



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

August 20, 2018

Site Vice President
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 THE
SPRING 2017 STEAM GENERATOR TUBE INSERVICE INSPECTIONS
DURING REFUELING OUTAGE 21 (EPID L-2017-LRO-0064)

Dear Sir or Madam:

By letter dated November 21, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17325B762), Entergy Operations, Inc. (the licensee) submitted information to the U.S. Nuclear Regulatory Commission (NRC) summarizing the results of the spring 2017 steam generator tube inspections performed at Waterford Steam Electric Station, Unit 3 (Waterford 3). These inspections were performed during refueling outage 21.

The NRC staff has completed its review of the information provided and concludes that the licensee provided the information required by the Waterford 3 technical specifications. No additional followup is required at this time. The staff's review summary is enclosed.

If you have any questions, please contact me at 301-415-1390 or via e-mail at April.Pulvirenti@nrc.gov.

Sincerely,

A handwritten signature in cursive script that reads "April L. Pulvirenti".

April L. Pulvirenti, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-382

Enclosure:
Review of the Steam Generator Tube
Inspection Report

cc: Listserv

REVIEW OF SPRING 2017 STEAM GENERATOR TUBE INSERVICE

INSPECTIONS PERFORMED DURING REFUELING OUTAGE 21

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

By letter dated November 21, 2017 (Agencywide Documents Access and Management System Accession No. ML17325B762), Entergy Operations, Inc. (the licensee) submitted information summarizing the results of the spring 2017 steam generator (SG) tube inspections performed at Waterford Steam Electric Station, Unit 3 (Waterford 3). These inspections were performed during refueling outage 21 (RFO 21).

Waterford 3 has two Westinghouse Delta 110 SGs that were installed in 2013. Each SG contains 8,968 thermally treated Alloy 690 tubes with a nominal outside diameter of 0.75 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 letter dated November 21, 2017. In addition, the licensee described corrective actions (e.g., tube plugging) taken in response to the inspection findings.

After reviewing the information provided by the licensee, the U.S. Nuclear Regulatory Commission (NRC) staff has the following comments/observations:

- Tube wear from the TSPs (TSP wear) was noted for the first time in the RFO 21 inspections. Two tubes with TSP wear were plugged in SG 31.
- The licensee performed visual inspections of the upper steam drum components and reported that there were no identified anomalies. The steam drum region inspections included the: steam outlet nozzle venturis, mid-deck region, primary separator inside diameter (ID) above the swirl vanes, lower deck region, feeding spray cans and ID region, feeding structural supports, thermal sleeve to nozzle/pipe welds, and the sludge collector internals. The licensee also noted that the moisture separation equipment is constructed using carbon steels with measurable chrome content or nickel-based alloys, and therefore, erosion/corrosion of these components is not expected.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by the Waterford 3 technical specifications. In addition, the staff concludes that there are no technical issues that warrant followup 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.

Enclosure

SUBJECT: WATERFORD STEAM ELECTRIC STATION, UNIT 3 - REVIEW OF THE
SPRING 2017 STEAM GENERATOR TUBE INSERVICE INSPECTIONS
DURING REFUELING OUTAGE 21 (EPID L-2017-LRO-0064)
DATED AUGUST 20, 2018

DISTRIBUTION:

PUBLIC

PM File Copy

RidsACRS_MailCTR Resource

RidsNrrDmlrMccb Resource

RidsNrrDorlLpl4 Resource

RidsNrrPMWaterford Resource

RidsNrrLAPBlechman Resource

RidsRgn4MailCenter Resource

PKlein, NRR

AJohnson, NRR

AHuynh, NRR

ADAMS Accession No. ML18228A846

***via memorandum**

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DMLR/MCCB/BC*	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM
NAME	APulvirenti	PBlechman	SBloom	RPascarelli	APulvirenti
DATE	08/20/18	08/20/18	08/09/18	08/20/18	08/20/18

OFFICIAL RECORD COPY