next cycle of operation.

The NRC staff has not identified any issues that require additional follow-up at this time.

South Texas Project, Units 1 & 2

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