



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

August 13, 2012

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

SUBJECT: REVIEW OF THE 2011 STEAM GENERATOR TUBE INSPECTION REPORT  
FOR WATERFORD STEAM ELECTRIC STATION, UNIT 3 (TAC NO. ME7601)

Dear Sir or Madam:

By letters dated November 3, 2011, and June 26, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML113080090 and ML12180A269, respectively), Entergy Operations, Inc. (the licensee), submitted information pertaining to the steam generator (SG) tube inspections performed during refueling outage 17, which occurred in the spring of 2011, at the Waterford Steam Electric Station, Unit 3. In addition to these reports, the U.S. Nuclear Regulatory Commission (NRC) staff summarized two conference calls held with the licensee, concerning the 2011 SG tube inspections, in a letter dated May 23, 2011 (ADAMS Accession No. ML111380641). Information the licensee provided in support of these conference calls is available at ADAMS Accession No. ML11137A201.

The NRC staff has completed its review of these reports and concludes that the licensee provided the information required by its technical specifications and that no additional follow-up is required. The staff's review of the reports is enclosed.

If you have any questions, please contact me at (301) 415-1480 or by e-mail at [kaly.kalyanam@nrc.gov](mailto:kaly.kalyanam@nrc.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "N. Kalyanam".

N. Kalyanam, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure:  
As stated

cc w/encl: Distribution via Listserv

REVIEW OF THE 2011 STEAM GENERATOR TUBE

INSERVICE INSPECTION REPORT

ENERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

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Waterford, Unit 3, has two Model 70 SGs designed and fabricated by Combustion Engineering. The mill-annealed Alloy 600 SG tubes have an outside diameter of 0.750 inches and a nominal wall thickness of 0.048 inches. Each SG contains 9,350 tubes. The tubes are explosively expanded for the full depth of the tubesheet at each end and are supported by a number of carbon steel lattice-grid (i.e., eggcrate) tube supports, diagonal bars (also referred to as batwings), and vertical straps. The tubes in rows 1 through 18 are U-bends and the tubes in rows 19 through 147 are square bends. The upper end of the batwings are connected by a double-sided weld to a wrap around bar located in the periphery of the tube bundle. The center region of the tube bundle contains no tubes and is referred to as the stay-cavity region.

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 (e.g., tube plugging) taken in response to the inspection findings.

Degradation of the batwings in the stay-cavity region was first observed in 2005 in one of the SGs. This degradation is summarized in the NRC Information Notice 2005-29, "Steam Generator Tube and Support Configuration," dated October 27, 2005 (ADAMS Accession No. ML052280011). Additional batwing degradation has been detected in subsequent outages. The degradation of the batwings led to several corrective actions including stabilizing and plugging many tubes, additional analyses, and enhanced inspections in this region. The SGs at Waterford, Unit 3, are scheduled for replacement during its fall 2012 refueling outage. As a result, the 2011 inspections were the last planned inspections for these SGs; however, the licensee has performed inspections that would allow using the currently installed SGs for another operating cycle, should such a need arise.

Enclosure

Based on a review of the reports submitted, the NRC staff has the following observations and comments:

The licensee provided a revised Table E-1 in its letter dated June 26, 2012, that corrected some erroneous entries in the Table E-1 provided with the letter dated November 3, 2011.

The NRC staff has completed its review of these reports and concludes that the licensee provided the information required by its technical specifications, and that no additional follow-up is required.

August 13, 2012

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Sincerely,  
*/RA/*

N. Kalyanam, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
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ADAMS Accession No. ML12201A289

\*SE Input from ESGB

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