DUKE ENERGY®

**Scott L. Batson**
Vice President
Oconee Nuclear Station

**Duke Energy**
ON01VP | 7800 Rochester Hwy.
Seneca, SC 29672

o: 864.873.3274
f: 864.873.4208
Scott.Batson@duke-energy.com

April 15, 2013

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station, Unit 3
Docket No. 50-287
Unit 3 End of Cycle (EOC) 26 Refueling Outage
Request for Additional Information (RAI) Response to
3EOC26 Steam Generator Inspection

On August 27, 2012, Duke Energy submitted information summarizing the results of the 2012 Steam Generator (SG) tube inservice inspections performed during the Oconee Nuclear Station (ONS) Unit 3 EOC26 Refueling Outage (ML12242A553). In addition to this report, the Nuclear Regulatory Commission (NRC) staff summarized an April 30, 2012, conference call about the 2012 SG tube inspections at ONS Unit 3 in a letter dated June 28, 2012 (ML12178A206).

On December 6, 2012, the NRC Staff electronically sent a draft request for additional information regarding this SG report. The enclosure provided in this submittal contains Duke Energy's response to the RAI.

This submittal document contains no regulatory commitments.

If you have any questions or require additional information, please contact Corey Gray at (864) 873-6325

Sincerely,

Scott L Batson,
Site Vice President

Enclosure

A047
NRR

xc (w/enclosure):

Victor McCree
Region II Administrator
U. S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

John Boska
Project Manager
(by electronic mail only)
U. S. Nuclear Regulatory Commission
U. S. White Flint North, M/S O-8G9A
11555 Rockville Pike
Rockville, MD 20852-2746

cc (w/o enclosure):

Ed Crowe
NRC Senior Resident Inspector
Oconee Nuclear Station

Susan Jenkins
Section Manager
Division of Waste Management
Bureau of Land and Waste Management
SC Dept. of Health & Environmental Control
2600 Bull St.
Columbia, SC 29201

Duke Response to RAI's dated December 6, 2012

By letter dated 8/27/12, ML12242A553, Duke submitted the Oconee U3 SG tube inspection report. In addition to this report, the NRC staff summarized a conference call about the 2012 steam generator tube inspections at Oconee Unit 3 in a letter dated June 28, 2012 (ADAMS Accession No. ML12178A206). The NRC staff has the following draft RAIs:

1. Paragraph "g" in the inspection report states that tube-to-tube wear was observed between the 7th and 8th tube support plates (TSPs) and that the worst case observed wear was 8.6 inches in length.

    a. Please confirm the worst case observed length for tube-to-tube wear, as the Service Induced Degradation Table appears to show an indication of 9.17 inches in the tube in row 91 column 51 of SG 3A.

    Duke Response

    The worst case observed tube-to-tube wear indication was 8.6 inches in length. The indication reported as 9.17 inches long in row 91 column 51 of SG 3A was with a bobbin probe. This indication was further characterized with an array probe and it was determined that two indications were actually present. One indication measured 8.05 inches in length and the other measured 5.93 inches in length. A bounding length of 20 inches was conservatively used for structural integrity analysis.

    b. Please discuss any tube-to-tube wear found outside the region between the 7th and 8th TSPs, as the Service Induced Degradation Table appears to show tube-to-tube wear between the 9th and 10th TSPs (e.g., in the tube in row 128 column 90 of SG 3A).

    Duke Response

    There were no confirmed tube-to-tube wear indications reported outside the 7th and 8th TSP. The indication in tube R128-T90 in SG 3A was reported as no degradation found by the array probe.

    c. Please provide tubesheet maps showing the locations of tube-to-tube wear for both Oconee Unit 3 SGs.

    Duke Response

    See attached.

    d. Please discuss any insights regarding the root cause of the tube-to-tube wear.

    Duke Response

    The cause of the tube-to-tube wear is believed to be lateral deflection of the tubes during heat-up when the shell is cooler than the tubes. The tubes with the highest compressive forces are most subject to this effect.

2. Please provide definitions for the following terms that were used in the Service Induced Degradation Tables of the report: MLT, FLT, CTR.

   Duke Response

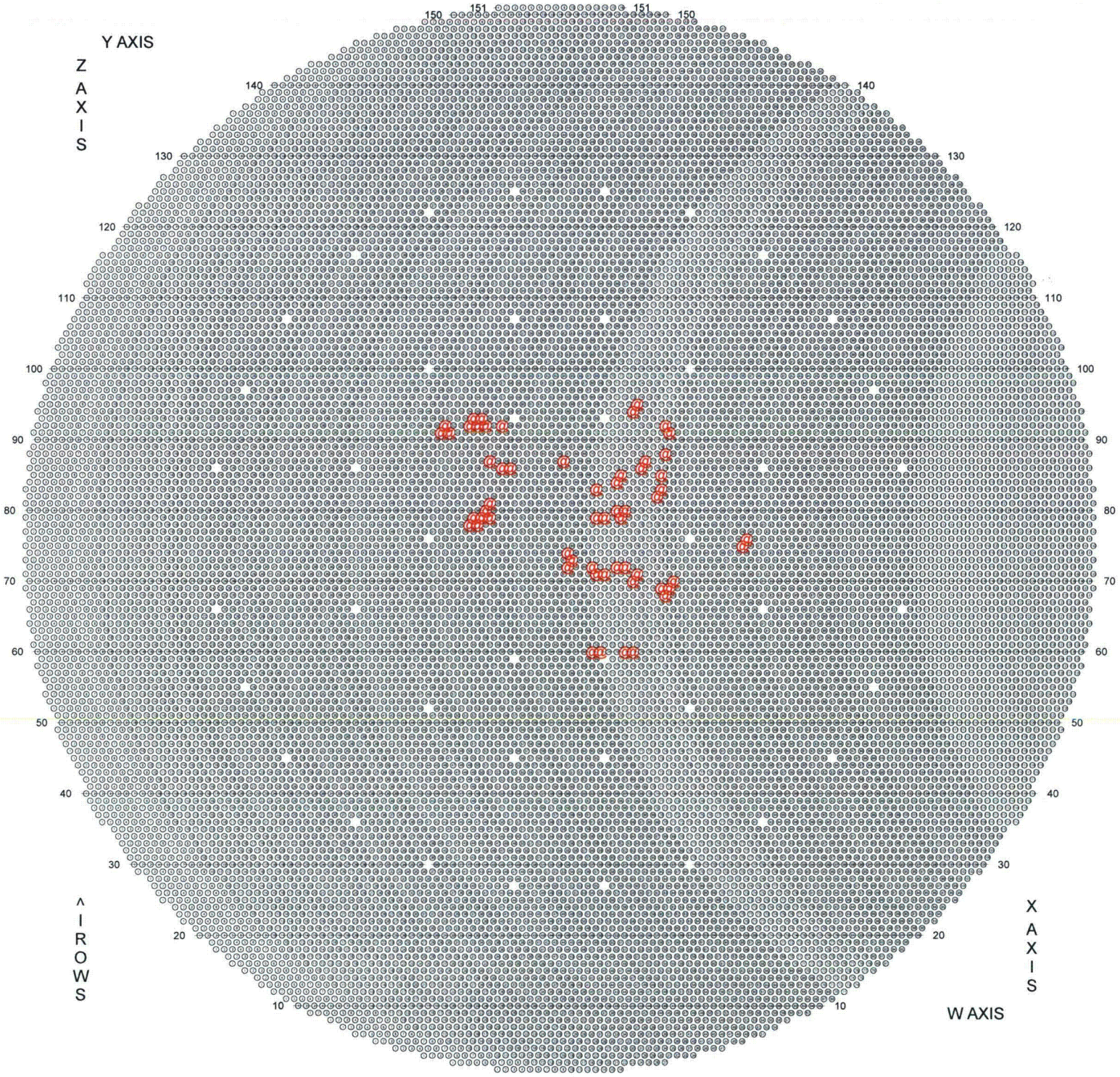
   MLT= Multiple Wear Indications
   FLT= Flat Wear Identified
   CTR = Center Span Indication

3. During the outage conference call, it was noted that two foreign objects had been found in SG 3A, one on the 11$^{th}$ TSP and one on the lower tubesheet. Please confirm the foreign objects were either removed or that an engineering evaluation was performed and the evaluation results indicated it was acceptable to leave the foreign objects in the steam generator until the next inspection.

Duke Response

The foreign object at the lower tubesheet was removed from the steam generator. The foreign object at the 11$^{th}$ tube support plate was evaluated and found acceptable to leave in service.

Roger Template #6036083.dwg




# ONS3 Repl Outage

AREVA - FDMS map module Version 9.0

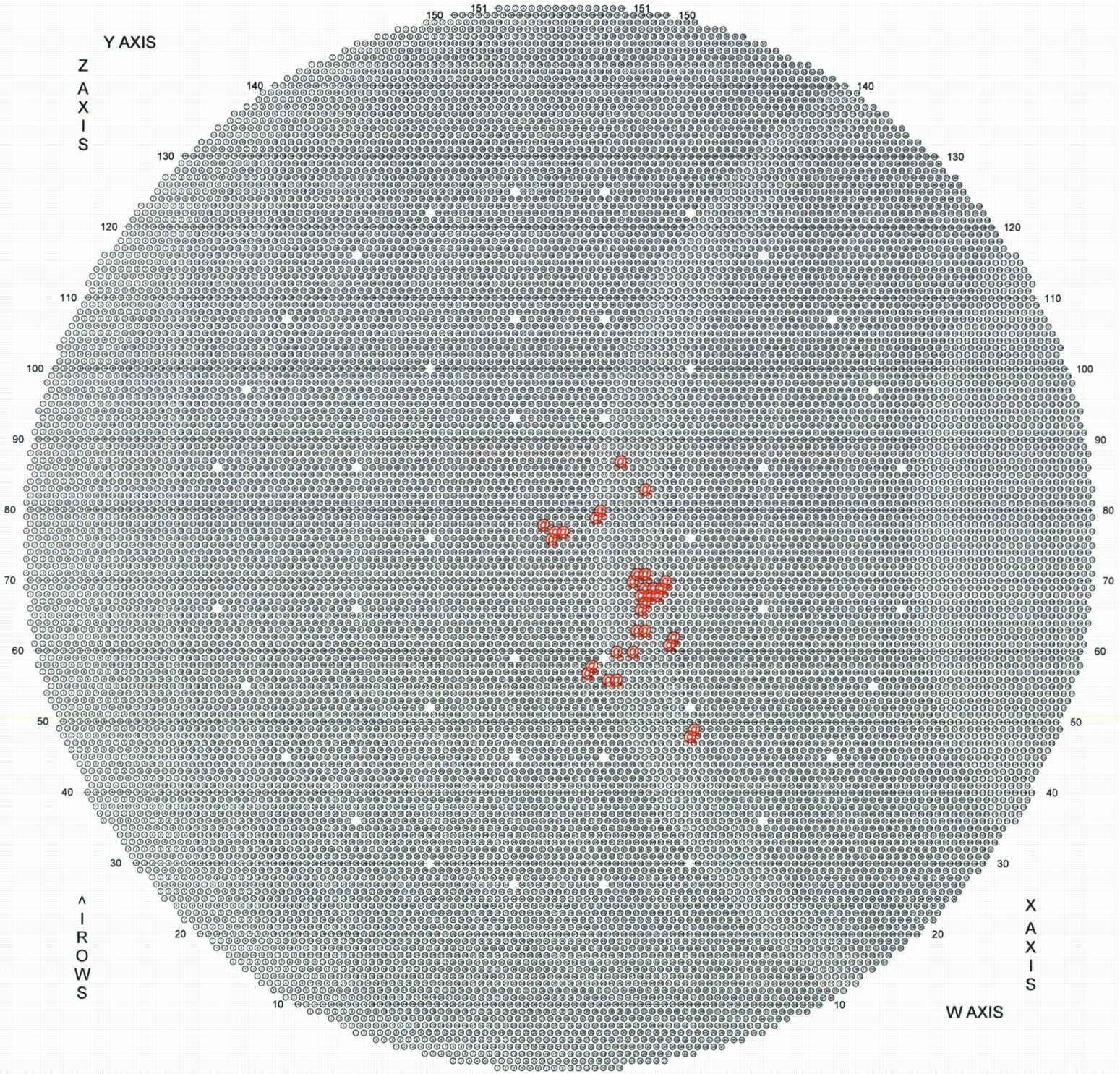
S/G A
PRIMARY FACE
OUTLET

| | |
|---|---|
| TOTAL TUBES: | 15631 |
| TUBES SELECTED: | 58 |
| OUT OF SERVICE (#): | NA |

| GROUP | TUBES |
|---|---|
| @Tube to Tube Wear | 58 |

SCALE: 0.069704 X
Mon Mar 11 13:10:48 2013

Roger Template #6036083.dwg




# ONS3 Repl Outage

AREVA - FDMS map module Version 9.0

S/G B
PRIMARY FACE
OUTLET

| | |
|---|---|
| TOTAL TUBES: | 15631 |
| TUBES SELECTED: | 32 |
| OUT OF SERVICE (#): | NA |

| GROUP | TUBES |
|---|---|
| @Tube to Tube Wear | 32 |

SCALE: 0.069704 X
Mon Mar 11 13:34:01 2013