UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 7, 2015

Vice President, Operations
Entergy Operations, Inc.
Waterford Steam Electric Station, Unit 3
17265 River Road
Killona, LA 70057-3093

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 – REVIEW OF STEAM GENERATOR TUBE INSPECTION REPORT FOR REFUELING OUTAGE 19 (TAC NO. MF5174)

Dear Sir or Madam:

By letter dated November 6, 2014, as supplemented by letter dated May 21, 2015, Entergy Operations, Inc. (the licensee) submitted its steam generator tube inspection report for Waterford Steam Electric Station, Unit 3, in accordance with Technical Specification (TS) Section 6.9.1.5, "Steam Generator Tube Inspection Report." The report summarizes the steam generator tube inspections that the licensee performed during Refueling Outage 19.

The U.S. Nuclear Regulatory Commission (NRC) staff completed its review of the submittals and concluded that the licensee provided the information required by the TS. No additional followup is required at this time. This completes the NRC staff's efforts for Task Assignment Control No. MF5174. The enclosure documents the NRC staff's review of the submittals.

If you have any questions, please contact me at 301-415-3229 or Michael.Orenak@nrc.gov.

Sincerely,

Michael D. Orenak, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure:
Review of the Steam Generator Tube
Inspection Report

cc w/enclosure: Distribution via Listserv

REVIEW OF THE REFUELING OUTAGE 19

STEAM GENERATOR TUBE INSERVICE INSPECTIONS

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

By letter dated November 6, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14314A032), as supplemented by letter dated May 21, 2015 (ADAMS Accession No. ML15147A087), Entergy Operations, Inc. (the licensee) submitted information summarizing the results of the spring 2014 steam generator (SG) tube inspections performed at Waterford Steam Electric Station, Unit 3 (Waterford), during refueling outage (RFO) 19. It is also noted that by letter dated October 7, 2014 (ADAMS Accession No. ML14150A100), the U.S. Nuclear Regulatory Commission (NRC) staff summarized a discussion that was held with the licensee during RFO 19 regarding the ongoing SG tube inspections.

Waterford has two Westinghouse Electric Company Delta 110 SGs that were installed in 2013. Each SG contains 8,968 thermally treated Alloy 690 tubes, with a nominal outside diameter of 0.750 inches and nominal wall thicknesses of 0.044 inches for rows 1 and 2 and 0.043 inches for the remaining rows. The tubes are hydraulically expanded at both ends for the full depth of the tubesheet and are supported by eight Type 405 stainless steel tube support plates (TSPs) with trefoil-shaped holes arranged on a triangular pitch. Five sets of anti-vibration bars provide support for the U-bend region of the tube bundle.

The licensee provided the scope, extent, methods, and results of its SG tube inspections in the documents referenced above. In addition, the licensee described corrective actions (i.e., tube plugging) taken in response to the inspection findings.

After reviewing the information provided by the licensee, the staff has the following comments and observations:

- RFO 19 was the first inservice inspection (ISI) for the replacement SGs. During the preservice inspection, several "wear-like" indications were detected. There was no appreciable change in the bobbin coil signatures for these wear-like indications between the preservice inspection and the first ISI, suggesting little to no advancement of degradation and that the mechanism is not associated with traditional tube vibration mechanisms.

- Due to feedwater pipe vibrations during Cycle 19, the licensee elected to perform a visual inspection of the feedring structural supports and the thermal liner welds. No anomalies were noted.

- The only service-induced degradation was anti-vibration bar (AVB) wear in both SGs (approximately 44 indications). Four tubes with AVB wear were preventatively plugged in SG 32.

- Since an industry qualified technique for the detection of wear in dented TSPs does not exist, an inspection of the tubes that have been dented at TSP intersections was performed with a rotating probe equipped with a +Point™ coil.

The position of the AVBs was verified during the preservice inspection. The AVBs are uniformly installed in all of the columns in accordance with the design.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by Technical Specification Section 6.9.1.5, "Steam Generator Tube Inspection Report." In addition, the staff concludes that there are no technical issues that warrant follow-up action at this time since the inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units.

July 7, 2015

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/RA/

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