Duke Power
A Duke Energy Company

D.M. Jamil
Vice President, McGuire

Duke Power
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-9340
(704) 875-4000

(704) 875-5333 OFFICE
(704) 875-4809 FAX

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

Subject: McGuire Nuclear Station, Unit 2
Docket Nos. 50-370
Steam Generator Tube Inspections
Response to Request for Additional Information

By letters dated March 20 and May 30, 2002, McGuire submitted reports for the Unit 2, end of cycle 14 steam generator tube inspections, in accordance with the Technical Specifications and the American Society of Mechanical Engineers Code, Section XI reporting requirements. By letter dated January 31, 2003, the NRC requested additional information on the subject inspections. Please find attached the McGuire response to the subject request.

Questions regarding this submittal should be directed to Kay Crane, McGuire Regulatory Compliance, at (704) 875-4306.

D. M. Jamil

Attachment

A047

cc: Mr. L. A Reyes
Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30323

Mr. R. E. Martin, Project Manager
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Scott Shaeffer
Senior NRC Resident Inspector
McGuire Nuclear Station

Request for Additional Information
On Steam Generator Tube Inspection Report
Duke Power Company
McGuire Nuclear Station, Unit 2
Docket No. 50-370

1. Provide definitions for the codes HNI and CBH used in the reports under the "IND" and "LOCATION" columns, respectively. Explain how these codes are used at McGuire Unit 2.

   Response:

   "CBH" is used to mean a collector bar on the hot leg (see Attachment 1).

   "HNI" is used to indicate that an indication has been reviewed for previous history and growth, according to written guidelines, and no change has occurred. Change is defined as greater than 0.50 volts and greater than ten degrees at 400 kilohertz.

2. Identify all types of imperfections that are left in service (e.g., wear, manufacturing burnish marks, etc.), the number of each type of imperfection, their location in the steam generator and the basis for leaving them in service (e.g., depth sizing, review of historical data, etc.).

   Response:

   Wear and Manufacturing Burnish Marks (MBMs) have been left in service. The number of indications is listed in the report. Those not labeled as wear but listed in the report are MBM's. At Duke Power Company, MBM's are not labeled in the data as such but are dispositioned each inspection.

   The basis for leaving the indications in service is depth sizing and historical review. However, the historical review does not indicate that it was dispositioned as MBM in the past; therefore, each indication is dispositioned based solely on the characteristics of the data in accordance with written guidelines.

3. The report dated May 30, 2002, indicates that 2 possible loose parts (PLPs) were confirmed in each steam generator inspected. Describe the actions that were taken upon confirmation of these loose parts, and the basis for leaving them in service, if this was the result.

   Response:

   In steam generator B, there are two tubes left in service with PLP's. These tubes are located at 93-114 and 95-114. Since this is a triangular pitch steam generator, these tubes are adjacent to each other vertically. The indications are located seven inches above the third fan bar. There are two indications at each tube location. The indications were contained in both the 1999 and 2000 bobbin data but failed to meet the criteria for identification. The indications were not present during the baseline review. The indications were identified as PLP's in the plus point and bobbin data in 2002.

The indications have been in service for three years and there is no degradation. The flow in this region is vertical. A FOSAR was not conducted because access to that region is limited. The indications were acceptable by engineering judgment based on the absence of any indication of tube wall material loss.

In steam generator C, there were two tubes left in service with PLP indications, they are tubes 112-73 and 113-72. These tubes are located adjacent to each other within the pitch, interior to the tube bundle and 13 inches above the secondary face of the hot leg tubesheet. The indications were not present in the 1999 data. A review of the historical eddy current data indicates that there are deposits on the surface of these tubes.

FOSAR was not performed due to limited access. The indications are above the top of tubesheet in a lower cross flow area. There was no degradation associated with these indications. The indications were acceptable by engineering judgment.

4. The steam generator tube inspection reports indicate that a PLP was identified in the freespan in Rows 93 and 95 in steam generator B. The freespan location is an unusual location for a PLP. If not already addressed as a result of question 3, above, describe what actions were taken based on the identification of the PLP signal? Describe any theories/conclusions you have regarding the cause of the PLPs.

   Response:

   See response for question 3.

5. The report dated May 30, 2002, indicates that one tube in steam generator B, which contained a volumetric indication, was left in service. What was the volumetric indication attributed to? If it was attributed to degradation, explain the cause of the degradation, the tube and location within the tube where the degradation was identified, and the basis for leaving the tube in service.

   Response:

   In steam generator B, tube 90-67 contained an indication located at the fifth fan bar minus one and a quarter inches. The fanbars are offset axially along the tube so the reference point for measurement is the midpoint of the two fanbars. The fanbars are one and a quarter inches wide. The fanbar structure floats on top of the tube bundle. The indication was wear sized by bobbin at two percent through wall and is indicative of fan bar wear. Based on previous experience with fan bar wear, it is anticipated that the growth rate on this indication will be very low in the future.

6. The Updated Final Safety Analysis Report (UFSAR) provides some information on the design of the steam generators. Please provide additional details, as follows, which will support the staff's review of the steam generator reports, especially the tables containing the tube-by-tube listing.

A. Tube Support Plates - The UFSAR states they are an open flow lattice design. How many tube contact points are there and what is the thickness of the tube support plates?

Response:

The tube support structures at McGuire Unit 2 are lattice grids made of 410 stainless steel. The lattice grid is made of a series of high bars (approximately three inches in height) oriented at thirty degrees and one hundred fifty degrees to the tube free lane, located every sixth pitch to accommodate the steam generator loading conditions. Low bars (approximately 1 inch in height) are located at every pitch between the high bars. All of the lattice grids are the same except the lowest which incorporates a differential resistance lattice grid. The difference is that the low bars on the periphery are replaced by medium bars (approximately 2.5 inches in height).

There are four contact points on each tube.

B. What is the tube pitch?

Response:

The triangular tube pitch is 0.930 inches

C. What tube expansion method was used on the tube within the tubesheet? How thick is the tubesheet?

Response:

The tubes are hydraulically expanded the entire length of the tubesheet in both the inlet and outlet. The tubesheet is 27.1 inches thick including the clad.

D. Identify the fabricator of the steam generator tubes and the steam generators.

Duke Response:

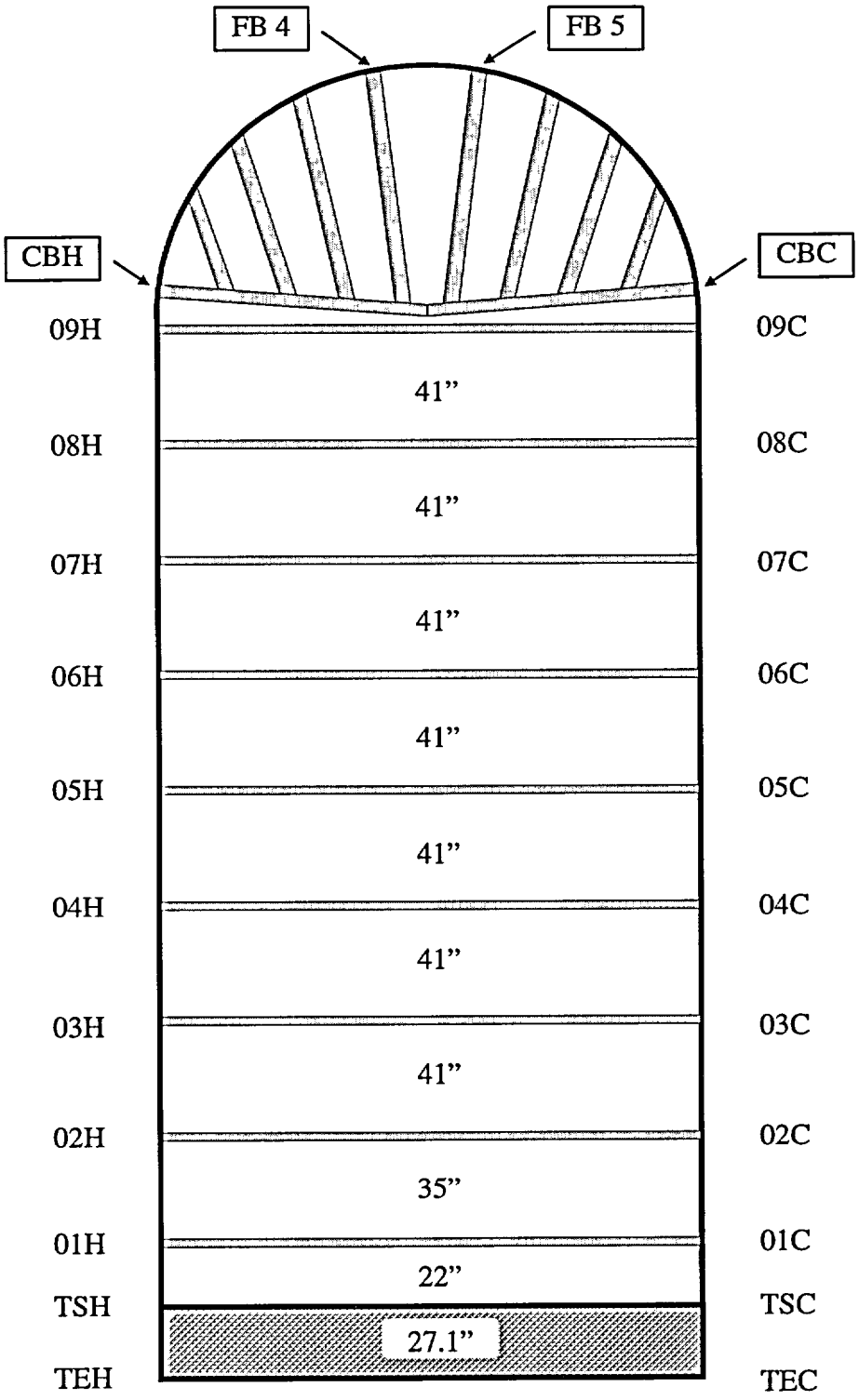
Steam Generators are Babcock & Wilcox International (BWI) CFR 80 vertical U-bend type containing 6,633 tubes each. Tubing material is thermally treated CrFeNi alloy (Inconel 690) with .688" OD and .040" nominal wall thickness manufactured by Sumitomo.

E. Please provide a diagram of the steam generator which identifies the numbering scheme of the tube support plates and the fan bars. This will enable the staff to determine the location of the imperfections identified in the tube-by-tube listings enclosed with the steam generator reports.

Duke Response:

See Attachment 1

Attachment 1
CFR 80 Steam Generator



CFR 80

Tube Information:

No. of Tubes	6633
Material:	Inconel 690
Nominal Dia.:	0.688"
Nominal Wall:	0.040"
Row 1 Radius:	3.973"
Straight Length:	31.9'/32.7'
Tube Pitch:	.930"

Tube Support Information

Type:	Lattice
Material	410 Stainless
Thickness:	
High:	3.150"
Med.:	2.562"
Low:	1.000"

Connector Bar

Material:	410 Stainless

Fan Bars

Material:	410 Stainless
Thickness	0.110"
Width	1.25"

NOTE: Dimensions are to the centerline of the tube support structures.