June 1, 2005

Mr. Joseph E. Venable
Vice President Operations
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 (WATERFORD 3) - REQUEST FOR ADDITIONAL INFORMATION RELATED TO REVIEW OF 12th REFUELING STEAM GENERATOR TUBE INSERVICE INSPECTION (TAC NO. MC5130)

Dear Mr. Venable:

By letters dated November 18, 2003 (ADAMS Accession No. ML033290432) and November 15, 2004 (ML043220259), Entergy Operations, Inc. (the licensee), submitted steam generator tube inspection summary reports for the Waterford 3 fall 2003 outage in accordance with the plant's Technical Specifications. In addition, information from your October 27, 2004, response to Generic Letter 2004-01 (ML043030322), "Requirements for Steam Generator Tube Inspections," was also used in the U. S. Nuclear Regulatory Commission (NRC) staff's review.

In order for the NRC staff to complete its review of these reports, it is determined that additional information is required. We request that you provide the responses to the attached Request for Additional Information. We discussed this information with your staff by telephone and they agreed to provide the additional information requested in the enclosure within 30 days of receipt of this letter.

If you have any questions, please call me at (301) 415-1480.

Sincerely,

/RA/

N. Kalyanam, Project Manager, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure: Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3 (WATERFORD 3)

FALL 2003 (RF12) STEAM GENERATOR (SG) INSERVICE INSPECTIONS

DOCKET NO. 50-382

Questions pertaining to the November 18, 2003, letter

1. Table 2.2 indicates that two indications in SG32 were attributed to wear greater than or equal to 39 percent through-wall. However, Attachment 2 in the November 15, 2004, letter lists three tubes with wall thickness penetrations of greater than or equal to 39 percent (SG32-R48-C18, SG32-R54-C88, and SG32-R56-C88). The latter two tubes were plugged.

   Clarify whether it was your intent to plug all tubes with wear indications greater than or equal to 39 percent through-wall. If so, discuss why tube SG32-R48-C18 was not plugged. Clarify why three tubes were not reflected in Table 2.2.

2. Table 3.1.2 describes a circumferential flaw with a through-wall depth of 99 percent at the top-of-tubesheet (TTS) in tube SG32-R75-C91. The indication exceeded the criteria for in-situ leakage testing under main steam line break pressure.

   a. Given the size of the flaw, discuss the results of previous inspections at this location (i.e., discuss whether the flaw was below the threshold of detection during the spring 2002 inspection).

   b. If a flaw signal was present during the previous inspection (based on hindsight analysis), discuss corrective actions taken to improve the detection of similar flaw signals.

   c. If a flaw signal was not present during the previous inspection (based on hindsight analysis), discuss whether the apparent growth rate is consistent with past experience, and discuss any implications regarding tube integrity.

3. Section 3.4 states that three freespan axial indications were found for the first time, and that lines of sludge were detected between the tube with the indications (tube SG31-R42-C140) and the stay rod. The +Point™ coil was used to identify the presence of three indications at the location of a distorted indication from the bobbin coil.

   a. Provide an estimate of the severity (i.e., length, depth) for the three axial cracks. Discuss the cracking mechanism (i.e., outside diameter stress corrosion cracking,

etc.), and clarify whether or not the three cracks were associated with the lines of sludge and/or dents/dings at this location.

b. Discuss the position of the cracks in relation to each other (e.g., discuss whether the cracks were axially aligned, or were offset in the circumferential direction). With regard to the relative position of the three cracks, discuss whether any of the three cracks could interact with one another (i.e., discuss whether the presence of one crack affects the burst pressure and/or leakage of another crack, or whether the ligaments between cracks are so small that two or more cracks behave as one larger crack).

4. In Section 3.6, it is stated that the +Point™ examination identified two flaw-like indications at dents in SG31, thereby resulting in expansion of the inspection to include "all dented intersections" on the hot leg side of SG31.

a. Clarify whether the +Point™ inspection expansion scope in SG31: (i) included all dented tubes at the eggcrate intersections, regardless of voltage, or merely all dents voltages greater than or equal to 2.0 volts; or (ii) was limited to tubes with new dents and/or dents greater than or equal to 2.0 volts and showed an increase in the voltage of 20 percent in RF12.

b. Provide the voltages for the dents that were associated with the two flaw indications. If the voltage for either of these two dents was near 2.0 volts, provide your basis for not expanding the scope of the +Point™ inspection to include dents with voltages less than 2.0 volts (assuming the scope was limited to dents greater than or equal to 2.0 volts). Discuss whether the two flaws were detected with a bobbin coil, and discuss the severity of these flaws.

c. Provide your basis for not expanding the inspection scope in SG32, since the potential for cracking of dented tubes at eggcrate intersections should be similar for both SGs.

5. It is stated on page one of the cover letter that the +Point™ coil was used to examine "...any wear indications that required RPC testing." The NRC staff notes that it is difficult to use bobbin signals to differentiate a crack in a wear scar. If a crack is present in a wear scar but is assumed to not exist, an assessment of the wear scar could lead to an underprediction of its severity.

a. Provide your technical basis for determining when wear indications are inspected using a rotating probe.

b. Given that not all wear scars are inspected with a rotating probe, discuss how you incorporate the potential for undetected cracks (in wear scars) into your tube integrity calculations and conclusions.

<u>Question pertaining to the November 15, 2004, letter</u>

6. Section 4.0 states that Attachment 2 denotes the location and percent wall-thickness penetration for each indication, and that the only flaws that were sized and left in service are for wear.

   a. In Attachment 2, one tube (SG31-R6-C22) is denoted as having a 29 percent through-wall penetration at the TTS location. Clarify whether this indication is due to wear and the source of the wear (e.g., loose part, etc.).

   b. Discuss whether a foreign object search and retrieval was performed and whether any loose parts were removed from the SGs. If loose parts were detected but not removed, discuss whether you performed an engineering assessment on the impact that loose parts may have had on tube integrity and the results of that assessment.

Waterford Steam Electric Station, Unit 3

cc:

Mr. Michael E. Henry, State Liaison Officer
Department of Environmental Quality
Permits Division
P.O. Box 4313
Baton Rouge, Louisiana 70821-4313

Vice President Operations Support
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Director
Nuclear Safety Assurance
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

Wise, Carter, Child & Caraway
P. O. Box 651
Jackson, MS 39205

General Manager Plant Operations
Waterford 3 SES
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

Licensing Manager
Entergy Operations, Inc.
17265 River Road
Killona, LA 70066-0751

Winston & Strawn
1700 K Street, N.W.
Washington, DC 20006-3817

Resident Inspector/Waterford NPS
P. O. Box 822
Killona, LA 70066-0751

Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

Parish President Council
St. Charles Parish
P. O. Box 302
Hahnville, LA 70057

Executive Vice President
& Chief Operating Officer
Entergy Operations, Inc.
P. O. Box 31995
Jackson, MS 39286-1995

Chairman
Louisiana Public Services Commission
P. O. Box 91154
Baton Rouge, LA 70825-1697