

ATTACHMENT 1

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION UNIT 1

1995 ANNUAL STEAM GENERATOR
INSERVICE INSPECTION REPORT

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Q PDR

ATTACHMENT 1

**SURRY UNIT 1, SEPTEMBER 1995 RFO
S/G "C", EDDY CURRENT EXAMINATION SUMMARY**

In Steam Generator "C", all available tubes were inspected full length with bobbin probes. A 301 tube sample was tested with Rotating Pancake Coil (RPC) probes in the hot leg transition (TSH +/- 3") region. Supplemental examinations were also performed using RPC probes where additional confirmatory or other data was desired. Tube R38-C74 was plugged as a precautionary measure. This Steam Generator contains a total of five plugged tubes. All NQI and NQN calls were resolved by RPC examination or history review. Bobbin signals greater than 20% throughwall may also have been subjected to further resolution by either of these methods. See the attached list for details.

ATTACHMENT 1

SURRY 1, 1995 REFUELING OUTAGE
STEAM GENERATOR "C"

ROW	COL	LOCN	IND	REMARKS
31	13	AV4	10	
32	15	5C	17	
13	16	6H	11	
35	17	6H	18	
22	18	4H	18	
33	18	3C	19	
10	23	4H	16	
31	23	4H	19	
9	24	3C	12	
39	25	1C	13	
40	26	6C	13	
31	27	5H	12	
35	28	4C	11	
21	33	1C	11	
42	33	6C	11	
36	35	4C	12	
14	38	6H	11	
31	38	4C	16	
16	41	2H	12	
45	44	1C	17	
46	44	AV4	10	
13	45	2C	10	

ATTACHMENT 1

**SURRY 1, 1995 REFUELING OUTAGE
STEAM GENERATOR "C"**

ROW	COL	LOCN	IND	REMARKS
35	46	AV3	13	
6	47	2C	19	
34	47	5H	12	
19	52	TSC	19	
35	52	5H	16	
35	52	1C	13	
19	54	4C	13	
10	56	2C	17	
45	56	2C	15	
11	57	TSC	18	
13	58	4C	17	
4	60	3C	17	
27	60	4H	17	
28	60	BPH	37	
34	60	AV1	16	
34	60	AV2	11	
34	60	AV3	14	
27	65	BPC	12	
39	69	AV3	17	
14	72	4C	14	
17	72	BPC	14	
26	72	6C	11	
23	73	BPH	20	

ATTACHMENT 1

**SURRY 1, 1995 REFUELING OUTAGE
STEAM GENERATOR "C"**

ROW	COL	LOCN	IND	REMARKS
38	74	AV2	14	plugged *
38	74	AV3	17	plugged *
38	74	AV4	29	plugged *
1	75	TSC	12	
37	75	AV3	12	
37	75	4C	16	
14	76	2C	19	
30	83	TSC	19	
25	84	6H	19	
25	84	6C	18	
17	87	2C	17	
1	91	1H	11	
13	92	6C	13	

* Preventively plugged

ATTACHMENT 2

**VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 1
TUBESHEET MAPS**

SG - C BOBBIN COMPLETED EXTENTS - H/L

Surry Unit 1

VPA-C SERIES 51F

11-08-1995

09:10 HRS.

SUPERTUBIN

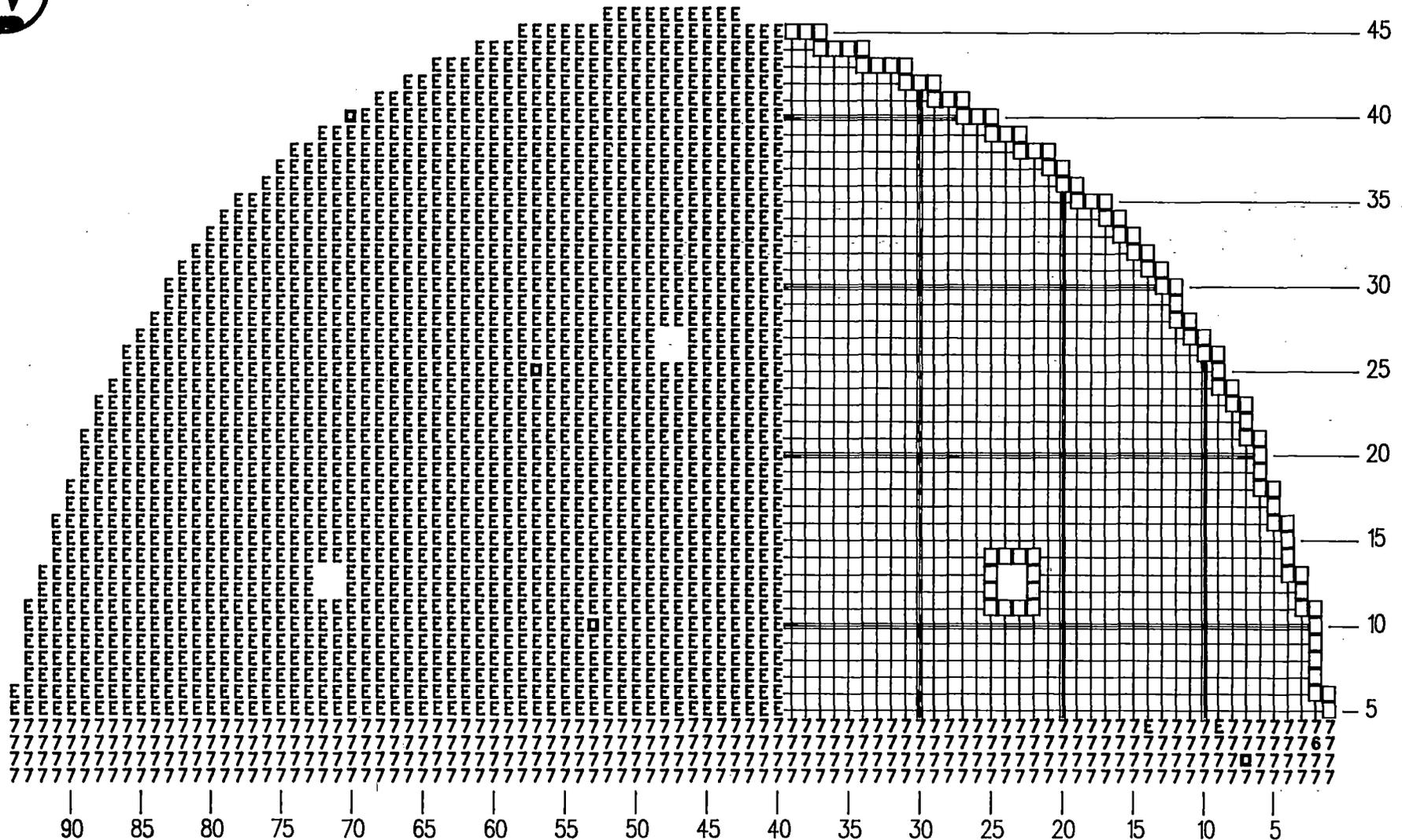
7 : 281 TESTED 7H THRU TEH
 7 : 91 TESTED 7C THRU TEH
 6 : 1 TESTED 6C THRU TEH

E : 1813 TESTED FULL LENGTH

□ : 4 PLUGGED TUBE



ATTACHMENT 2



SG - C BOBBIN COMPLETED EXTENTS - C/L

Surry Unit 1

VPA-C SERIES 51F

11-08-1995

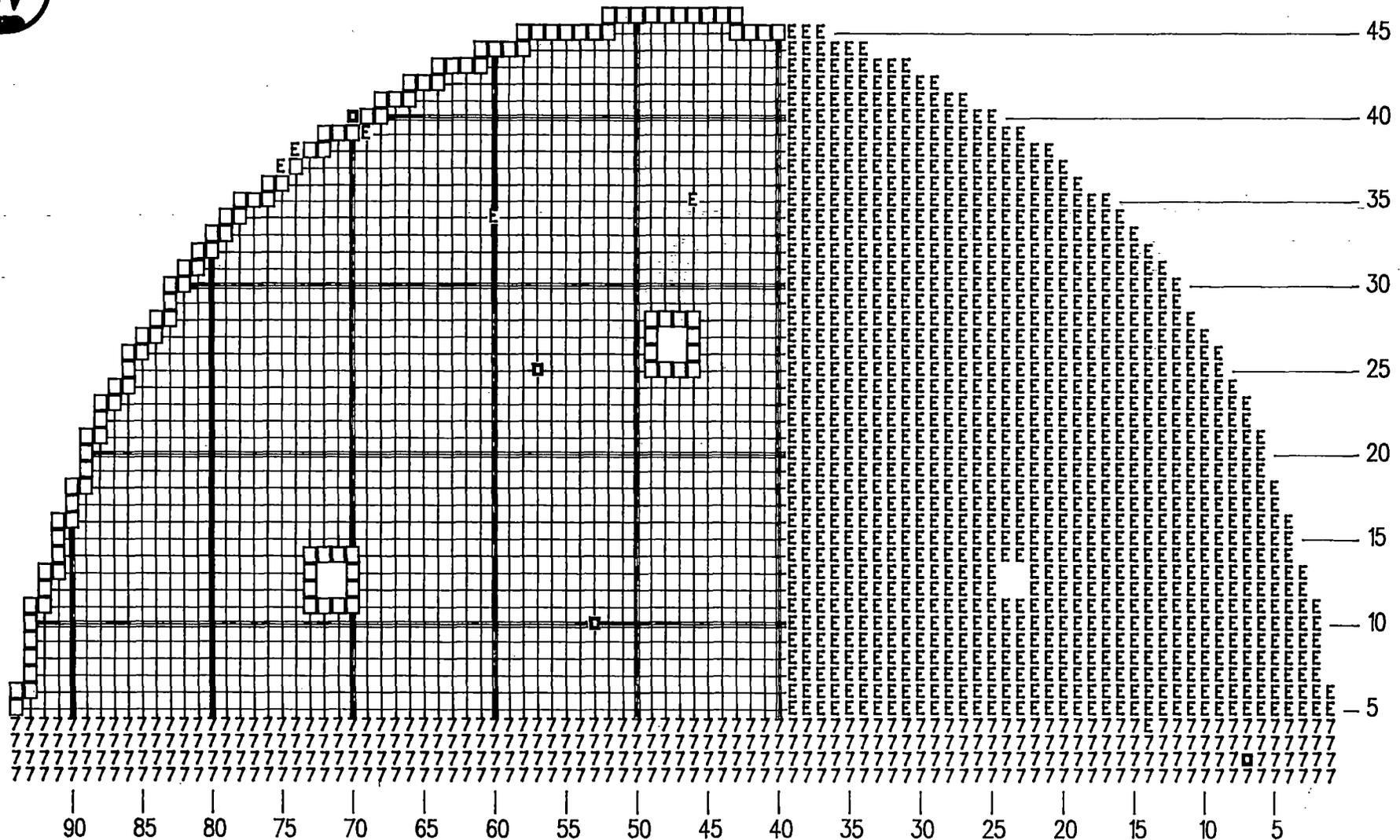
09:18 HRS.

SUPERTUBIN

- 7 : 278 TESTED 7C THRU TEC
- 7 : 96 TESTED 7H THRU TEC
- E : 1158 TESTED FULL LENGTH
- ☐ : 4 PLUGGED TUBE



ATTACHMENT 2



SG C - INDICATION DISTRIBUTION - HOT LEG

Surry Unit 1

VPA-C SERIES 51F

11-09-1995

10:05 HRS.

SUPERTUBIN

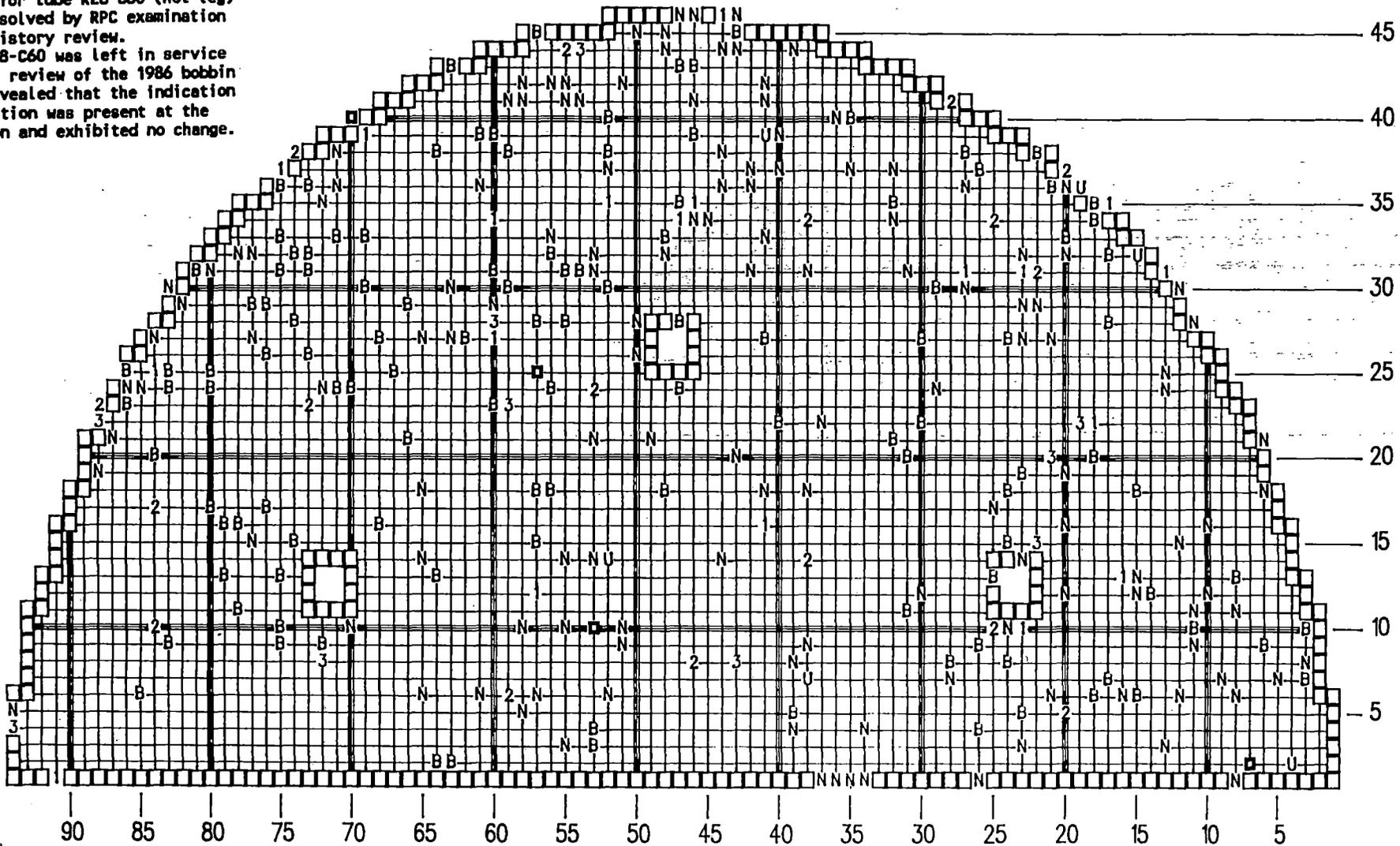
U : 6 UDS - DISTORTED SIGNAL
 B : 120 MANUFACTURING BUFF MARK
 N : 138 NQN - NQI NOT RPC CONFIRMED

1 : 19 <20% INDICATION
 2 : 17 20-29% INDICATION
 3 : 10 30-39% INDICATION

☐ : 4 PLUGGED TUBE

All bobbin signals >20% through wall including NQI,s and NQN,s except for tube R28-C60 (hot leg) were resolved by RPC examination of history review. R28-C60 was left in service after a review of the 1986 bobbin data revealed that the indication in question was present at the location and exhibited no change.

ATTACHMENT 2



SG C INDICATION DISTRIBUTION - COLD LEG

Surry Unit 1

VPA-C SERIES 51F

11-09-1995

10:12 HRS.

SUPERTUBIN

- R : 1 INDICATION NOT REPORTABLE
- U : 6 UDS - DISTORTED SIGNAL
- B : 122 MANUFACTURING BUFF MARK
- N : 118 NQN - NQI NOT RPC CONFIRMED
- S : 1 DSI - DISTORTED INDICATION

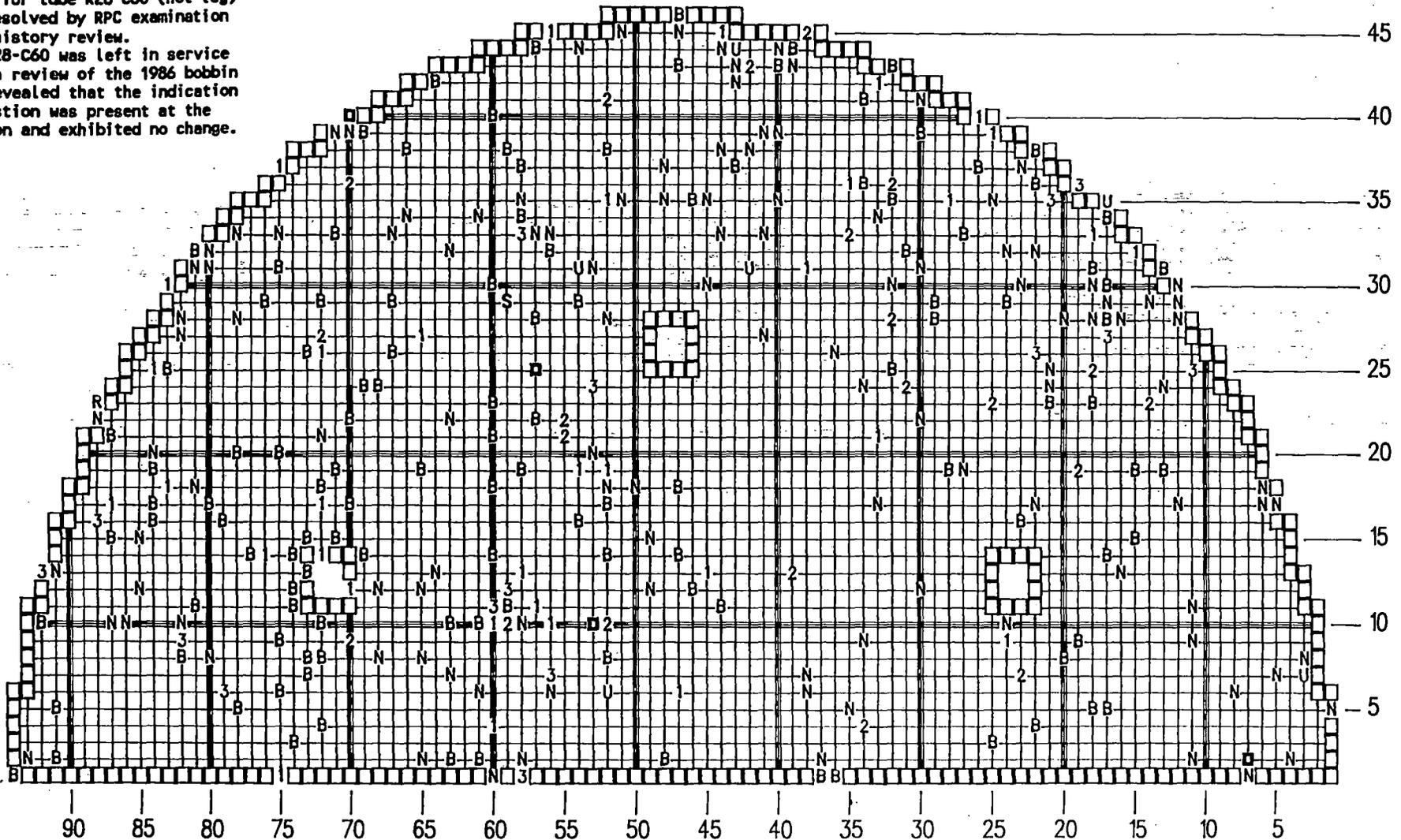
- 1 : 34 <20% INDICATION
- 2 : 21 20-29% INDICATION
- 3 : 15 30-39% INDICATION

☐ : 4 PLUGGED TUBE

All bobbin signals >20% through wall including NQI,s and NQN,s except for tube R28-C60 (hot leg) were resolved by RPC examination or by history review.

R28-C60 was left in service for a review of the 1986 bobbin data revealed that the indication in question was present at the location and exhibited no change.

ATTACHMENT 2



SG C - UPDATED TOTAL PLUGGED TUBES

□ : 5 TUBE PLUGGED

Surry Unit 1

VPA-C SERIES 51F

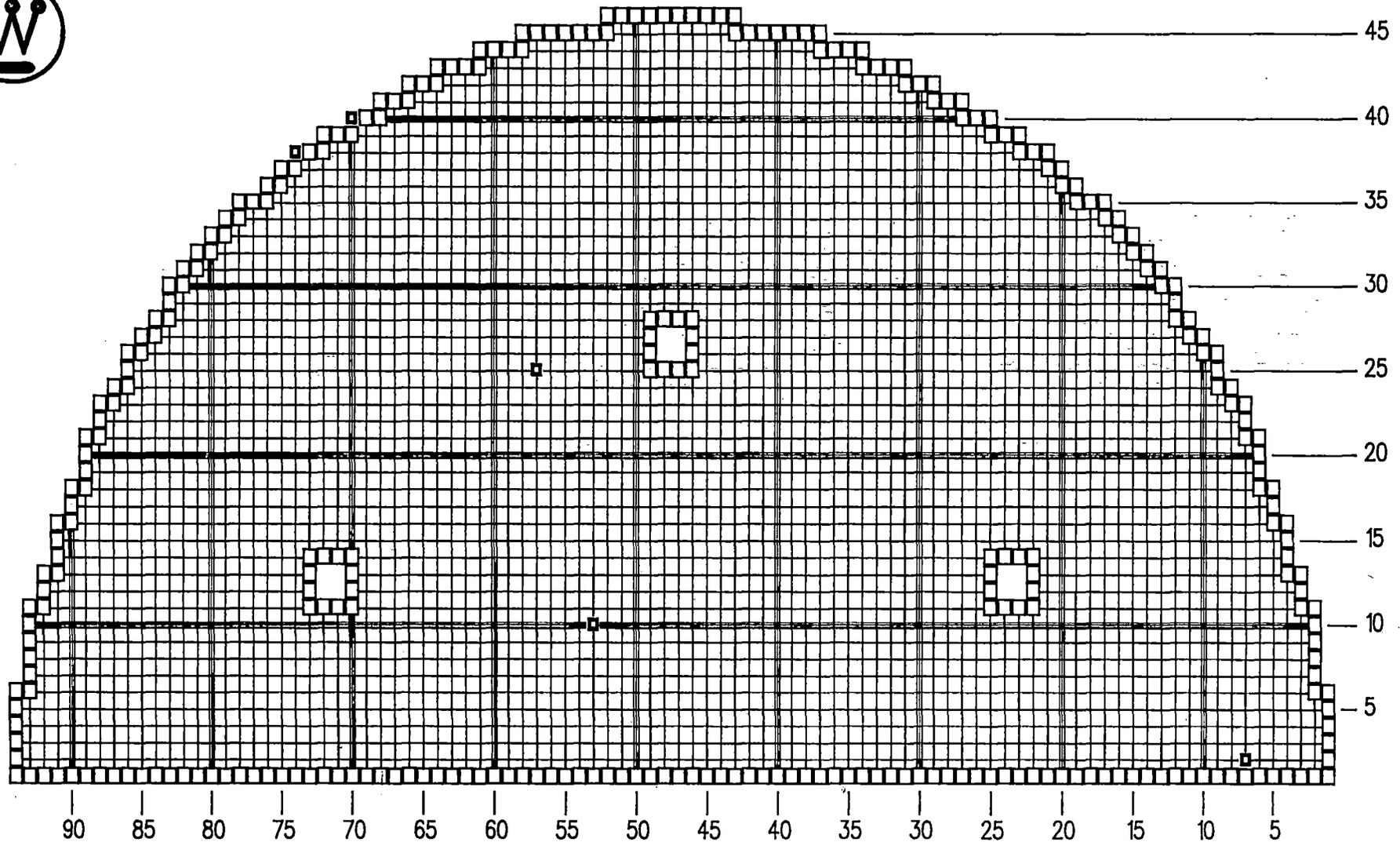
12-11-1995

10:45 HRS.

SUPERTUBIN



ATTACHMENT 2



ATTACHMENT 3

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION UNIT 2

**1995 ANNUAL STEAM GENERATOR
INSERVICE INSPECTION REPORT**

ATTACHMENT 3

SURRY UNIT 2, FEBRUARY 1995 RFO
S/G "A", EDDY CURRENT EXAMINATION SUMMARY

In Steam Generator "A", all available tubes were inspected full length with bobbin probes. A 301 tube sample was tested with Rotating Pancake Coil (RPC) probes in the hot leg transition (TSH +/- 3") region. Supplemental examinations were also performed using RPC probes where additional confirmatory or other data was desired. All NQI and NQN calls were resolved by RPC examination or history review. Bobbin signals greater than 20% throughwall may also have been subjected to further resolution by either of these methods. The following tubes were plugged for axially oriented indications:

<u>Row</u>	<u>Column</u>
4	36
6	39
7	39
7	50

Tube R1-C59 was plugged as a precautionary measure due to a restriction at the tubesheet on the hot leg. This Steam Generator contains a total of seven plugged tubes. See the attached list for details.

ATTACHMENT 3

**SURRY 2, 1995 REFUELING OUTAGE
STEAM GENERATOR "A"**

ROW	COL	LOCN	IND	REMARKS
18	5	2C	15	
8	6	5H	10	
24	9	4H	11	
19	14	5C	14	
7	19	4H	15	
9	19	6H	11	
31	20	4C	12	
27	26	3C	14	
31	26	TSH	10	
6	27	3C	14	
38	27	AV3	15	
2	28	TSC	11	
27	29	3C	13	
28	29	2H	17	
20	30	6H	15	
2	33	6H	14	
23	34	6H	10	
29	34	AV4	17	
1	35	2C	13	
6	35	2C	17	
9	35	TSC	17	
13	35	4H	10	
13	35	6H	18	

ATTACHMENT 3

**SURRY 2, 1995 REFUELING OUTAGE
STEAM GENERATOR "A"**

ROW	COL	LOCN	IND	REMARKS
19	35	7H	14	
4	36	TSC	37	plugged
4	36	TSC	SAI	plugged
9	36	6H	16	
4	37	TSC	14	
23	37	7H	18	
6	39	TSC	MAI	plugged
7	39	TSC	SAI	plugged
21	41	6H	13	
19	45	AV4	17	
35	47	2C	14	
19	49	7C	16	
46	49	BPH	18	
7	50	TSC	MAI	plugged
31	50	1H	19	
9	51	TSC	16	
10	52	5C	16	
35	55	2C	12	
36	55	AV4	17	
43	55	AV2	15	
36	56	AV4	16	
38	56	6C	14	
4	57	2H	12	

ATTACHMENT 3

**SURRY 2, 1995 REFUELING OUTAGE
STEAM GENERATOR "A"**

<u>ROW</u>	<u>COL</u>	<u>LOCN</u>	<u>IND</u>	<u>REMARKS</u>
7	57	2H	13	
7	57	TSC	11	
21	57	TSH	16	
25	57	AV2	16	
36	57	AV4	18	
17	58	6C	12	
1	59	TSC	28	plugged *
1	59	TEH	RST	plugged *
1	59	TSH	RST	plugged *
3	59	3H	12	
16	61	1C	14	
19	62	6H	13	
30	62	4H	16	
36	62	AV2	12	
40	65	AV2	18	
8	66	1H	18	
11	66	6C	14	
8	67	1C	14	
24	68	7H	19	
32	68	AV3	19	
32	69	4H	14	
24	70	4C	19	
23	72	BPC	14	
31	72	3C	17	

ATTACHMENT 3

**SURRY 2, 1995 REFUELING OUTAGE
STEAM GENERATOR "A"**

ROW	COL	LOCN	IND	REMARKS
38	72	AV4	17	
12	73	6C	16	
12	73	1C	16	
16	74	2C	19	
22	77	4H	12	
24	77	4C	19	
6	78	1C	10	
1	79	5H	18	
27	80	4H	15	
8	82	4C	13	
3	83	BPH	13	
21	83	1C	19	
25	85	6C	10	
1	86	2C	14	
26	86	AV3	19	
4	88	6H	17	
12	88	TSH	11	
6	89	2C	19	

* - Plugged as a precautionary measure

ATTACHMENT 4

**VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 2
TUBESHEET MAPS**

VIR - A COMPLETED BOBBIN EXTENTS

COLD LEG
Surry Unit 2

VIR-A SERIES 51F

02-20-1995

12:20 HRS.

SUPERTUBIN

7 : 96 TESTED 7C THRU TEC

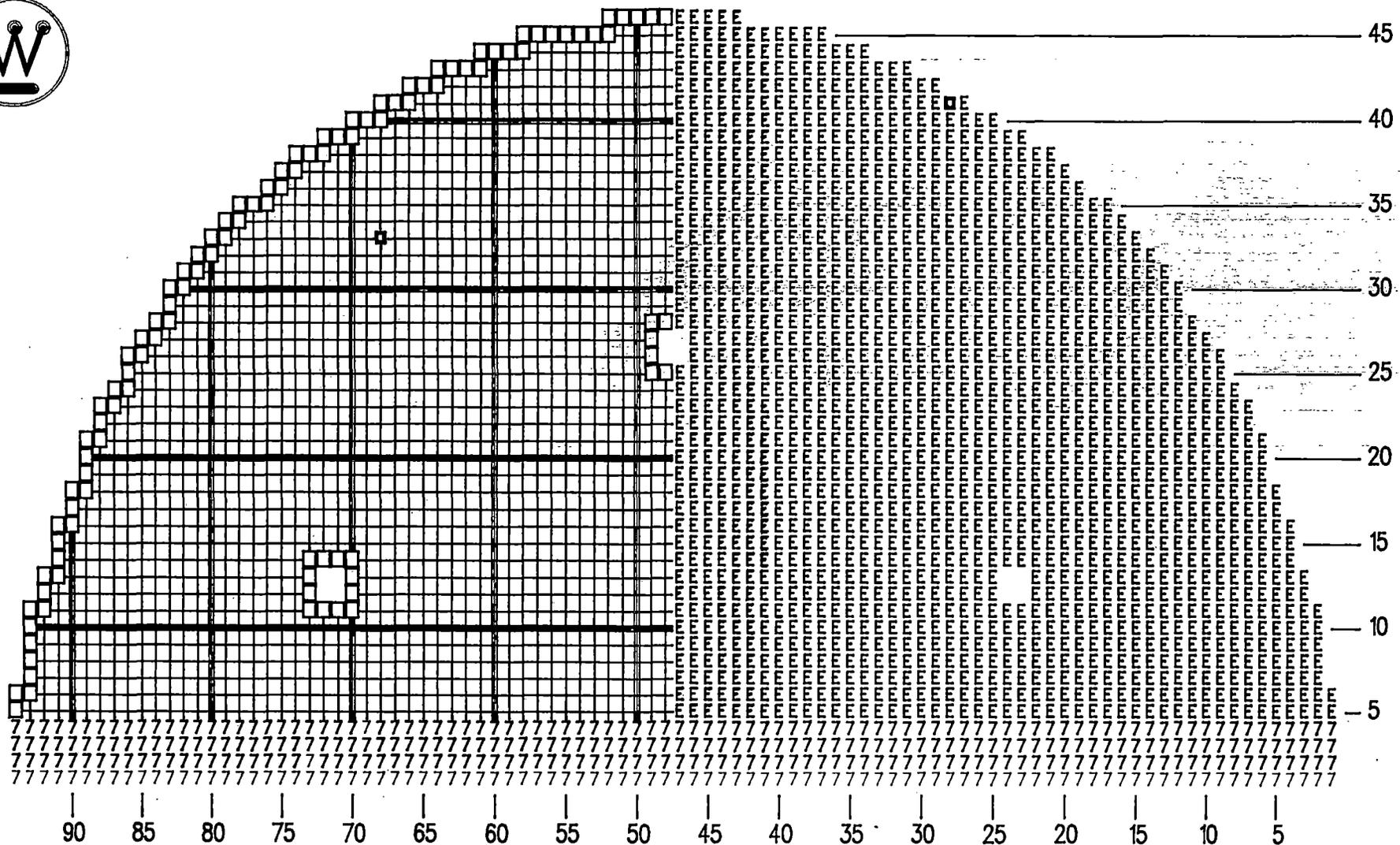
7 : 280 TESTED 7H THRU TEC

E : 1482 TESTED FULL LENGTH (TEH - TEC)

□ : 2 PLUGGED TUBE



ATTACHMENT 4



VIR - A COMPLETED BOBBIN EXTENTS

HOT LEG
Surry Unit 2

VIR-A SERIES 51F

02-20-1995

12:24 HRS.

SUPERTUBIN

7 : 271 TESTED 7H THRU TEH

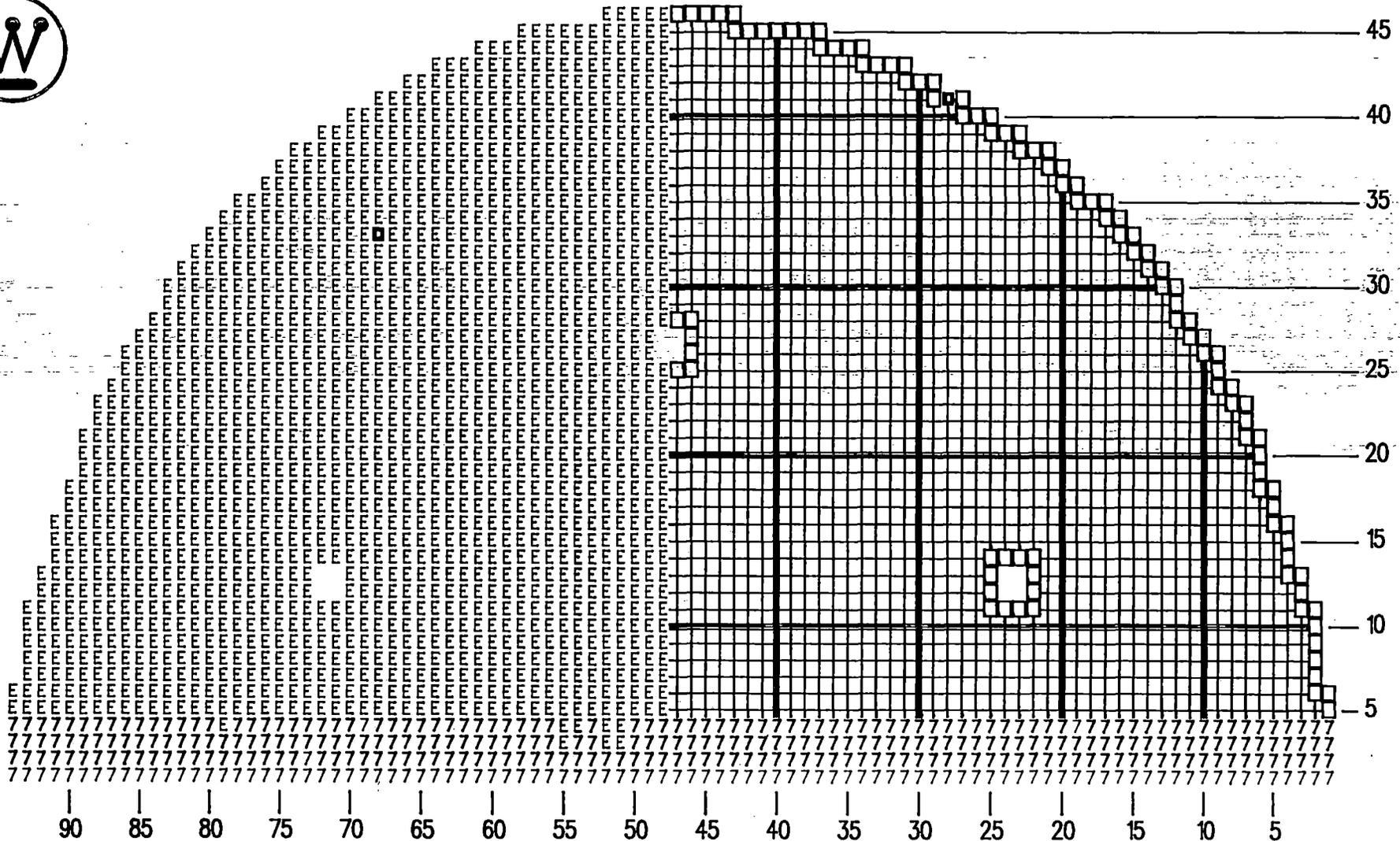
7 : 97 TESTED 7C THRU TEH

E : 1490 TESTED FULL LENGTH (TEC - TEH)

□ : 2 PLUGGED TUBE



ATTACHMENT 4



VIR - A TOP OF TUBESHEET RPC PLAN

HOT LEG

Surry Unit 2

VIR-A SERIES 51F

PATTERNED TUBE SELECTION

02-20-1995

12:18 HRS.

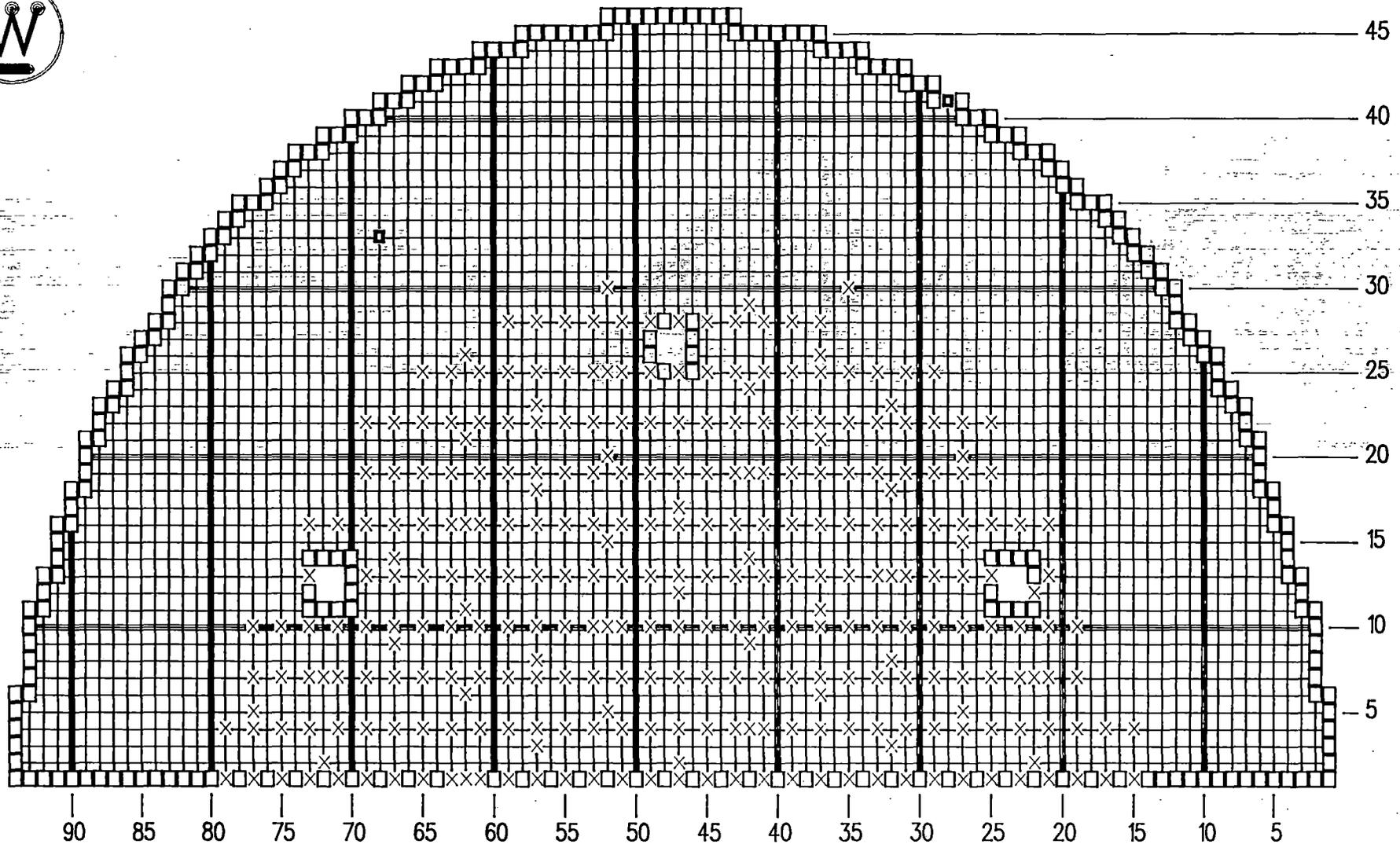
SUPERTUBIN

× : 301 RPC TEST TSH +/- 3"

□ : 2 PLUGGED TUBE



ATTACHMENT 4



VIR - A INDICATION DISTRIBUTION MAP

HOT LEG
Surry Unit 2

VIR-A SERIES 51F

02-21-1995 14:31 HRS. SUPERTUBIN

Q : 120 NQI INDICATION
U : 4 UDS INDICATION

1 : 38 1 - 19% INDICATION
2 : 16 20 - 29% INDICATION
3 : 6 30 - 39% INDICATION

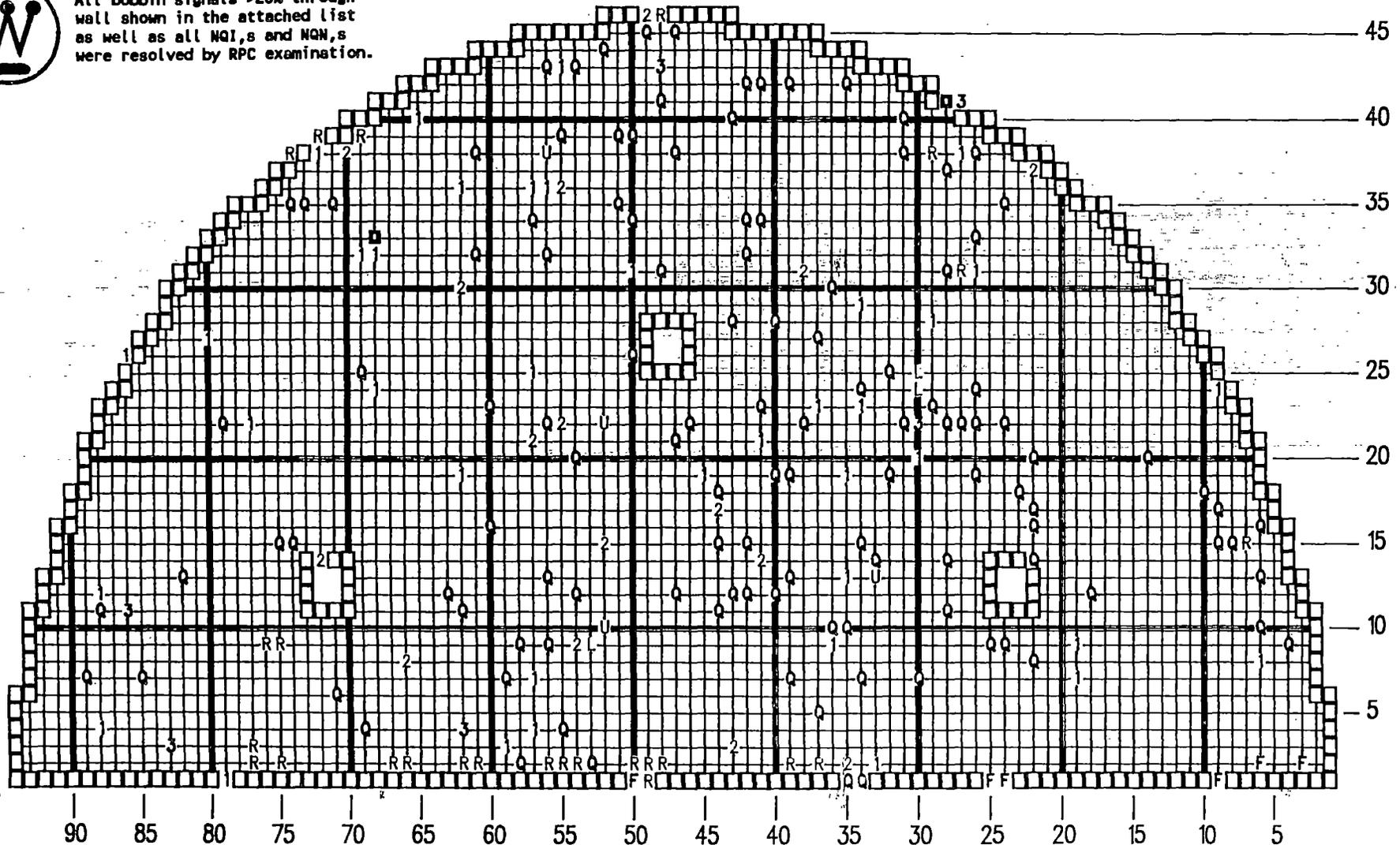
L : 3 POSSIBLE LOOSE PART INDICATION
F : 6 INDICATION NOT FOUND
R : 25 INDICATION NOT REPORTABLE

■ : 2 PLUGGED TUBE



All bobbin signals >20% through wall shown in the attached list as well as all NQI,s and NQN,s were resolved by RPC examination.

ATTACHMENT 4



VIR - A INDICATION DISTRIBUTION MAP

COLD LEG
Surry Unit 2

VIR-A SERIES 51F

02-21-1995

14:25 HRS.

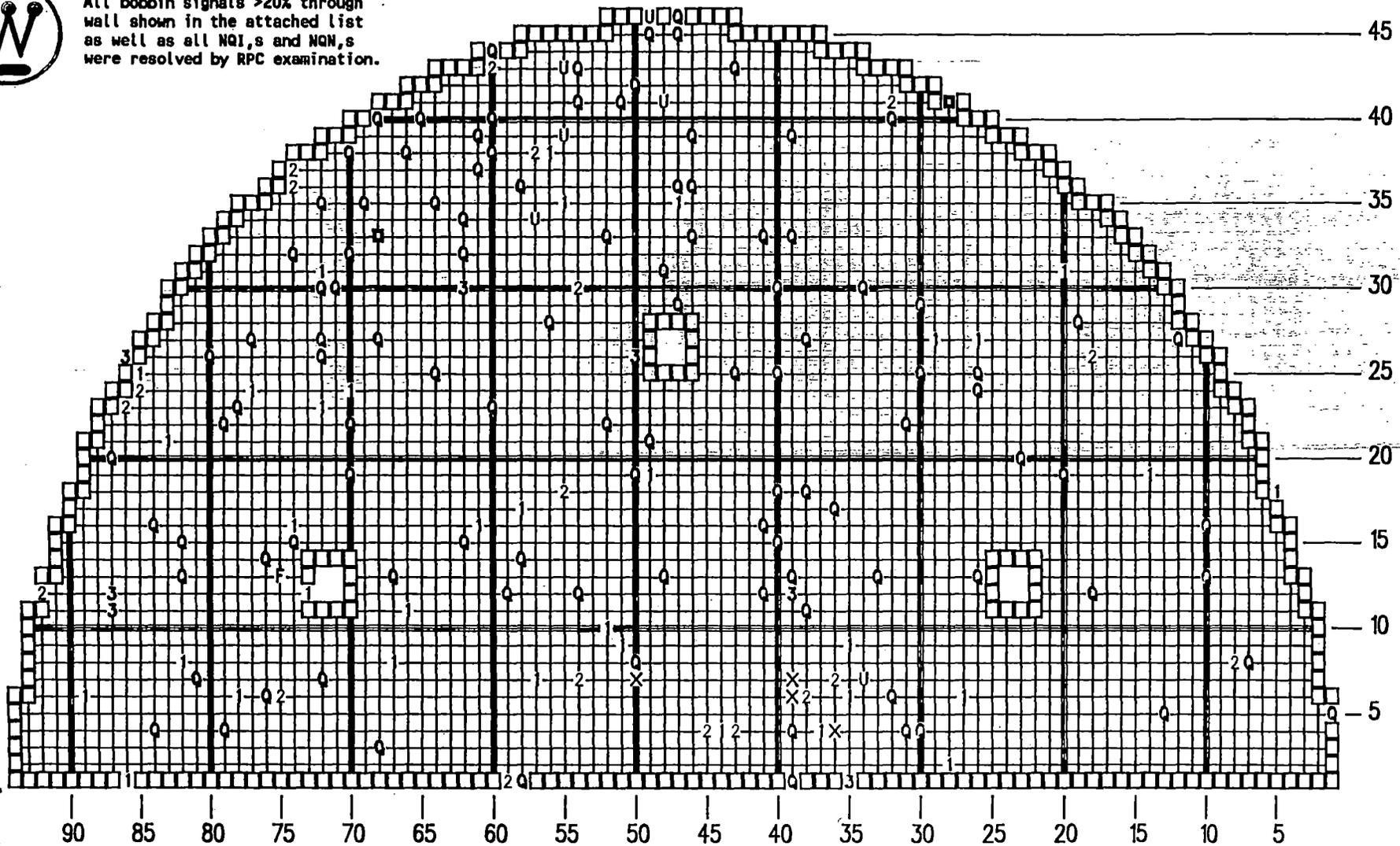
SUPERTUBIN

- X : 4 SAI/MAI INDICATION
- Q : 108 NQI INDICATION
- U : 6 UDS INDICATION
- 1 : 34 1 - 19% INDICATION
- 2 : 19 20 - 29% INDICATION
- 3 : 7 30 - 39% INDICATION
- F : 1 INDICATION NOT FOUND
- : 2 PLUGGED TUBE



All bobbin signals >20% through wall shown in the attached list as well as all NQI,s and NQN,s were resolved by RPC examination.

ATTACHMENT 4



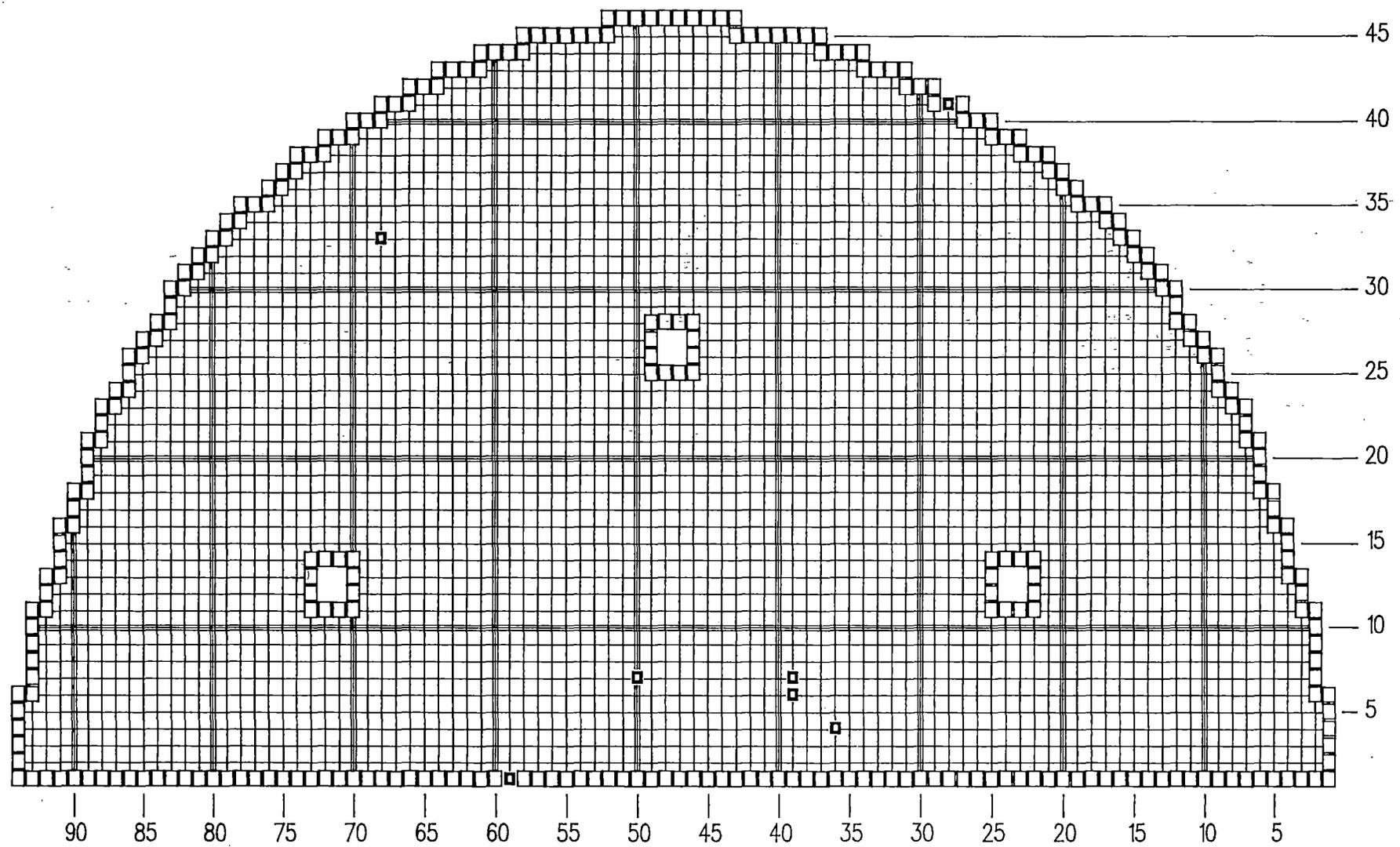
DATE OF LAST ACTIVITY; 02/95
□ : 7 PLUGGED TUBE

VIR -A



02-20-1995

ATTACHMENT 4



7

ATTACHMENT 5

**VIRGINIA ELECTRIC AND POWER COMPANY
GLOSSARY OF TERMS
SURRY POWER STATION
ANNUAL STEAM GENERATOR
INSERVICE INSPECTION REPORT**

ATTACHMENT 5

VIRGINIA ELECTRIC AND POWER COMPANY STEAM GENERATOR EDDY CURRENT TUBE INSPECTION

GLOSSARY OF TERMS

1. ROW, COL - COLUMN - tube identifier numbers - an X-Y coordinate system.
2. IND - INDICATION - Character codes and numerics that represent the analysis results of the data for that tube, e.g., SIA, 25%, etc.
3. LOCN - LOCATION - The location in the tube of the INDICATION called.
4. MAI - MULTIPLE AXIALLY ORIENTED INDICATION - Describes multiple axially oriented indication signals from rotating Pancake Coil probe data.
5. NQI - NON-QUANTIFIABLE INDICATION - A call to identify a bobbin probe signal that is >40% through wall and requires a RPC test to for final disposition.
6. NQN - NON-QUANTIFIABLE INDICATION THAT DIDNT CHANGE FROM HISTORY - A NQI call that was looked up in past outage data and found to have had no change.
7. 55 - A number in the indication column shows the % through wall depth of the indication.
8. RST - RESTRICTED - Indicates that the probe listed in the record would not physically pass the location specified.
9. SAI - Describes a single axially oriented indication signals from Rotating Pancake Coil probe data.
10. UDS - UNDEFINED SIGNAL - a signal that in the analyst's opinion does not at present represent tube wall loss - the signal is reported for future review purposes
11. DSI - DISTORTED SUPPORT INDICATION - a possible tube wall loss condition that is unquantifiable with a numeric percent call due to the signal characteristics and is located at a support plate.
11. TEH - Tube End Hot leg.
12. TEC - Tube End Cold leg.
13. TSH - Top of Tubesheet Hot leg.

ATTACHMENT 5

**VIRGINIA ELECTRIC AND POWER COMPANY
STEAM GENERATOR EDDY CURRENT TUBE INSPECTION**

GLOSSARY OF TERMS

14. TSC - Top of Tubesheet Cold leg.
15. BPH, BPC - BAFFLE PLATE HOT AND COLD
16. #C, #H - (# = number) of Support Plate Hot or Cold leg.
e.g., 3H, 6H, 7C.
17. AV1, AV2, AV3, AV4 - Anti-Vibration Bars 1 through 4.

Note: Where no comment appears in the remarks column the tube is still in service.