October 13, 2004 NRC 2004-0104

U.S. Nuclear Regulatory Commission
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Washington, DC 20555

Point Beach Nuclear Plant Unit 2
Docket 50-301
License No. DPR 27

Response to Request for Additional Information; Unit 2 Fall 2003 (U2R26)
Steam Generator Eddy Current Examinations (TAC No. MC2070)

Reference: 1) Letter from NMC to NRC dated November 7, 2003 (NRC 2003-0102)
2) Letter from NRC to NMC dated August 26, 2004 (TAC No. MC2070)

In Reference 1, Nuclear Management Company, LLC (NMC), submitted a summary of the fall 2003 Unit 2 Steam Generator Eddy Current Examinations as required by Point Beach Nuclear Plant (PBNP) Technical Specifications 5.6.8.a and 5.6.8.b. In Reference 2, NRC staff requested additional information to complete its evaluation.

The enclosures provide the NMC response to the staff's questions.

This letter contains no new commitments or changes to existing commitments.

Dennis L. Koehl
Site Vice-President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosure: 1 - Response to Request for Additional Information
2 - Tube Sheet Map and Schematic of the Unit 2 Steam Generators

cc: Regional Administrator, Region III, USNRC (w/o Enclosure 2)
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC (w/o Enclosure 2)
PSCW (w/o Enclosure 2)

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ENCLOSURE 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION POINT BEACH NUCLEAR PLANT UNIT 2 FALL 2003 (U2R26) STEAM GENERATOR EDDY CURRENT EXAMINATIONS

The following information is provided in response to the Nuclear Regulatory Commission staff's request for additional information (RAI) regarding Reference 1. .

The NRC staff's questions are restated below, with the NMC response following.

NRC Question 1:

The Steam Generators (SGs) at Point Beach Unit 2 were replaced in 1996, during Refueling Outage 22, with SGs that contain thermally-treated Inconel 690 tubes. In order for the staff to better understand the location of indications, provide a tube sheet map and a schematic of the Unit 2 SGs which depicts the tube support naming conventions. In addition, provide the following design information: SG designer and fabricator, tube manufacturer, tube wall thickness, tube pitch and pattern, tube support (including anti-vibration bar) thickness, tube sheet thickness, and the radii of row 1 tubes. In addition, discuss whether any of the low row tubes (or portions of them) were stress relieved after bending.

NMC Response:

A tube sheet map and a schematic of the Unit 2 SGs, which depicts the tube support naming conventions, are provided in Enclosure 2.

SG designer and fabricator:	Westinghouse/Westinghouse
Tube manufacturer:	Sandvik
Tube wall thickness:	0.050"
Tube pitch and pattern:	1.234" Triangular
Tube support plate thickness	1.125"
Flow Distribution plate thickness	0.74" min
Anti-vibration bar thickness:	0.190" by 0.565"
Tube sheet thickness:	22.42"
Radii of row 1 tubes:	3.25"

The tubes in rows 1 through 14 were stress relieved after bending.

ENCLOSURE 1

NRC Question 2:

In your response letter, dated March 20, 1998, to Generic Letter 97-06, "Degradation of Steam Generators Internals," you indicated several inspections were to be performed on the SGs. Please discuss the results from the most recent inspections of the following:

a) upper package - the swirl vane, moisture separator, and feed ring areas inspection

b) tube support plate ligament erosion-corrosion and cracking - secondary side upper tube bundle inspection

c) wrapper drop and wrapper cracking - sludge lancing, top of tube sheet cleanliness inspections and Foreign Object Search and Retrieval inspections

NMC Response:

Please note that our response to Generic Letter 97-06, "Degradation of Steam Generators Internals," was dated March 30, 1998.

Results from the most recent inspections of the following are discussed below.

a) Upper package - the swirl vane, moisture separator, and feed ring areas inspection.

An inspection of the Unit 2 SG swirl vanes and moisture separators was last performed during fall 2000. No degradation was noted. An inspection of the upper internals is planned for U2R27 in the spring of 2005. Please note that PBNP follows the swirl vane and moisture separator inspection guidance provided by Westinghouse, the SG manufacturer.

The Unit 2 SG feed ring and J nozzles were not inspected during U2R26. However, both the distribution ring (ASME SA-335 Grade P11) and J nozzles (ASME SB-167, UNS N06690) are corrosion/erosion resistant materials. The feed ring and J nozzle materials on the PBNP Unit 1 SGs have been in service longer and are utilized for trending wear in this area. The Unit 1 feed ring and J nozzles were last inspected in 1995 and no degradation was noted (as stated in the March 30, 1998 response to Generic Letter 97-06).

b) Tube support plate ligament erosion-corrosion and cracking - secondary side upper tube bundle inspection.

Tube support plate ligament erosion-corrosion and cracking does not apply to PBNP Unit 2. The support plates are trifoil stainless steel and the top support plate has holes in the tube lane region. An extensive visual inspection was completed in 1997 with no degradation identified. No further inspections or evaluations are required as

stated in Wisconsin Electric's letter, "Clarification of Responses to Generic Letter 97-06 Degradation of Steam Generator Internals," dated October 14, 1998.

The top support plate and low row U-bends on SG A were visually inspected during U2R26. The area was free from soft and hard sludge with a very thin deposit film indicative of good thermal performance. Also, the trifoil lobes were open and free of deposits.

c) Wrapper drop and wrapper cracking - sludge lancing, top of tube sheet cleanliness inspections and Foreign Object Search and Retrieval inspections.

As discussed in our response to Generic Letter 97-06, inspection of the wrapper is performed only if there is trouble with the sludge lance equipment. There were no fit-up concerns with the sludge lancing equipment during U2R26 and therefore the wrapper was not visually inspected during U2R26.

There were no significant foreign objects found in either Unit 2 steam generator during visual inspections of the secondary side. Some very small wires were found on the tube sheet. The debris was addressed and evaluated under PBNP's corrective action program.

NRC Question 3:

The staff was unable to locate any SG tube inspection results from refueling outage (RFO) 25. Please confirm that no SG tube inspections were performed during RFO 25. In addition, please clarify the completion dates for RFO 25.

NMC Response:

No SG tube inspections were performed during Unit 2 RFO 25.

PBNP Unit 2 reactor was placed on line after refueling outage 25 on May 14, 2002.

NRC Question 4:

For the scope of your RFO 26 inspection, you indicated "379 tubes (both ends) per SG bordering the peripheral and no-tube lane at the top of tube sheet expansion transitions" were inspected. Please clarify what you mean by "no-tube lane."

In addition, for the scope, you indicated "25 percent of the balance of top of tube sheet hot-leg expansion transitions" were inspected. Please clarify what you mean by "the balance." Were the other 75 percent of the tubes inspected in previous inspections?

NMC Response:

"No-tube lane," refers to the open area between the row 1 tubes. The blow down piping runs through this area. EPRI, "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 6, Section 3.4.1, refers to this region as the no-tube lane. No tubes penetrate the tube sheet in this area.

EPRI, "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 6, Section 3.4.1 states that all peripheral tubes including tubes adjacent to the no-tube lane regions shall be sampled. A region, two tubes deep, along the annulus and no-tube lane was inspected to meet this requirement. The statement, "25 percent of the balance of top of tube sheet hot-leg expansion transitions" were inspected, refers to the non-peripheral tubes on the hot leg. That is, the Unit 2 steam generators have 3499 tubes each; 25% of this number constitutes 875 tubes. The 875 tubes per steam generator inspected were selected from the non-peripheral tubes. In addition, 758 peripheral tubes were inspected.

Some of the other top of tube sheet hot-leg expansion transitions were inspected in the previous inspection (U2R24) of the first inspection period. Not all the top of tube sheet hot-leg expansion transitions have been inspected. The Unit 2 steam generators at PBNP are approximately half way through their first inspection period of 144 Effective Full Power Months (EFPM). EPRI, "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 6, Section 3.3.15, states that during the first inspection period, expansion transitions may be limited to 20% by the midpoint of the period. This requirement has been met. PBNP SG tubes are selected for inspection as necessary to meet the EPRI requirements. To meet the required sampling contained in the EPRI guidance, PBNP practice is to select previously uninspected tubes for examination.

NRC Question 5:

Please discuss whether any dents and/or dings have been identified in your SG tubes and if any rotating probe inspections were performed during RFO 26. If dent/dings have been identified, discuss whether the calibration procedure (for measuring dent size) is consistent with that described in Generic Letter 95-05 (or with industry guidelines). Also, discuss whether the dents and dings found during the RFO 26 inspections were traceable back to the baseline inspection and discuss any changes in magnitude. If the dents or dings are not traceable to your baseline inspection and/or have changed in magnitude, discuss the reason for any change.

NMC Response:

A total of 3 free span dent/ding indications were reported in Steam Generator A and one in Steam Generator B during U2R26. Any dent/ding indications greater than 5 volts would be additionally examined with a rotating probe to detect the presence of degradation within the dent. However, no dents/dings in either Steam Generator were greater than 5 volts.

ENCLOSURE 1

PBNP follows industry guidelines for calibration. Specifically, PBNP follows EPRI, "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 6, Section 6.2.7.5 discusses voltage normalization requirements. Bobbin coil examinations are normalized off the prime frequency differential channel at 4 volts peak to peak. As stated above, all dents greater than 5 volt would also be inspected with a motorized rotating pancake coil (MRPC). The EPRI guidance for normalizing rotating coils is also followed at PBNP.

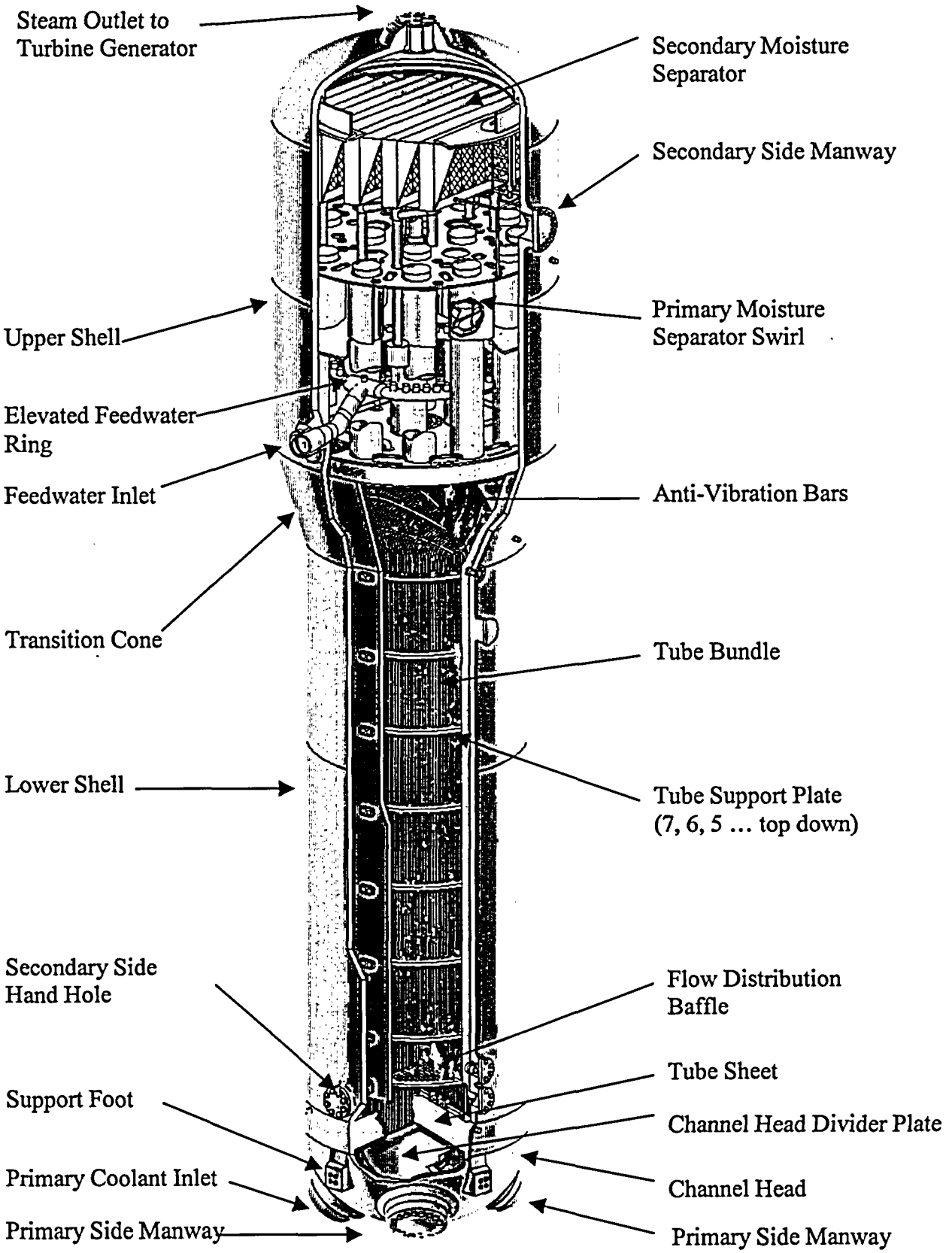
Dents/dings detected during the U2R26 examination were compared to the first Inservice Inspection (ISI) data to ascertain if any changes to the signal were present. No significant changes were noted and all tubes with dent/ding indications were left in service. Please note that in the first ISI inspection, dents with a response of less than 3 volts were not reported. However, PBNP currently uses a 2 volt threshold for reporting. Three of the four dents reported during U2R26 were below 3 volts during the first ISI inspection.

ENCLOSURE 2

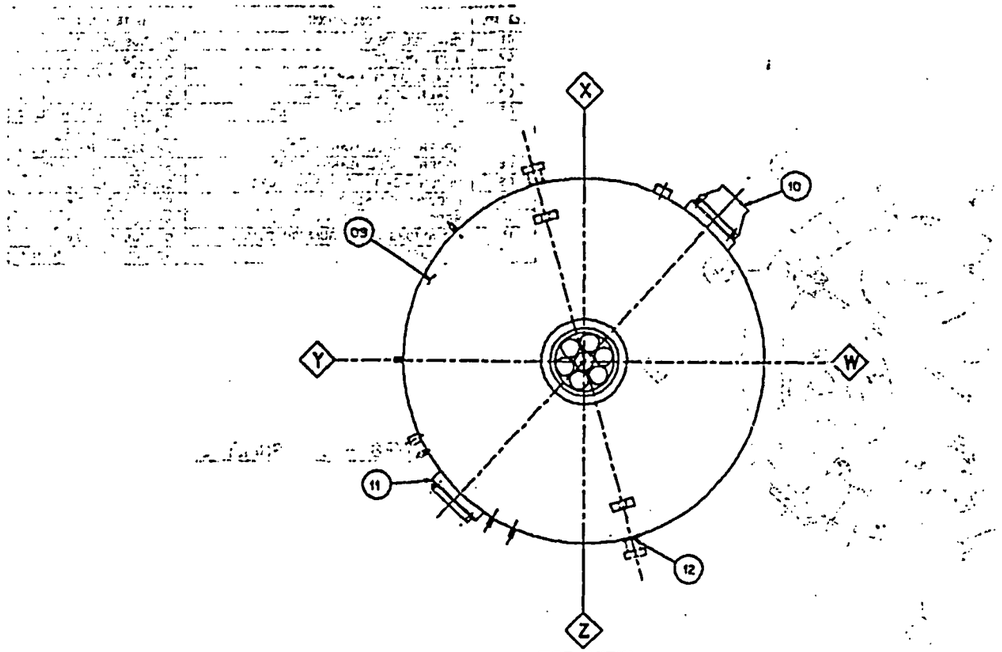
STEAM GENERATOR TUBESHEET MAP AND SCHEMATIC
POINT BEACH NUCLEAR PLANT UNIT 2

(4 pages follow)

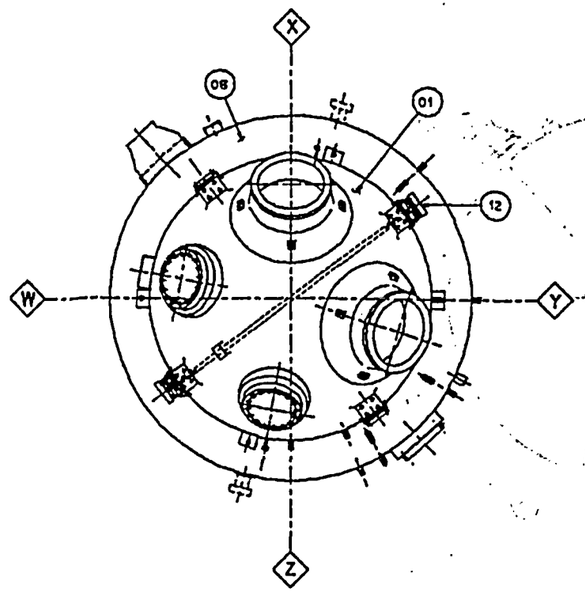
Typical Steam Generator Configuration



ITEM NO.	DESCRIPTION	MATERIAL SPEC.
C1	CHANNEL HEAD	SA-508 CL. 3
C2	TUBE PLATE	SA-508 CL. 3a
C3	LOWER STUB BARREL	SA-533 TYPE B CL. 2
C4	LOWER SHELL BARREL "A"	SA-533 TYPE B CL. 2
C5	LOWER SHELL BARREL "B"	SA-533 TYPE B CL. 2
C6	TRANSITION CONE	SA-508 CL. 3a
C7	UPPER SHELL BARREL "C"	SA-533 TYPE B CL. 2
C8	UPPER SHELL BARREL "D"	SA-533 TYPE B CL. 2
C9	UPPER HEAD W/ STEAM NOZZLE	SA-508 CL. 3a
10	FEEDWATER NOZZLE	SA-508 CL. 3a
11	SECONDARY SIDE MANWAYS	SA-508 CL. 3a
12	TRUNNIONS AND TRUNNION STUBS	SA-508 CL. 3a
13	U-TUBES	SB-163 W/ C.C. N-20-1

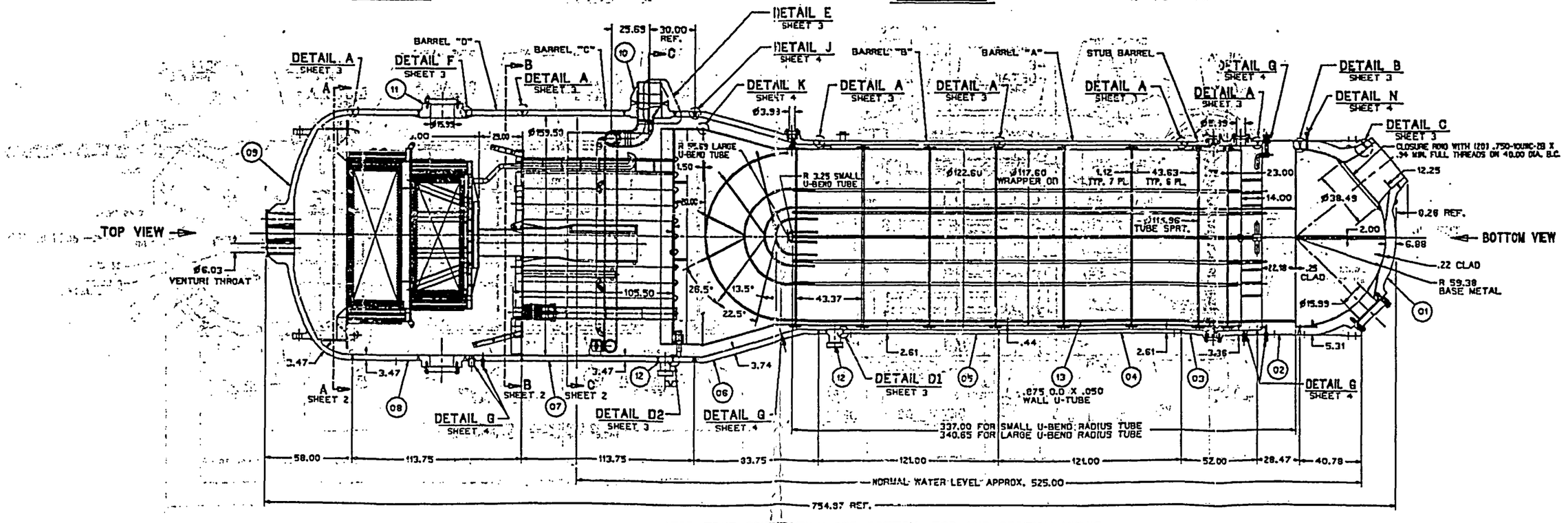


TOP VIEW



BOTTOM VIEW

NOTES - SEE SHEET 2



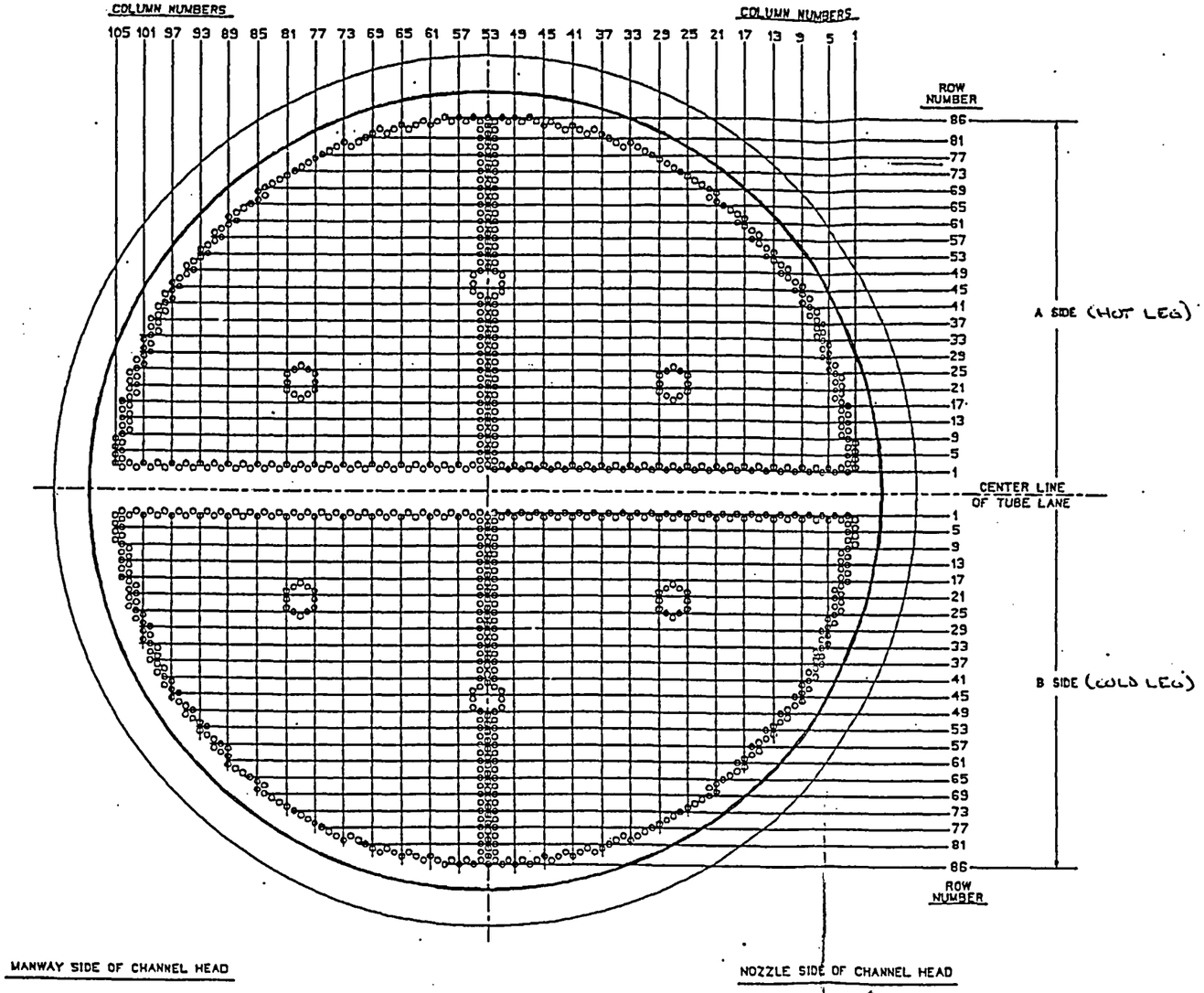
FOR TRUE ORIENTATION SEE BOTTOM, TOP AND SECTION VIEWS

TOLERANCE UNLESS OTHERWISE SPECIFIED							
ALL DIMS.	UP TO 6.00	OVER 6.00 TO 12.00	OVER 12.00 TO 24.00	OVER 24.00 TO 60.00	OVER 60.00 TO 120.00	OVER 120.00 TO 360.00	OVER 360.00
	±.12	±.18	±.26	±.38	+.50 −.38	+.76 −.50	+1.26 −.76
ANGULAR TOL. ±1° EXCEPT WELD GEOMETRY ±2°							

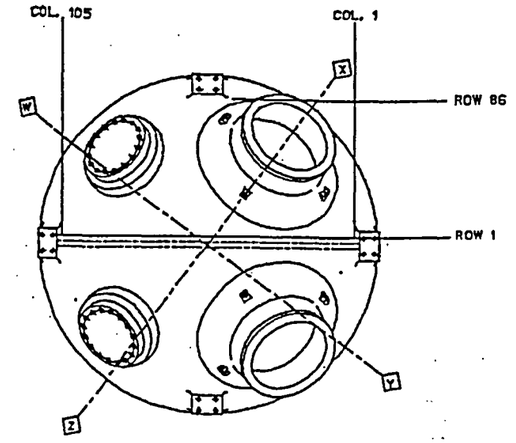
Figure 1-2 — General Arrangement
Page 1 of 4

6489E34-01

TM 1440-C370



VIEW OF PRIMARY FACE OF TUBE PLATE



STEAM GENERATOR
BOTTOM END VIEW

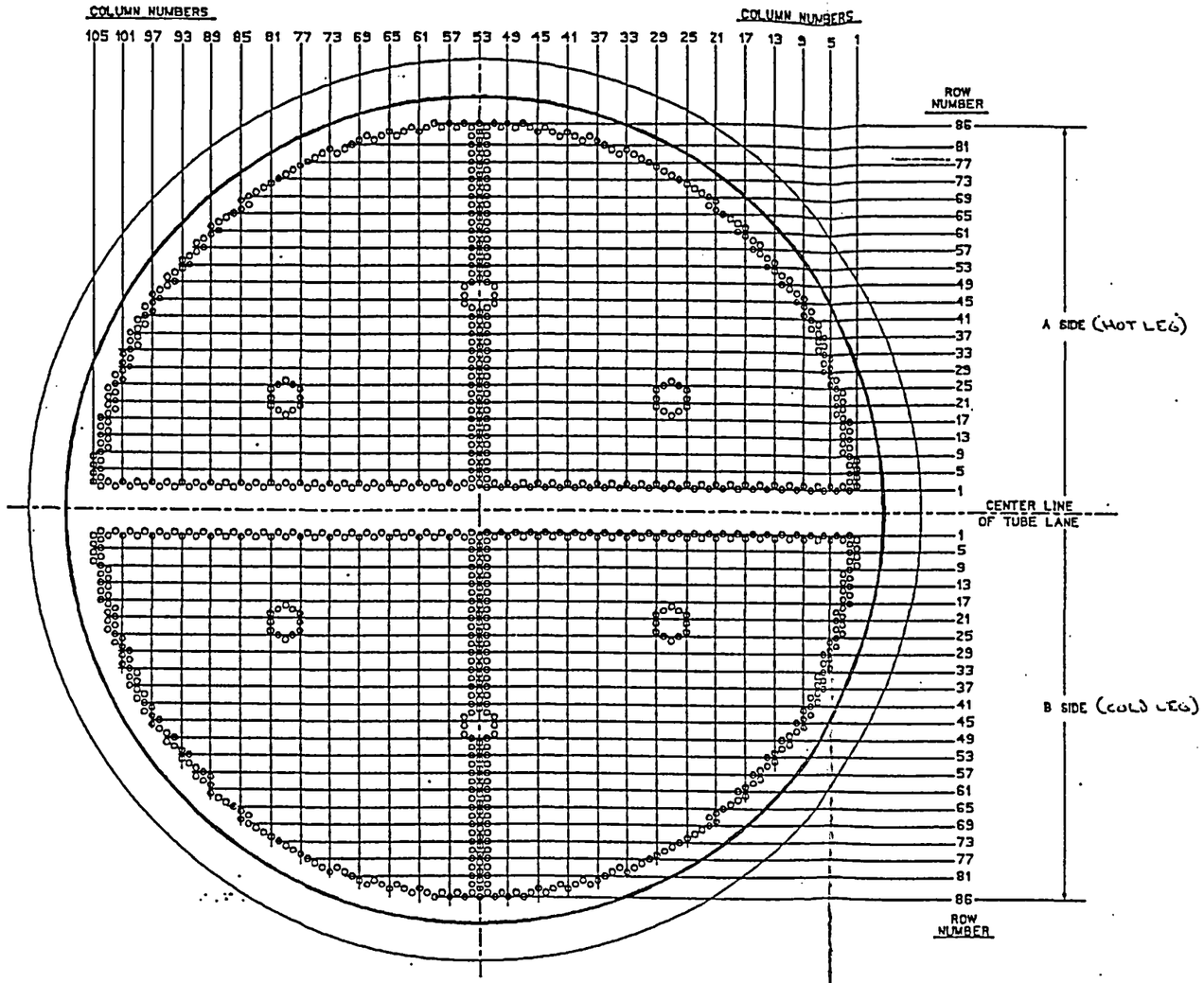
SHOP TUBE PLUGGING LOCATIONS		
SIDE(S)	ROW	COLUMN
+	+	+

+NONE PLUGGED IN SHOP

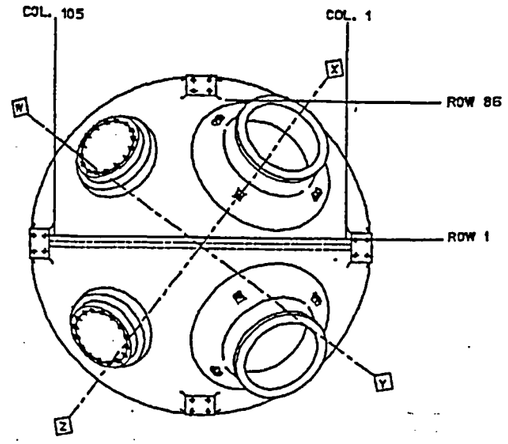
FIELD TUBE PLUGGING LOCATIONS		
SIDE(S)	ROW	COLUMN

FIELD TUBE PLUGGING LOCATIONS		
SIDE(S)	ROW	COLUMN

STEAM GENERATOR 24X-1A
Figure 5-10A — Tube Plugging Record
Shop Order 12172
Page 1 of 1



VIEW OF PRIMARY FACE OF TUBE PLATE



STEAM GENERATOR
BOTTOM END VIEW

SHOP TUBE PLUGGING LOCATIONS		
SIDE(S)	ROW	COLUMN
+	+	+

+NONE PLUGGED IN SHOP

	FIELD TUBE PLUGGING LOCATIONS		
	SIDE(S)	ROW	COLUMN
#	A,B	55	70
#	A,B	56	71
@	A,B	73	58
@	A,B	31	48

FIELD TUBE PLUGGING LOCATIONS		
SIDE(S)	ROW	COLUMN

PLUGGED IN 1988 AS A RESULT OF LOOSE PARTS WEAR

@ PLUGGED IN 2003 DUE TO EXCESSIVE TUBE NOISE

STEAM GENERATOR 2HX-1B
Figure 5-10B — Tube Plugging Record
Shop Order 12173