



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

July 9, 2013

Vice President, Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 1 - SUMMARY OF MAY 10, 2013,
CONFERENCE CALL REGARDING THE 2013 STEAM GENERATOR TUBE
INSPECTIONS (TAC NO. MF1890)

Dear Sir or Madam:

On May 10, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives of Entergy Operations, Inc. (the licensee), regarding ongoing steam generator (SG) tube inspection activities at Arkansas Nuclear One, Unit 1. The licensee provided information in support of this conference call, which is available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML13133A119. Additional information was provided by the licensee, which is summarized in the enclosed summary.

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 did not identify any issues that required follow-up action at this time; however, the staff asked to be notified in the event that any unusual conditions were detected during the remainder of the outage or if a tube fails an in-situ pressure test.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Kaly Kalyanam", with a horizontal line underneath.

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

Docket No. 50-313

Enclosure:
As stated

cc w/encl: Distribution via Listserv

SUMMARY OF MAY 10, 2013, CONFERENCE CALL
2013 STEAM GENERATOR TUBE INSPECTION RESULTS
ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR ONE, UNIT 1
DOCKET NO. 50-313

On May 10, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives of Entergy Operations, Inc. (the licensee), regarding ongoing steam generator (SG) tube inspection activities at Arkansas Nuclear One, Unit 1. The licensee provided information in support of this conference call, which is available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML13133A119.

The SGs at ANO-1 are Enhanced Once-Through Steam Generators (EOTSG) manufactured by AREVA. The EOTSG is a straight shell and tube type heat exchanger installed in a vertical position. The Alloy 690 thermally treated tubing has a 0.625-inch diameter and a 0.037-inch wall thickness. The tubes were expanded hydraulically for the full depth of the tubesheet. There are 15 tube support plates that are constructed of Type 410 Stainless Steel. These supports have a trefoil-shaped hole design.

Additional information provided by the licensee during the conference call is summarized below:

1. This inspection was the fifth inspection of the replacement SGs.
2. The inspections of the peripheral tubes from the 9th tube support plate (09S) to the upper tube-end are to look for signs of denting to identify locations where the tube support plates may be hanging up. Dents are being reported if their amplitude is greater than or equal to 0.3 volts. More dents are being identified in this outage than were identified during last outage.
3. There were no issues identified as a result of the plug inspection.
4. Some additional tubes were inspected since two more tie rods were identified with bowing.
5. The neighboring tubes adjacent to the tube in row 25 tube 72 in SG B had matching tube-to-tube wear (TTW) indications.
6. The licensee clarified that the numbers reported for the tube support wear and TTW are the number of indications. The number of indications is based on the inspections performed this outage which did not include 100 percent of the tubes.

Enclosure

7. Some new TTW indications were identified in this outage but none had high growth rates.
8. The licensee indicated that the SGs at ANO 1 have approximately 1000 wear indications to date. The licensee indicated that the majority of the wear indications identified during the 2013 refueling outage are 4-5 percent through-wall.
9. The licensee indicated that the deepest TTW indication in SG B was 25 percent through-wall (and that this indication measured 26 percent through-wall in prior inspections).
10. The +Point probe and X-probe were used to size TTW indications. The depth estimates were within a few percent of each other. The licensee indicated that it was using a new X-probe TTW sizing technique developed by the electric Power Research Institute during this refueling outage. The licensee indicated that it plans to use this technique for future SG inspections. During the prior outage, the array probe was used to size TTW (using a loose parts wear sizing technique).
11. The licensee indicated that there was a typographical error in the four graphs of of its notes. The refueling outage stated in the graphs is not "23" but rather "24." The licensee indicated that one periphery tube was preventatively plugged and stabilized in SG B for tube support plate wear at 09S. The indication grew from approximately 15 to 30 percent in one cycle. The indication is near the aspirating point where the velocities are high.
12. The tubes repaired for tie rod bowing were repaired based on the following considerations: a) experiencing four thermal cycles; b) extent of bowing; and c) the amount of interaction with other tubes as a result of residual bowing. Bowing in the upper regions of the tube bundle is not a concern for tube wear.
13. All four SG bowls were visually inspected and there were no adverse conditions.
14. The licensee is evaluating whether they can skip the inspection next outage.

The following abbreviations are used in the document provided by the licensee:

CM = condition monitoring
CMOA = condition monitoring operational assessment
ECT = eddy current test
OTSG = once through steam generator
TMI-1 = Three Mile Island, Unit 1
TSP = tube support plate
TWD = through wall depth

The NRC staff did not identify any issues that required follow-up action at this time; however, the staff asked to be notified in the event that any unusual conditions were detected during the remainder of the outage or if a tube fails an in-situ pressure test.

July 9, 2013

Vice President, Operations
Arkansas Nuclear One
Entergy Operations, Inc.
1448 S.R. 333
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 1 - SUMMARY OF MAY 10, 2013,
CONFERENCE CALL REGARDING THE 2013 STEAM GENERATOR TUBE
INSPECTIONS (TAC NO. MF1890)

Dear Sir or Madam:

On May 10, 2013, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives of Entergy Operations, Inc. (the licensee), regarding ongoing steam generator (SG) tube inspection activities at Arkansas Nuclear One, Unit 1. The licensee provided information in support of this conference call, which is available in the Agencywide Documents Access and Management System (ADAMS) at Accession No. ML13133A119. Additional information was provided by the licensee, which is summarized in the enclosed summary.

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 did not identify any issues that required follow-up action at this time; however, the staff asked to be notified in the event that any unusual conditions were detected during the remainder of the outage or if a tube fails an in-situ pressure test

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

Sincerely,

/ra/

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

Docket No. 50-313

Enclosure:
As stated

cc w/encl: Distribution via Listserv

DISTRIBUTION:

PUBLIC
LPLIV R/F
RidsAcrsAcnw_MailCTR Resource
RidsNrrDeEsgb Resource

RidsNrrDorIDpr Resource
RidsNrrDorLpI4 Resource
RidsNrrPMANO Resource
RidsNrrLAJBurkhardt Resource

RidsOgcRp Resource
RidsRgn4MailCenter Resource
KKarwoski, NRR/DE/ESGB
AObodoako, NRR/DE/ESGB

ADAMS Accession No. ML13172A029

*memo dated

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DE/ESGB/BC	NRR/DORL/LPL4/BC	NRR/DORL/LPL4/PM
NAME	NKalyanam	JBurkhardt	GKulesa*	MMarkley	NKalyanam
DATE	7/9/13	7/5/13	6/19/13	7/9/13	7/9/13

OFFICIAL RECORD COPY