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Western Massachusetts Electric Company
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Docket No. 50-423
Re: 10CFR50.36
February 18, 1992
MP-92-179

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 3
Steam Generator Tube Inservice Inspection Report

This report is being submitted within 12 months following the completion of the third Inservice Eddy Current Inspection of the Millstone Unit 3 Steam Generator (SG) tubes pursuant to Technical Specification 4.4.5.5.b.

The End of Cycle 3 SG tube inspection was completed on February 21, 1991. In accordance with Technical Specification 4.4.5.2, an initial sample of steam generator tubes (shown on Figures 1 and 2) was selected and inspected. The results of this sample classified the steam generators in the C-1 category (Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective). An additional sample of 6392 tubes was inspected. Included within this sample was 100 percent Eddy Current Testing of all the tubes associated with the anti-vibration bar (AVB) wear regions in both the "B" and "D" steam generators. The intent of this augmented sample was to ensure the Unit 3 Eddy Current Program detects and monitors steam generator tube wall degradation and damage precursors. The complete results of the inspections are provided in Tables 1 through 3.

The complete inspection totaled 7101 bobbin probe tests (31% of the tubes in all 4 SGs) including 3555 tubes in steam generator "B" (63.2% of the tubes in 'B', shown on Figure 3) and 3546 tubes in "D" (63 % of the tubes in 'D', shown on Figure 5). All tubes except row 1 were run full length, tube end to tube end. The row one tubes were run from the hot leg tube end to the eighth tube support plate on the cold leg. The following are the summary results of the Eddy Current Inspections for each steam generator:

"B" Steam Generator

The most significant tube degradation was outside diameter flow induced vibrational wear, located at the SG AVBs. A total of five tubes examined (or 0.14 % of the tubes inspected) in the "B" SG were degraded, (i.e., exhibiting wear greater than 20 percent).

A small number of outer diameter indications not originating at an AVB were identified by this examination. Three tubes (0.08% of the tubes inspected in "B" SG) were identified by bobbin probe as having greater than 20% wall loss. They were low amplitude signals, which generally measure less than 30% through wall.

The data for all tubes degraded by 20 % or more is provided in Table 2. Figure 4 shows the location of all indications and plugged tubes within the 'B' steam generator.

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"D" Steam Generator

Again, most of the degradation was vibrational wear, which occurred at the AVB region. Of the 3546 tubes examined, 39 tubes were identified as degraded (experiencing damage 20% throughwall or greater). Of these 39 tubes, five (5) tubes (or 0.14% of the tubes inspected in "D" SG) had sufficient damage to be considered defective in accordance with the definitions stated in Technical Specification 4.4.5.4. These tubes, at locations R43-C42, R43-C103, R53-C86, R53-C88 and R53-C90 all contained wear type indications exceeding the plugging limit of 40% throughwall. In accordance with Technical Specifications these tubes were removed from service.

Two (2) additional tubes were identified with OD wall loss greater than 20% throughwall, not attributed to anti-vibration bar wear. One tube, R5-C1, which was identified with 30% through wall damage, had not changed since the preservice baseline examination. This indication was determined to be the result of either the installation or manufacturing process. Both tubes are identified in Table 3.

The total tubes examined in "D" steam Generator exhibiting degradation was 1.16%. All tubes having greater than 20% degradation are identified on Table 3 and Figure 6.

A limited number of steam generator tubes are exhibiting wall thickness degradation due to flow induced vibrational wear, typical of that experienced in most Westinghouse Model F Steam Generators. The wear is limited to row numbers greater than 20 on the periphery and greater than 30 in mid bundle (approximately). The flaws in mid bundle tend to be shallower than those on the periphery. AVB continues to be the only active damage mechanism affecting the MP-3 steam generators.

The licensee contact for this report is Larry Loomis, who may be reached at (203) 447-1791, Extension 5468.

Very truly yours,
NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace
Director, Millstone Station

SES/LL:ljs

Attachment

cc: T. T. Martin, Region I Administrator
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3

TABLE 1
MILLSTONE UNIT 3 END OF CYCLE 3
EDDY CURRENT BOBBIN RESULTS

Description	'B' SG	'D' SG	Total
Number of Tubes Examined	3555	3546	7101
Tubes With Flaw Indications			
Wall loss 1% to 19% TWD	5	33	38
Wall loss 20% to 39% TWD	8	41	49
Wall loss 40% to 100% TWD	0	5	5
Tubes With AVB Wear Indications			
Wall loss 1% to 19% TWD	1	26	27
Wall loss 20% to 39% TWD	5	39	44
Wall loss 40% to 100% TWD	0	5	5
Plugging			
Tubes Previously Plugged	3	2	5
Number of Tubes Plugged Subsequent to this inspection	0	5	5
Total Currently Plugged	3	7	10

TWD - Through Wall Depth

TABLE 2
DEGRADATION 20% THROUGH WALL OR GREATER
'B' STEAM GENERATOR

ROW	COL	INDICATION	%TW	VOLTS	LOCATION
41	34	WEAR	24	0.98	AV4 + 0.00
42	40	WEAR	24	0.93	AV4 + 0.00
45	56	ODI	25	1.03	07C + 38.30
51	88	ODI	26	0.67	07H + 29.26
52	86	WEAR	27	1.52	AV3 + 0.00
53	74	WEAR	26	1.48	AV1 + 0.00
58	76	WEAR	26	1.28	AV5 + 0.00
		WEAR	32	1.79	AV4 + 0.00
59	65	ODI	28	1.36	AV2 + 0.93

ODI - Outer Diameter Indication

TABLE 3
DEGRADATION 20% THROUGH WALL OR GREATER
'D' STEAM GENERATOR

ROW	COL	INDICATION	%TW	VOLTS	LOCATION
5	1	ODI	30	1.97	08H + 2.85
28	114	WEAR	26	1.10	AV1 + 0.00
28	115	WEAR	27	1.13	AV1 + 0.00
32	38	WEAR	20	0.81	AV5 + 0.00
33	21	ODI	28	0.48	07C + 20.70
36	45	WEAR	23	0.89	AV5 + 0.00
		WEAR	20	0.77	AV3 + 0.00
37	106	WEAR	21	0.77	AV4 + 0.00
40	99	WEAR	24	0.97	AV5 + 0.00
		WEAR	20	0.72	AV5 + 0.00
		WEAR	21	0.80	AV3 + 0.00
		WEAR	23	0.89	AV2 + 0.00
41	26	WEAR	25	1.06	AV5 + 0.00
41	51	WEAR	35	1.83	AV4 + 0.00
		WEAR	23	0.99	AV3 + 0.00
		WEAR	23	0.96	AV2 + 0.00
		WEAR	22	0.87	AV6 + 0.00
41	57	WEAR	26	1.13	AV5 + 0.00
		WEAR	26	1.16	AV3 + 0.00
42	100	WEAR	23	0.88	AV5 + 0.00
		WEAR	21	0.79	AV4 + 0.00
		WEAR	27	1.11	AV3 + 0.00
41	101	WEAR	20	0.76	AV2 + 0.00
42	102	WEAR	27	1.1[illegible]	[illegible]V5 + 0.00
		WEAR	21	0.7[illegible]	AV4 + 0.00
43	23	WEAR	22	0.92	AV5 + 0.00
43	42	WEAR	22	0.90	AV6 + 0.00
		WEAR	41	2.46	AV5 + 0.00
		WEAR	38	2.18	AV4 + 0.00
		WEAR	23	0.95	AV3 + 0.00
43	58	WEAR	23	0.97	AV4 + 0.00
43	69	WEAR	22	0.82	AV5 + 0.00
		WEAR	23	0.89	AV4 + 0.00
		WEAR	26	1.09	AV3 + 0.00
43	75	WEAR	20	0.75	AV5 + 0.00

TABLE 3 (Continued)
DEGRADATION 20% THROUGH WALL OR GREATER
'D' STEAM GENERATOR

ROW		COL	INDICATION	%TW	VOLTS	LOCATION
			WEAR	22	0.83	AV4 + 0.00
43		91	WEAR	28	1.18	AV2 + 0.00
43	*	103	WEAR	24	1.05	AV6 + 0.00
			WEAR	31	1.49	AV5 + 0.00
			WEAR	41	2.45	AV4 + 0.00
			WEAR	42	2.59	AV3 + 0.00
			WEAR	35	1.85	AV2 + 0.00
47		99	WEAR	24	0.97	AV6 + 0.00
48		95	WEAR	31	1.47	AV5 + 0.00
			WEAR	29	1.31	AV3 + 0.00
48		96	WEAR	22	0.94	AV5 + 0.00
49		66	WEAR	20	0.74	AV2 + 0.00
51		45	WEAR	34	1.76	AV6 + 0.00
			WEAR	27	1.17	AV5 + 0.00
			WEAR	28	1.24	AV4 + 0.00
			WEAR	26	1.13	AV3 + 0.00
51		46	WEAR	22	0.88	AV6 + 0.00
			WEAR	31	1.45	AV4 + 0.00
			WEAR	25	1.04	AV2 + 0.00
51		68	WEAR	21	0.83	AV6 + 0.00
			WEAR	24	1.03	AV4 + 0.00
51		81	WEAR	29	1.37	AV4 + 0.00
			WEAR	28	1.26	AV5 + 0.00
52		70	WEAR	21	0.84	AV5 + 0.00
			WEAR	24	1.01	AV4 + 0.00
			WEAR	29	1.32	AV3 + 0.00
			WEAR	23	0.98	AV2 + 0.00
52		89	WEAR	32	1.54	AV4 + 0.00
			WEAR	26	1.14	AV3 + 0.00
52		90	WEAR	25	1.07	AV5 + 0.00
			WEAR	32	1.61	AV4 + 0.00
			WEAR	34	1.78	AV2 + 0.00
53	*	86	WEAR	48	3.58	AV5 + 0.00
			WEAR	43	2.72	AV4 + 0.00

TABLE 3 (Continued)
DEGRADATION 20% THROUGH WALL OR GREATER
'D' STEAM GENERATOR

ROW		COL	INDICATION	%TW	VOLTS	LOCATION
			WEAR	53	4.71	AV3 + 0.00
			WEAR	24	1.03	AV2 + 0.00
53	*	88	WEAR	41	2.45	AV5 + 0.00
			WEAR	39	2.20	AV4 + 0.00
			WEAR	34	1.73	AV3 + 0.00
53	*	90	WEAR	24	1.02	AV6 + 0.00
			WEAR	24	1.00	AV5 + 0.00
			W	47	3.28	AV4 + 0.00
			WEAR	40	2.33	AV3 + 0.00
			WEAR	35	1.83	AV2 + 0.00
			WEAR	20	0.79	AV1 + 0.00
54		88	WEAR	37	2.01	AV6 + 0.00
			WEAR	21	0.89	AV4 + 0.00
55		63	WEAR	37	2.00	AV6 + 0.00
			WEAR	31	1.50	AV5 + 0.00
			WEAR	32	1.58	AV4 + 0.00
			WEAR	32	1.58	AV3 + 0.00
			WEAR	21	0.89	AV2 + 0.00
55		70	WEAR	24	1.05	AV5 + 0.00
57		57	WEAR	20	0.79	AV2 + 0.00
57		78	WEAR	20	0.82	AV4 + 0.00
			WEAR	22	0.89	AV3 + 0.00
			WEAR	22	0.88	AV2 + 0.00

* Tubes Plugged during this Refueling Outage

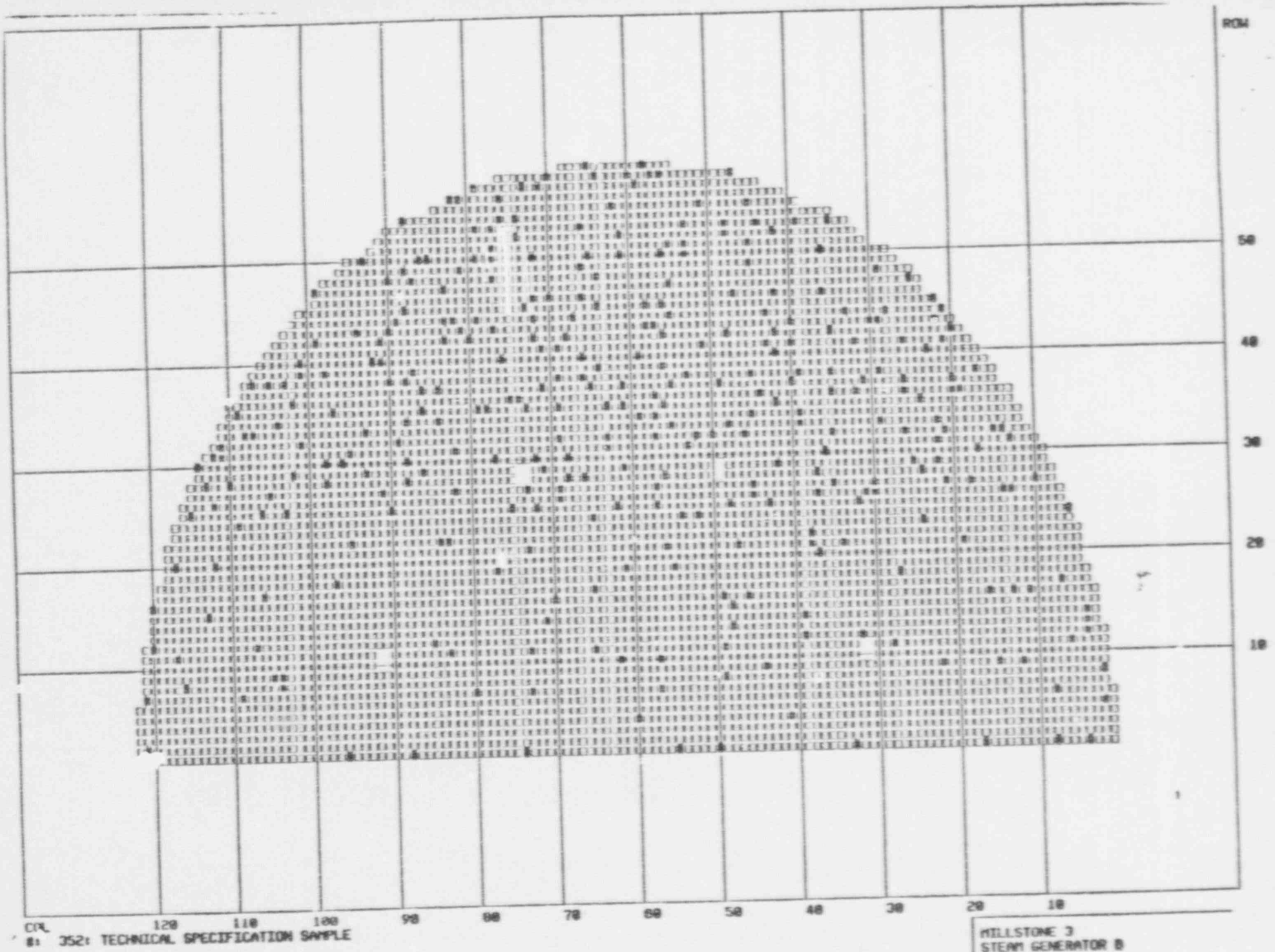


FIGURE 1 --Technical Specification Sample

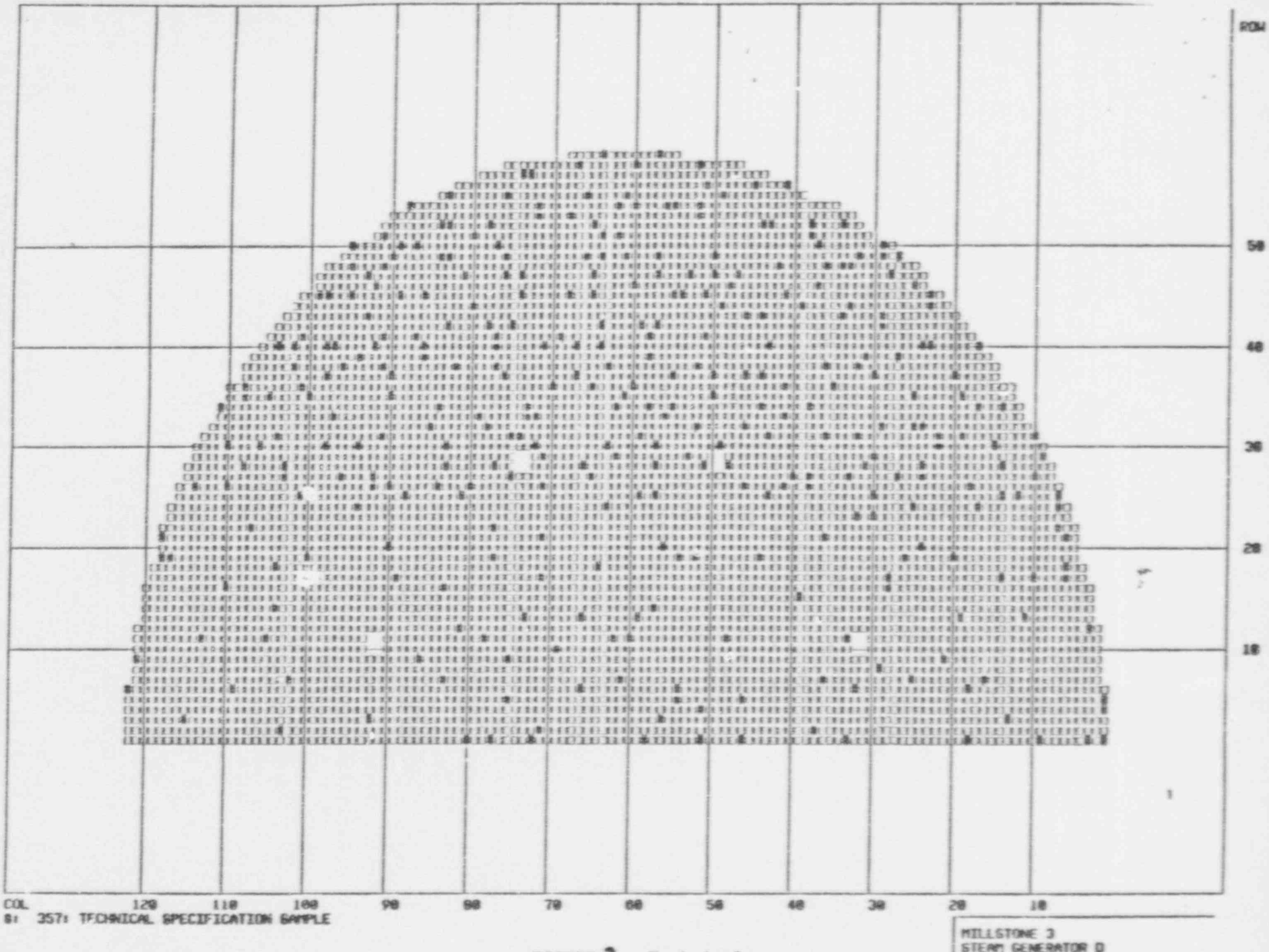


FIGURE 2 --Technical Specification Sample

Figure -

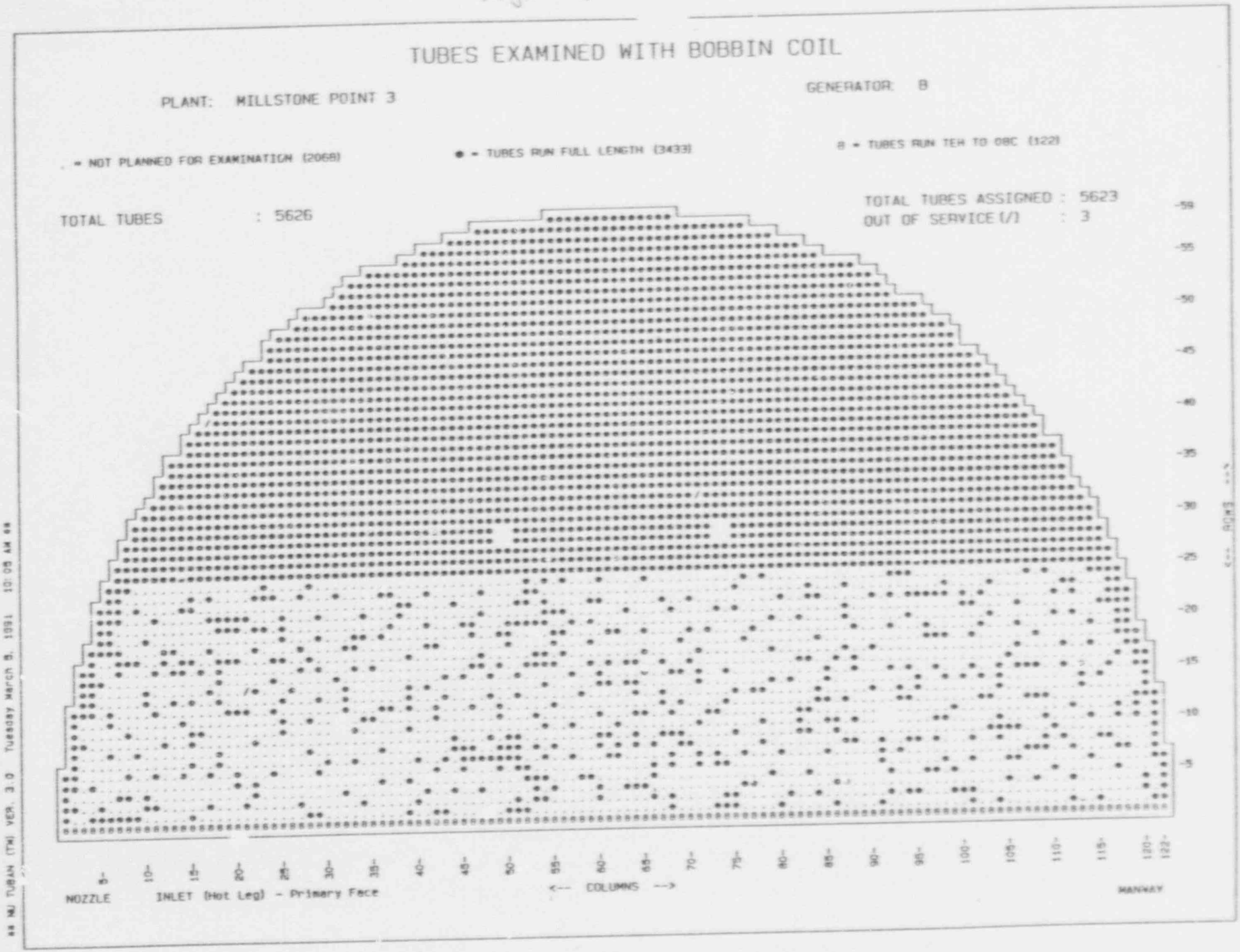

TUBES EXAMINED WITH BOBBIN COIL
PLANT: MILLSTONE POINT 3
GENERATOR: B
- = NOT PLANNED FOR EXAMINATION (2068)
● = TUBES RUN FULL LENGTH (3433)
8 = TUBES RUN TEH TO OBC (122)
TOTAL TUBES : 5626
TOTAL TUBES ASSIGNED : 5623
OUT OF SERVICE (/) : 3
NOZZLE
INLET (Hot Leg) - Primary Face
<-- COLUMNS -->
MANWAY
** NU TUBAN (TM) VER. 3.0 Tuesday March 5, 1991 10:05 AM **

Figure 4

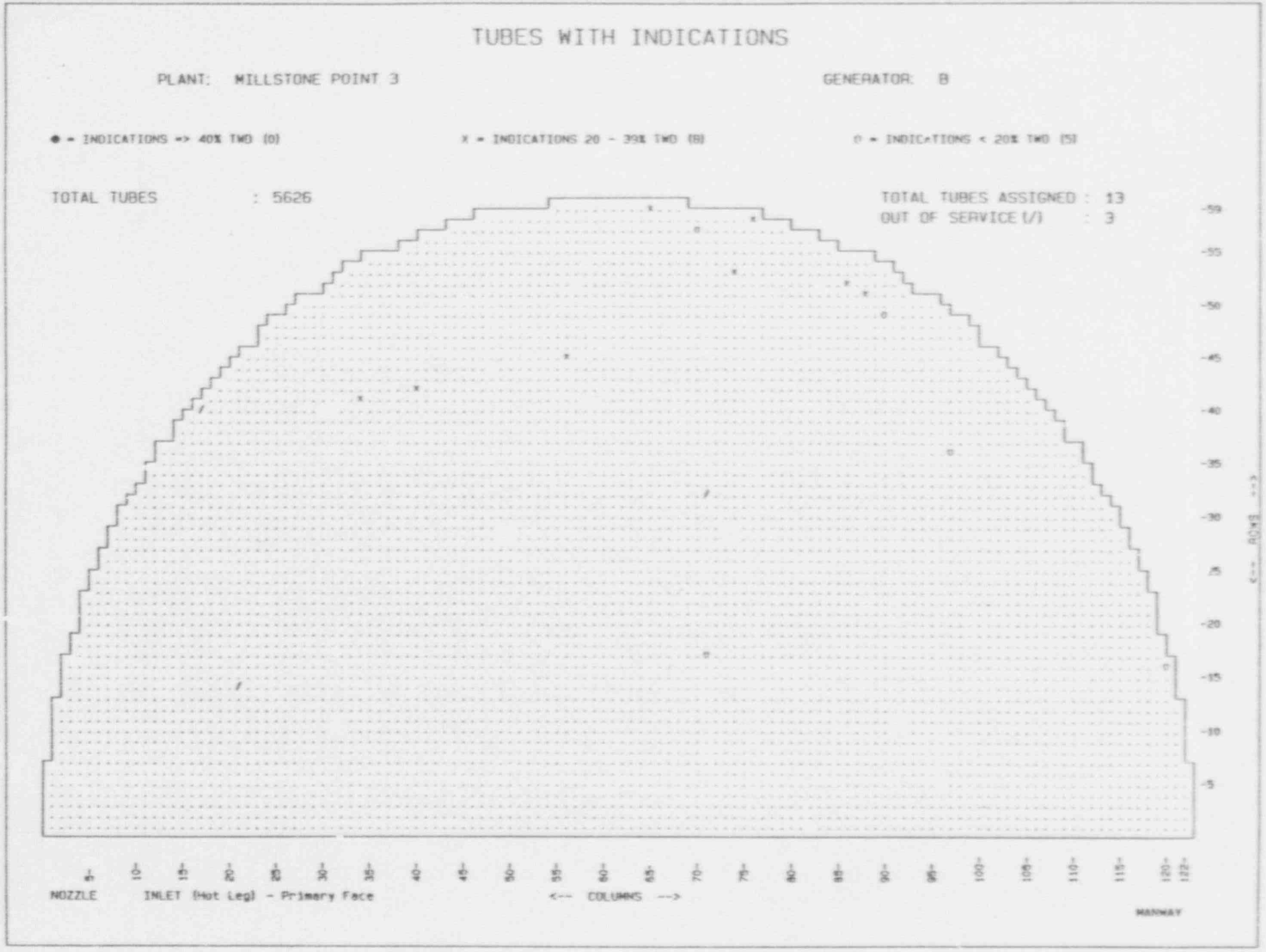

TUBES WITH INDICATIONS
PLANT: MILLSTONE POINT 3
GENERATOR: B
● = INDICATIONS => 40% TWD (0)
X = INDICATIONS 20 - 39% TWD (8)
o = INDICATIONS < 20% TWD (5)
TOTAL TUBES : 5626
TOTAL TUBES ASSIGNED : 13
OUT OF SERVICE (/) : 3
NOZZLE
INLET (Hot Leg) - Primary Face
<-- COLUMNS -->
MANWAY
<-- ROWS -->

Figure 5

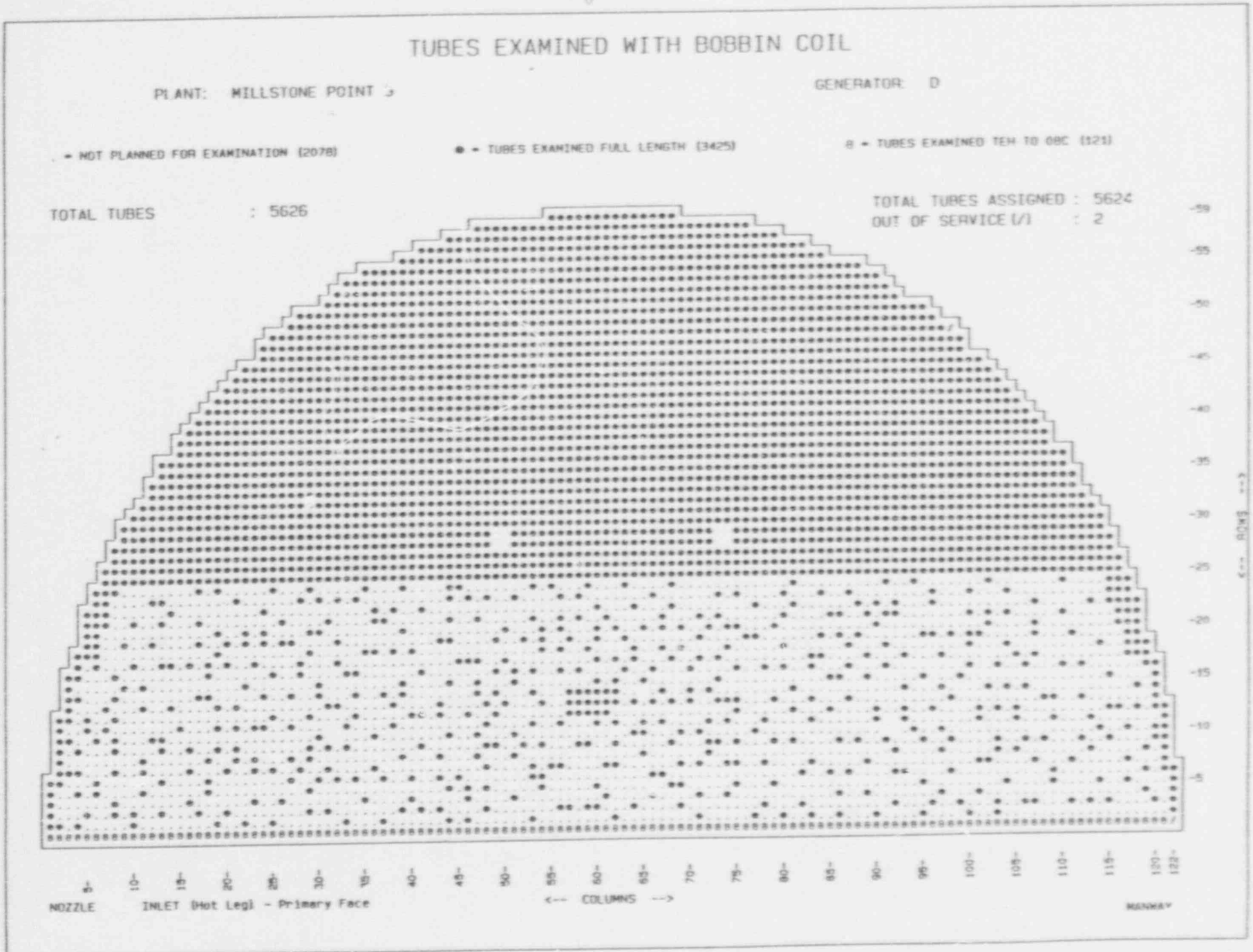
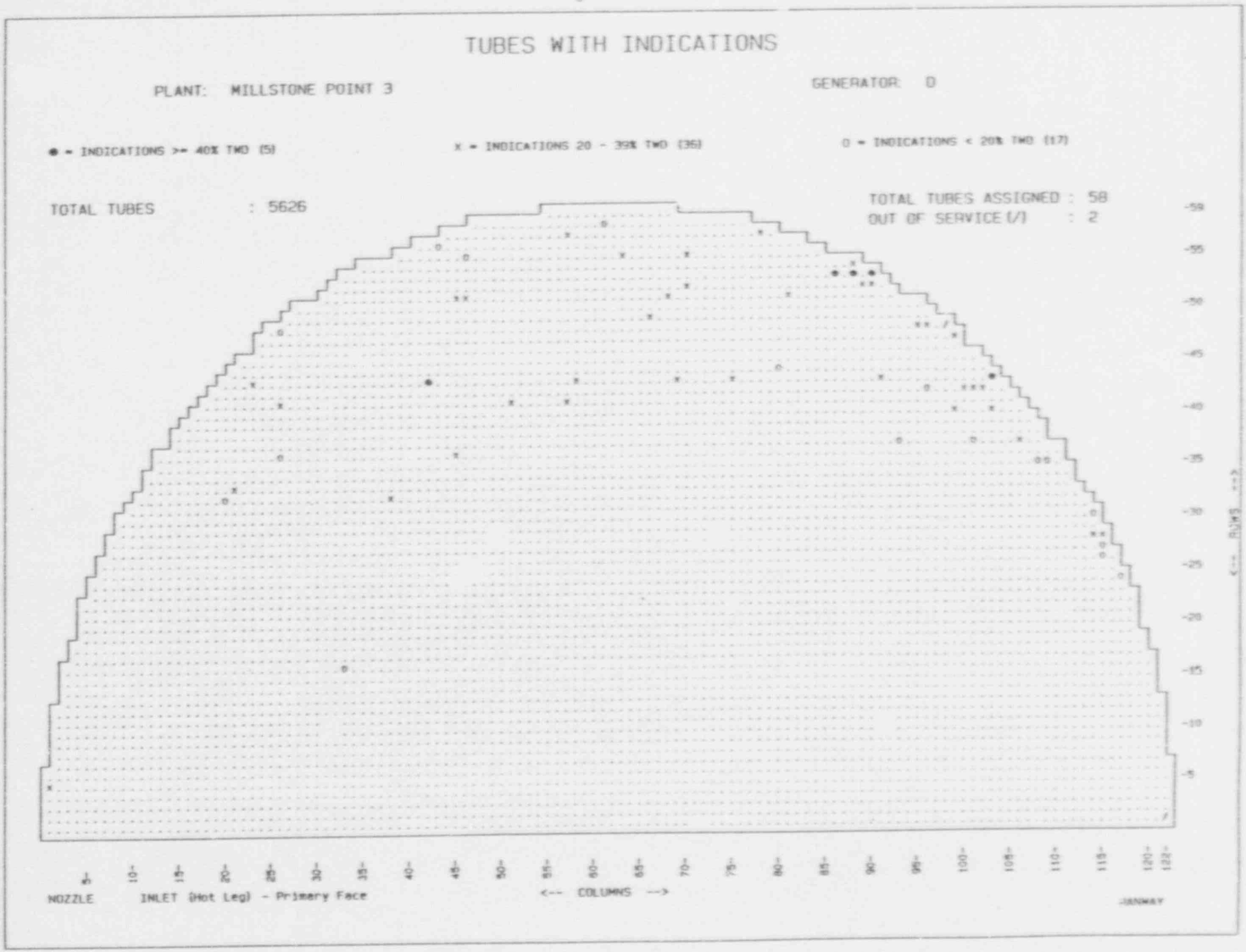

TUBES EXAMINED WITH BOBBIN COIL
PLANT: MILLSTONE POINT 3
GENERATOR: D
. = NOT PLANNED FOR EXAMINATION (2078)
● = TUBES EXAMINED FULL LENGTH (3425)
8 = TUBES EXAMINED TEH TO 08C (121)
TOTAL TUBES : 5626
TOTAL TUBES ASSIGNED : 5624
OUT OF SERVICE (/) : 2
<-- ROWS -->
NOZZLE
INLET (Hot Leg) - Primary Face
<-- COLUMNS -->
MIRROR
** NU TUBAN (TM) VER. 3.0 Tuesday March 5, 1991 10:00 AM **

Figure 6


TUBES WITH INDICATIONS
PLANT: MILLSTONE POINT 3
GENERATOR: D
● = INDICATIONS >= 40% TWD (5)
X = INDICATIONS 20 - 39% TWD (36)
O = INDICATIONS < 20% TWD (17)
TOTAL TUBES : 5626
TOTAL TUBES ASSIGNED : 58
OUT OF SERVICE (/) : 2
<-- ROWS -->
NOZZLE
INLET (Hot Leg) - Primary Face
<-- COLUMNS -->
JENWAY
** MU TUBAN (TM) VER. 3.0 Monday March 11, 1991 10:01 AM **