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June 27, 2011

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555

Subject: Duke Energy Carolinas, LLC (Duke Energy)  
Catawba Nuclear Station, Unit 2  
Docket Number 50-414  
Steam Generator In-service Inspection Summary  
Report for End of Cycle 17 Refueling Outage  
Response to NRC Requests for Additional  
Information (RAIs)  
TAC No. ME5834

On January 19, 2011 and April 5, 2011, Duke Energy provided reports summarizing the results of the steam generator inspection associated with the subject outage. On May 18, 2011, the NRC electronically provided a set of RAIs in response to these reports. The purpose of this letter is to respond to these RAIs.

The RAI responses are contained in the attachment to this letter. The format of the response is to restate each NRC question, followed by our response.

There are no regulatory commitments contained in this letter or its attachment.

If you have any questions concerning this material, please call L.J. Rudy at (803) 701-3084.

Very truly yours,

James R. Morris

LJR/s

Attachment

A047  
WRR

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xc (with attachment):

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Attachment

Catawba Unit 2 End of Cycle 17 Steam Generator In-service Inspection Summary  
Report NRC RAI Response

REQUEST FOR ADDITIONAL INFORMATION  
CATAWBA NUCLEAR STATION, UNIT 2  
2010 STEAM GENERATOR TUBE INSPECTIONS  
TAC NO. ME5834  
DOCKET NO. 50-414

By letters dated January 19 (ADAMS Accession No. ML110200322) and April 5, 2011 (ADAMS Accession No. ML110980601), Duke Power Company, LLC (the licensee), submitted information summarizing the results of the 2010 steam generator tube inspections at Catawba Nuclear Station Unit 2. These inspections were performed during refueling outage 17 (RFO 17).

The NRC staff has reviewed the information the licensee provided and determined that the following additional information is needed in order to complete the review.

1. Please discuss the results of the visual inspection of the plugged tubes (e.g., all plugs present and no degradation detected).

**Duke Energy Response:**

**All plugs were present and no degradation was observed.**

2. Please discuss the scope and results of any secondary side SG inspections. Include in this response the extent to which any degradation was detected (e.g., at the waterbox cap plate, steam drum, feeding, J-tubes), and whether any loose parts were left in the SG. If any loose parts were left in the SGs, please discuss whether an analysis was performed to confirm that tube integrity would be maintained until the next SG tube inspection.

**Duke Energy Response:**

**There were no secondary side inspections performed other than Foreign Object Search and Retrieval (FOSAR). During the Fall 2010 refueling outage at Catawba Nuclear Station Unit 2, FOSAR identified foreign objects on the tubesheet of each steam generator. There were sixteen objects identified in all four steam generators; four were removed, seven were legacy objects and remain unchanged, and five parts were evaluated. Eddy current examination of the tubes surrounding these objects did not reveal any tube degradation. Evaluation of the objects not removed show that they are acceptable for at least two cycles of operation.**

A number of secondary side inspections have been performed since RFO 13. Please discuss the extent to which degradation has been observed in

secondary side internals (e.g., waterbox cap plate, moisture separators, feeding) in the last few outages.

**Duke Energy Response:**

**Each time a steam generator secondary side inspection is performed, the general condition of the components in the area of the inspection are observed and any anomalies are noted. No anomalies have been reported aside from the foreign objects.**

**During EOC13, waterbox inspections were performed with no significant erosion of the impingement plate, center and outer rib plates, or cap plates observed. One cap plate backing bar was found loose and was retrieved. No tube damage had been caused by this loose backing bar.**

**During EOC15, an inspection was performed in one steam generator of the top tube support to characterize the tube deposit loading and broach blockage. The inspection was inconclusive. Additionally, steam drum inspections were completed in two steam generators to assess their condition. No degradation was observed.**

**During EOC 16, a more comprehensive visual inspection of the uppermost tube support plate was performed in steam generator A to characterize the tube deposit loading and broach blockage. There was no evidence of broached blockage observed from deposit buildup. As expected, there are deposits on the tubes and spalled flakes.**

3. Please clarify which tube in SG C was plugged for tube support plate wear.

**Duke Energy Response:**

**Tube R49-C59 was plugged for tube support plate wear.**

4. Please provide the cumulative effective full power years of operation on the SGs at RFO 16 and RFO 17.

**Duke Energy Response:**

**Unit 2 had operated for 18.73 EFPYs at EOC16 and for 20.13 EFPYs at EOC17.**

5. A sampling approach is used for inspecting the u-bend region in rows 2 through 5 in the SGs. Please confirm that 50 percent of these u-bend region tubes are inspected by the outage nearest the midpoint, and that

100 percent of these u-bend region tubes are inspected by the endpoint of the period.

**Duke Energy Response:**

**50 percent of the u-bend region tubes have been inspected by the outage nearest the midpoint of the current period, and 100 percent of these u-bend region tubes are expected to be inspected by the endpoint of the current period.**

6. Please clarify the following sentence: "There was no degradation detected in the portion of the tubes from 20 inches below the top of the tubesheet that resulted in calculated leakage." In particular, please confirm that you are not depth sizing degradation near the tube ends for determining whether the tubes will leak during accident conditions. Please confirm you determined there would be no accident induced leakage from the indications near the tube ends since there was no observed operating leakage in the previous operating cycle.

**Duke Energy Response:**

**There was no observed operational leakage and therefore no accident induced leakage in the previous cycle. No depth sizing of indications near the tube end was performed.**

7. A number of indications at or near the tube support plates were identified during RFO 17. Are all of these indications attributed to wear with the supports, or are some of the indications a result of wear with a loose part or foreign object? Please identify.

**Duke Energy Response:**

**Some indications were attributed to wear at tube support plates and some were attributed to loose part or foreign object wear. Refer to the table on the next page.**

SG	Row	Column	Wear	SG	Row	Column	Wear
A	15	98	TSP	B	7	74	LP
A	23	70	LP	B	8	25	TSP
A	27	49	TSP	B	10	50	TSP
A	31	25	TSP	B	11	2	TSP
C	3	78	TSP	B	12	35	LP
C	7	72	LP	B	18	40	LP
C	25	10	TSP	B	23	23	LP
C	42	90	LP	B	27	52	LP
C	49	59	TSP	B	28	65	LP
D	15	80	TSP	B	32	33	LP
D	17	55	TSP	B	33	85	TSP
D	49	45	TSP	B	37	16	TSP