Commonwealth Edison Company
Byron Generating Station
4450 North German Church Road
Byron, IL 61010-9794
Tel 815-234-5441

February 8, 2000

ComEd

LTR: BYRON 2000-0012
File: 3.11.0320

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Byron Station, Unit 2
Facility Operating License No. NPF-66
NRC Docket No. STN 50-455

SUBJECT: Steam Generator Inservice Inspection Summary Report

In accordance with item b. of Technical Specification 5.6.9, "Steam Generator (SG) Tube Inspection Reports," we are submitting the results for the SG tube inspections performed during the Byron Station, Unit 2, Cycle 8 refueling outage (i.e., B2R08) within twelve months following completion of the inspections. The report of the results includes the number and extent of SG tubes inspected. SG tube eddy current inspections were performed in November of 1999 at Byron Station Unit 2. During the inspections, fourteen tubes were removed from service as a result of tube degradation.

This report is also being submitted in accordance with Article IWA-6000, "Records and Reports", and Appendix IV, "Eddy Current Examination of Non-Ferromagnetic Steam Generator Heat Exchanger Tubing," of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, 1989 Edition. Lastly, this report is also being submitted in accordance with Section 4.0 of Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines."

Should you have any questions regarding this report, please contact Mr. Brad Adams, Regulatory Assurance Manager, at (815) 234-5441, extension 2280.

Respectfully,

William Levis
Site Vice President
Byron Station

WL/JL/kh

Attachment: Steam Generator Eddy Current Inspection Report (B2R08)

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector, Byron Station

(p:00byltrs\000012.doc)

A047

Attachment

Commonwealth Edison Company

BYRON STATION UNIT 2

COMMERCIAL OPERATION: 08/21/87

STEAM GENERATOR EDDY CURRENT INSPECTION REPORT

CYCLE 8 REFUELING OUTAGE (B2R08)

November 1999

ComEd
P.O. Box 767
Chicago, IL 60690

Byron Nuclear Power Station
4450 North German Church Road
Byron, Illinois 61010

Documentation Completed Date: February 1, 2000

TABLE OF CONTENTS

1.0 INTRODUCTION

Byron Station Unit 2 operates with four Westinghouse Model D-5 recirculating steam generators (SGs) in the four loop pressurized water reactor system. The steam generators contain thermally treated Inconel-600 U-tubes that have a nominal outside diameter of 0.750 inches and a nominal thickness of 0.043 inches. See Figure A.1 for a diagram of the D-5 Steam Generator configuration.

In compliance with Byron Station Technical Specification 5.5.9 and ASME Section XI (IWB 2500-1, Exam Category B-Q, item B16.20), 1989 Edition, SG eddy current examinations were conducted by Westinghouse Electric Corporation during the Byron Station Unit 2 Cycle 8 refueling outage. In addition, the inspections were performed in accordance with Revision 5 of the Electric Power Research Institute (EPRI) PWR SG Examination Guidelines. The inspections were conducted from October 27 through November 4, 1999. The following inspections were performed during this outage:

- 100% Full Length Bobbin Coil in all 4 SGs
- 25% Top of Hot Leg Tubesheet Plus-Point in all 4 SGs
- 25% Row 1 and Row 2 U-Bend Plus-Point in all 4 SGs
- 25% Pre-Heater Baffle Expansions in SG A
- 25% Plus- Point of Hot Leg Dents and Dings >5.0 Volts
- Visual Inspection of Top of Tubesheet Region in all 4 SGs
- 100% Visual Inspection of Previously Installed Welded Tube Plugs
- 25% Visual Inspection of Previously Installed Mechanical Tube Plugs
- 100% Visual Inspection of Newly Installed Tube Plugs

2.0 SUMMARY

The guidance in Revision 5 of the EPRI PWR Steam Generator Examination Guidelines (EPRI Guidelines) was used during this inspection. A degradation assessment was performed prior to the inspection to ensure the proper EPRI Appendix H qualified inspection techniques were used to detect any existing and potential modes of degradation. Each technique was evaluated to ensure that the detection and sizing capabilities are applicable to the Byron Station Unit 2 site specific condition in accordance with Section 6.2.4 of the EPRI Guidelines. All data analysts were qualified to Appendix G of the EPRI Guidelines (QDA). All data analyst and acquisition personnel satisfactorily completed site specific training and testing. An independent QDA process control review was employed to randomly sample the data to ensure that the analysis resolution process was properly performed and that the field calls were properly reported. An analysis feedback process was implemented that required the data analysts to review their missed calls and overcalls on a daily basis.

The modes of tube degradation found during this inspection were anti-vibration bar wear, foreign object wear, pre-heater wear, and outer diameter volumetric freespan indications. There were no scanning limitations during the examinations.

As a result of the eddy current inspections, a total of 14 tubes were repaired by tube plugging. Table 2.1 provides the tube plugging levels for each SG. Table 2.2 provides the total number of tubes plugged by degradation mode. All tubes associated with foreign objects were stabilized and plugged.

TABLE 2.1 Equivalent Tube Plugging

	SG A	SG B	SG C	SG D	TOTAL
Tubes Previously Plugged	49	101	38	17	205
Tubes Plugged in B2R08	1	8	3	2	14
Total Tubes Plugged	50	109	41	19	219
Total Tubes Plugged (%)	1.09%	2.39%	0.90%	0.42%	1.20%

TABLE 2.2 Tubes Repaired during B2R08

Mode of Degradation	SG A	SG B	SG C	SG D	Total
Anti-Vibration Bar Wear	1	3	3	2	9
Pre-Heater Wear	0	1	0	0	1
Foreign Object Wear	0	2	0	0	2
Foreign Object Signal	0	1	0	0	1
Other	0	1	0	0	1
B2R08 Plugging Totals	1	8	3	2	14

3.0 CERTIFICATIONS

3.1 Procedures/Examinations/Equipment

3.1.1 The examination and evaluation procedures used during the eddy current inspection were approved by personnel qualified to Level III in accordance with the 1984 Edition of SNT-TC-1A. Commonwealth Edison (ComEd) Company procedures NDT-E-2, Revision 3, and NDT-E-3, Revision 2, were used for data acquisition and analysis, respectively.

3.1.2 The examinations, equipment, and personnel were in compliance with the requirements of the ComEd and Westinghouse Quality Assurance(QA) Manual for Inservice Inspection, Byron Station Technical Specification 5.5.9, 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code, EPRI PWR SG Examination Guidelines, Revision 5, and industry standards.

3.1.3 Certification packages for examiners, data analysts, and equipment are available at Byron Station. Table A.1 and Table A.2 lists all personnel who performed, supervised, or evaluated the data during this inspection.

3.1.4 MIZ-30A-8 Remote Data Acquisition Units (RDAUs) with EddyNet 98 Version 1.27 software was used in the acquisition of the eddy current data. ANSER 99.2.0.3 software was used in the primary analysis of the data. CoreStar Eddyvision 3.3 was used in the secondary analysis of the data.

3.2 Personnel

3.2.1 The personnel who performed the eddy current inspections were qualified to Level I and Level II in accordance with the 1984 Edition of SNT-TC-1A. The Level I personnel performed the inspections under the direct supervision of Level II personnel.

3.2.2 The personnel who performed the data analysis were qualified to a minimum of Level II in accordance with the 1984 Edition of SNT-TC-1A, Westinghouse and ComEd procedures, with special analysis training (IIA) for non-ferromagnetic tubing.

3.2.3 All eddy current data analysts analyzing data were qualified in accordance with EPRI Appendix G for Qualified Data Analysts (QDA).

3.2.4 All eddy current data analysts were trained and tested in accordance with a site specific performance demonstration program in both bobbin eddy current data and Rotating Pancake Coil (RPC)/Plus-Point data. The analysts were required to achieve a score of 80% or greater on this site specific demonstration exam.

3.2.5 All eddy current data acquisition operators were trained and tested to a site specific acquisition training program. The data acquisition operators were required to achieve a test score of 80% or greater.

3.2.6 The eddy current analysis was subject to two independent analyses. Primary analysis of all data was performed by Anatec, International . An independent company, Corestar International, performed the secondary analysis. Discrepancies between the two parties required Level III concurrence between both parties for the final resolution.

3.2.7 An experienced eddy current Level III QDA was employed to serve as a Process Control Reviewer to randomly sample the data to ensure the resolution process was properly performed and that the field calls were properly reported.

4.0 EXAMINATION TECHNIQUE AND EXAMINATION SCOPE

All eddy current examination techniques used are qualified in accordance with Appendix H of the EPRI PWR SG Examination Guidelines. Each examination technique was evaluated to be applicable to the tubing and conditions of the Byron Station Unit 2 SGs.

4.1 Examination Techniques

4.1.1 All inservice tubes in each SG were inspected full length utilizing a 0.610 inch diameter bobbin coil eddy current probe. For U-Bend and cold leg tubing in rows 1 through 4, a 0.590 inch diameter bobbin probe was utilized to achieve the complete full tube inspection. Nominal probe inspection speed was 40 inches per second for rows 5 through 49 and 24 inches per second for rows 1 through 4. Sufficient sampling rates were used to maintain a minimum of 30 samples per inch. The bobbin coil probes were operated at frequencies of 550 kHz, 300 kHz, 130 kHz, and 20 kHz operating in the differential and absolute test modes. In addition, suppression mixes were used to enhance the inspection. These mixes were as follows: 550/130 kHz differential mix, and a 300/130 kHz absolute mix for flat wear and a 300/130 kHz absolute mix for tapered wear.

4.1.2 25% of the inservice tubes in each SG were inspected at the top of the hot leg tubesheet expansion transition region with a 0.610 inch diameter three coil plus-point eddy current probe. The examinations were performed 3" above to 3" below the secondary tubesheet interface. The probe contained a plus-point coil, a 0.115 inch diameter pancake coil and a 0.080 inch diameter high frequency pancake coil. Nominal probe speed was 0.5 inches per second with a sampling rate to maintain a minimum of 30 samples per inch. The probe was operated at frequencies of 300 kHz, 200 kHz, 100 kHz and 20 kHz operating in the absolute test mode. Three process channels were created to display axial indications in a positive trace.

4.1.3 25% (i.e., 34 tubes/68 baffle expansions) of the tubes in the SG A pre-heater that were expanded into the baffle plates were inspected utilizing a 3 coil plus-point probe described in Section 4.1.2. The examinations were performed 2" above to 2" below the selected baffle plate.

4.1.4 25% of the U-Bend regions of tubes in rows 1 and 2 in each SG were inspected utilizing a 0.580 inch diameter magnetically biased U-Bend plus-point probe. Nominal probe speed was 0.15 inches per second with a sampling rate to maintain a minimum of 30 samples per inch. The probe was operated at frequencies of 400 kHz, 300 kHz, 150 kHz and 20 kHz in the absolute test mode. Three process channels were created to display axial indications in a positive trace.

4.1.5 Tubes containing dents at Hot Leg tube support plates and freespan dings that were sized greater than 5.0 volts with a bobbin coil probe and non-quantifiable indications identified by an "I-Code" were examined with a rotating plus-point probe described in Section 4.1.2. The nominal probe speed for inspection of dents and dings was reduced to 0.15 inches per second while maintaining a minimum sampling rate of 30 samples per inch.

4.1.6 The SG eddy current examination techniques used during this inspection were equivalent to the EPRI Appendix H techniques listed in Table 4.1 below. Each Examination Technique Specification Sheet (ETSS) was evaluated and determined to be applicable to the site conditions.

Table 4.1
EPRI Appendix H Techniques

EPRI Technique ETSS	Probe	Description
96004	Bobbin	AVB/Pre-Heater/TSP/Foreign Object Wear, Freespan Flaws
96006	Bobbin	Tubesheet Expanded Region
96007	Bobbin	ODSCC at Tube Support Plates
96910	Plus-Point	Foreign Object Wear/Freespan Flaw Sizing
96509	Plus-Point	TTS Expansion/Pre-heater Expansion/Dent/Ding PWSCC
96402	Plus-Point	TTS Expansion/Dent/Ding/U-Bend/Pre-heater Expansion ODSCC
96511	Plus-Point	U-Bend PWSCC
96703	Plus-Point	Dent/Ding PWSCC Sizing

PWSCC-Primary Water Stress Corrosion Cracking
ODSCC- Outer Diameter Stress Corrosion Cracking
TSP- Tube Support Plate
TTS – Top of Tubesheet
AVB –Anti-vibration Bar

4.1.7 Figures B.1.1 through B.4.6 contain tube sheet maps indicating the tube inspections that were performed during B2R08.

4.2 Exceptions to EPRI Guidelines

As stated in Section 1.1 of the EPRI PWR SG Examination Guidelines, "Utilities may be able to deviate from specific requirements of this document by providing a documented technical justification for each deviation or through the application of performance-based criteria and risk-based methodologies." Below are instances where technical justifications were provided to take exception to specific guideline requirements.

4.2.1 Section 3.3.2 of the referenced EPRI Guidelines requires that 20% of the active tube population be inspected from tube end to tube end with an EPRI Appendix H qualified technique. Technical justification was completed and documented to limit the inspection of the cold leg baffle plate expansion areas to at least 20% of the population in one steam generator as opposed to at least 20% of the entire population. The justification was submitted to the NRC on October 13, 1995, as part of ComEd's response to NRC Generic Letter 95-03, "Circumferential Cracking of Steam Generator Tubes and was found to be acceptable based on NRC letter dated May 28, 1997.

4.2.2 Section 3.3.4 of the referenced EPRI Guidelines requires that at least 20% of the tube plugs of a design that permit a volumetric examination be inspected each outage. Technical justification was completed and documented to substitute an eddy current inspection with a visual inspection for the installed Inconel 690 roll plugs.

4.3 Recording of Examination Data

The raw eddy current data and analysis results were recorded on optical disks. The data was then loaded into the Westinghouse Eddy Current Data Management System, ST98 version 1.01.03. This system was used to track the proper examination of all tubes and it was also used to generate the final eddy current report summaries.

4.3 Witness and Verification of Examination

Eddy current inspections were witnessed and/or verified by the Authorized Nuclear Inservice Inspectors Mr. Jeff Hendricks and Mr. Greg Feigel of the Hartford Steam Boiler Inspection and Insurance Company of Hartford Connecticut, Chicago Branch, 2443 Warrenville Road, Suite 500, Lisle, Illinois 60532-9871.

5.0 EXAMINATION RESULTS

5.1 Indications Found

5.1.1 Anti-Vibration Bar (AVB) Wear - Tube degradation was found by the 100% bobbin coil examination in the U-bend region due to fretting of the Anti-Vibration Bars on the tube. A total of 484 tubes contained 811 indications of AVB wear. The EPRI Appendix H bobbin coil examination technique 96004 was utilized in this inspection for the depth sizing of AVB wear. Nine tubes were removed from service as a result of AVB wear exceeding the 40% through wall (TW) repair limit. The table below provides a summary of AVB Wear degradation.

Table 5.1.1

	SG A		SG B		SG C		SG D		TOTAL	
	Tubes	Ind.	Tubes	Ind.	Tubes	Ind.	Tubes	Ind.	Tubes	Ind.
<20% TW*	90	111	86	111	99	118	51	56	326	396
20-39% TW*	61	91	113	166	65	85	47	61	286	403
>= 40% TW*	1	1	3	5	3	3	2	3	9	12
TOTAL *	118	203	157	282	128	206	81	120	484	811

* Tubes may contain indications in more than one category.

5.1.2 Foreign Object Wear - Tube degradation was found on two tubes that was attributable to fretting from a foreign object located on the 5th tube support plate in the 2B steam generator. The EPRI Appendix H plus point qualified examination technique 96910 was applied to size the indications at a depth of 9% and 10% through wall. A third adjacent tube contained a foreign object signal with no wall loss (PLP). All three tubes were stabilized and removed from service. No indications of foreign object wear were left inservice. Table 5.1.2 provides a summary of the tubes that were affected by foreign objects.

Table 5.1.2

SG	Row	Column	Indication	Location	Comment
2B	15	5	9%	5H+0.86"	Stabilized/Plugged
2B	15	6	10%	5H+0.75"	Stabilized/Plugged
2B	14	6	PLP	5H+0.60"	Stabilized/Plugged

5.1.3 Pre-Heater Wear - Three tubes were found that contained indications of pre-heater wear. The depth of the pre-heater wear ranged from 4% TW to 28% TW as measured by the EPRI Appendix H qualified bobbin coil examination technique 96004. The tube with the largest indication was preventatively removed from service. Table 5.1.3 below provides a summary of tubes that contain Pre-Heater wear.

TABLE 5.1.3

SG	Row	Column	Indication	Location	Comment
2B	20	56	4%	02C+0.0"	
2B	49	51	28%	07C+0.0"	Plugged
2C	48	36	18%	02C+0.0"	

5.1.4 Other Indications – One tube, Row 47 Column 76 in the 2B steam generator contained a volumetric indication on the outer diameter near the top edge of the tube support plate 02C. The indication was initially detected by the bobbin coil examination and confirmed by a subsequent plus-point probe examination. The indication was sized at a depth of 44% through wall with the Appendix H qualified examination technique 96910. The tube was removed from service.

5.2 Other Results

5.2.1 Hot Leg Top of Tubesheet Inspection Plus-Point Inspection – 25% of the hot leg top of tubesheet regions (i.e., +/- 3 inches) in each steam generator were inspected with a plus-point probe. No indications were reported.

5.2.2 Low Row U-Bend Plus-Point Inspection – 25% of the row 1 and row 2 U-bend regions in each steam generator were inspected with a plus-point probe. No indications were reported.

5.2.3 Pre-heater Expansion Plus-Point Inspection - A sample of 25% of the pre-heater baffle expansions in SG A were inspected with the plus-point probe. No indications were reported.

5.2.4 Dents/Dings > 5.0 Volts Plus-Point Inspection - A sample of 25% of the hot leg dents and dings that were greater than or equal to 5.0 volts (i.e., 162 dents/dings) as measured by the bobbin coil were inspected with a plus-point probe. This sample encompassed those dents and dings located in SG A and SG B. No indications were reported.

5.2.5 Visual Inspection of Installed Tube Plugs - All previously installed welded plugs and 25% of the previously installed mechanical plugs were visually inspected for signs of degradation and leakage. A total of 25 welded plugs and 113 mechanically rolled plugs were visually inspected. In addition, all plugs installed during this outage (i.e., 28) were also visually inspected and the installation parameters were reviewed for acceptable installation. No anomalies were found.

5.2.6 Visual Inspection of Secondary Side - The secondary side of the tubesheet was visually inspected following completion of sludge lancing in each SG. No observations affecting tube integrity were found.

5.2.7 Tables C.1.1 through C.1.4 contains a tube list with axial elevations of all imperfections that contain measurable through wall depth that were found during this inspection.

6.0 REPAIR SUMMARY

Repairs were conducted in accordance with ASME Section XI, 1989 Edition. All tube plugging was performed by Westinghouse using Inconel-690 mechanical tube plugs. All repairs were performed in accordance Westinghouse approved procedures. Table 6.1 depicts the repairs conducted during B2R08. Table D.1 lists the tube locations that were repaired in B2R08.

TABLE 6.1

REPAIRS PERFORMED	SG A	SG B	SG C	SG D	TOTAL
Tubes Plugged*	1	8	3	2	14
Tubes Stabilized	0	4	0	0	4

* Includes number of tubes stabilized and plugged.

7.0 TUBE INTEGRITY ASSESSMENT SUMMARY

Tube integrity assessments were performed to demonstrate that SG performance for each mode of tube degradation met the required structural integrity requirements for the previous operating period, Cycle 8, and for the next operating period, Cycle 9. The assessment for the previous cycle is referred to as a condition monitoring assessment and the assessment for the next cycle is referred to as an operational assessment. The condition monitoring and operational assessments were performed in accordance with Revision 5 of the EPRI PWR Steam Generator Examination Guidelines and the EPRI Steam Generator Integrity Assessment Guidelines. There was no primary to secondary leakage detected during Cycle 8 or upon shutdown for B2R08.

7.1 Degradation Assessment

In order to ensure that appropriate inspections are performed during B2R08, a degradation assessment was performed prior to the outage to identify active and potential degradation mechanisms. For each active and potential degradation mechanism, an appropriate inspection sample and EPRI Appendix H inspection technique was determined. The inspection scope and techniques used are discussed in Section 4.1 of this report. The degradation assessment was performed in accordance with Section 5.2 of the EPRI PWR Steam Generator Examination Guidelines, Revision 5.

7.2 Condition Monitoring/Operational Assessment

7.2.1 Anti-Vibration Bar (AVB) Wear

The structural limit for AVB wear is 74% TW and the Technical Specification repair limit is 40% TW. The deepest AVB wear indication found during B2R08 was 50% TW. With the addition of non-destructive examination (NDE) uncertainty, the deepest AVB wear indication is corrected to 58% TW, which is well below the structural limit. An indication of this size would not be expected to leak during accident conditions. All tubes with indications greater than or equal to the repair limit were removed from service. Cycle 8 condition monitoring for this mode of degradation is acceptable. The results of this inspection is bounded by the previous outage operational assessment.

An operational assessment was performed to compare the largest predicted flaw at the end of Cycle 9 (i.e., 1.40 effective full power years) to the structural limit. This was performed by combining the largest flaw left inservice with NDE uncertainty and an allowance for growth using the largest growth rate from previous inspection results over the expected cycle length. The largest flaw predicted at the end of Cycle 9 is 58.9% TW, which is well below the structural limit of 74% for AVB wear. This results in an acceptable operational assessment.

7.2.2 Pre-heater/TSP Wear

The structural limit for pre-heater/TSP wear is 63% TW and the Technical Specification repair limit is 40% TW. A total of three tubes contained indications of pre-heater/TSP wear with the deepest flaw being 28% TW. With the addition of NDE uncertainty, the deepest flaw is corrected to 35% TW, which is well below the structural and repair limits. An indication of this size would not be expected to leak during accident conditions. The tube that contained the largest flaw was removed from service. Cycle 8 condition monitoring assessment for this mode of degradation is acceptable.

An operational assessment was performed to compare the largest predicted flaw at the end of Cycle 9 (i.e., 1.40 effective full power years) to the structural limit. This was performed by combining the largest flaw left inservice with NDE uncertainty and an allowance for growth using the largest growth rate from previous inspection results over the expected cycle length. The largest flaw predicted at the end of Cycle 9 is 29.9% TW, which is well below the structural limit of 63% for pre-heater/TSP wear. This results in an acceptable operational assessment.

7.2.3 Foreign Object Wear

The structural limit for foreign object wear is 61% TW and the Technical Specification repair limit is 40% TW. A total of two tubes contained indications of foreign object wear with the deepest flaw being 10% TW. With the addition of NDE uncertainty, the deepest flaw is corrected to 22.6% TW, which is well below the structural and repair limits. An indication of this size would not be expected to leak during accident conditions. All tubes that contained indications of foreign object wear were removed from service. Cycle 8 condition monitoring assessment for this mode of degradation is acceptable.

An operational assessment was performed to compare the largest predicted flaw at the end of Cycle 9 (i.e., 1.40 effective full power years) to the structural limit. Since all flaws of this damage mechanism were removed from service, the largest beginning of cycle flaw was assumed to be the minimum detectable flaw from the EPRI inspection technique qualification (all indications were detected during technique qualification). The operational assessment was performed by combining the largest assumed beginning of cycle flaw combined with NDE uncertainty and allowance for growth using the largest growth rate from previous inspection results over the expected cycle length. The largest flaw predicted at the end of Cycle 9 is 28.5% TW, which is well below the structural limit of 61%. This results in an acceptable operational assessment.

7.2.4 Volumetric Indications

The structural limit for volumetric indications is 61% TW and the Technical Specification repair limit is 40% TW. One tube contained an outer diameter volumetric indication and was sized at a depth of 44% TW. With the addition of NDE uncertainty, the deepest flaw is corrected to 56.6% TW, which is well below the structural and repair limits. An indication of this size would not be expected to leak during accident conditions. The tube was removed from service. Cycle 8 condition monitoring assessment for this mode of degradation is acceptable.

An operational assessment was performed to compare the largest predicted flaw at the end of Cycle 9 (i.e., 1.40 effective full power years) to the structural limit. Since all flaws of this damage mechanism were removed from service, the largest beginning of cycle flaw was assumed to be the minimum detectable flaw from the EPRI inspection technique qualification (all indications were detected during technique qualification). The operational assessment was performed by combining the largest assumed beginning of cycle flaw combined with NDE uncertainty and allowance for growth using the largest growth rate from previous inspection results over the expected cycle length. The largest flaw predicted at the end of Cycle 9 is 23.5% TW, which is well below the structural limit of 61%. This results in an acceptable operational assessment.

7.2.5 Secondary Side Internal Integrity

Inspection results found the condition of the SG secondary side internals to be acceptable with no observations impacting tube integrity. No problems were encountered with inserting sludge lance equipment through the access ports, thus indicating that the wrapper remains in place. Eddy current analysis did not identify any missing or degraded tube support plates. No tube wear was found that could be attributable to loose parts from the pre-heater water box components. Condition monitoring of the steam generator secondary side internals is acceptable.

Based upon the results of the condition monitoring assessment and the absence of significant operational changes during the upcoming cycle, secondary internals shall provide the necessary tube support and not result in loose parts during the next operating period.

8.0 DOCUMENTATION

All original optical disks have been provided to ComEd and are maintained at Byron Station. The final data sheets and pertinent tube sheet plots are contained in the Westinghouse Final Outage Report for Byron Unit 2, B2R08, and are also maintained at Byron Station.

9.0 FIGURES/TABLES/ATTACHMENTS

ATTACHMENT A CONTENTS

ATTACHMENT B CONTENTS

ATTACHMENT C CONTENTS

ATTACHMENT D CONTENTS

TABLE A.1
DATA ACQUISITION PERSONNEL CERTIFICATIONS

No.	Name	Company	Level	QDA (Y/N)
1	Bradley, GD	Westinghouse	II	N
2	Burkholder, RS	Westinghouse	II	N
3	Dawson, FD	Westinghouse	II	N
4	Derby, KL	AT	II	N
5	Douglas, BA	Westinghouse	II	N
6	Estel, JW	Westinghouse	II	N
7	Evering, DP	Westinghouse	II	N
8	Frye, PC	Zetec	IIA	Y
9	Gallagher, DR	Westinghouse	I	N
10	Gamache, EM	Zetec	I	N
11	Glenn, WD	Westinghouse	II	N
12	Hazlett, W	Westinghouse	II	N
13	Horvath, JI	Westinghouse	II	N
14	Mardell, DM	Westinghouse	II	N
15	Miller, GW	Westinghouse	II	N
16	Moorhead, GC	Westinghouse	II	N
17	Reif, DL	Westinghouse	II	N
18	Schachte, DM	Westinghouse	II	N
19	Schwering, RS	CoreStar	II	N
20	Scott, AW	Westinghouse	II	N
21	Scott, KL	Westinghouse	II	N
22	Sekeras, CJ	Westinghouse	II	N
23	Young, JA	Westinghouse	II	N

TABLE A.2
DATA ANALYSIS PERSONNEL CERTIFICATIONS

No.	Name	Company	Level	QDA (Y/N)
1	Akre, MG	Anatec	IIA	Y
2	Brack, MT	Anatec	III	Y
3	Caperello, MM	Anatec	IIA	Y
4	Deveau, DC	Anatec	IIA	Y
5	Emery, RS	Anatec	IIA	Y
6	Griffith, TE	Anatec	IIA	Y
7	Himmelspach, RJ	Anatec	III	Y
8	Hodnett, SR	Anatec	IIA	Y
9	Kang, JH	Anatec	III	Y
10	Kerson, CJ	Anatec	IIA	Y
11	Lancaster, ME	Anatec	IIA	Y
12	Linney, TJ, Jr	Anatec	IIA	Y
13	Madison, BF	Anatec	IIA	Y
14	Maestas, RR	Anatec	III	Y
15	McKenzie, JH	Anatec	IIA	Y
16	Roberts, CJ	Anatec	IIA	Y
17	Schaefer, S	Anatec	III	Y
18	Steele, BG	Anatec	IIA	Y
19	Tan, JM	Anatec	IIA	Y
20	Tessier, HA	Anatec	IIA	Y
21	Benefield, C	Verner & James	III	Y
22	Coradi, MD	CoreStar	III	Y
23	DeLaPintiere, LM	Anatech	III	Y
24	Ethridge, GJ	NDE Tech.	IIIA	Y
25	Gardner, CL	Anatec	III	Y
26	*Howe, DW	Anatec	III	Y
27	Maben, DE	Anatec	III	Y
28	Pierini, GP	Westinghouse	III	Y
29	Popovich, RA	Westinghouse	III	Y
30	Raper, LJ	Anatec	III	Y
31	Rogers, GF	Quantum NDE	III	Y
32	Wadzinski, DJ	Anatec	III	Y
33	Bowler, SR	CoreStar	IIA	Y
34	Bowser, GC	CoreStar	III	Y
35	Butcher, S	Verner & James	IIA	Y
36	Causby, GW	CoreStar	IIA	Y
37	Croyle, RJ	CoreStar	III	Y
38	Hill, JW	Verner & James	IIIA	Y
39	Hover, LD	Verner & James	IIIA	Y
40	Ignethron, GJ	Verner & James	IIA	Y

**** Process Control Reviewer***

(Continued)

TABLE A.2
(Continued)
DATA ANALYSIS PERSONNEL CERTIFICATIONS

No.	Name	Company	Level	QDA (Y/N)
41	Martin, AP	CoreStar	IIA	Y
42	McChesney, WD	CoreStar	III	Y
43	McLeod, EJ	Verner & James	IIA	Y
44	Miller, HN	CoreStar	IIA	Y
45	Mullan, WA	Verner & James	IIA	Y
46	Paine, RJ	Verner & James	IIA	Y
47	Palmer, RK	Verner & James	IIIA	Y
48	Pessek, SG	Verner & James	IIA	Y
49	Robertson, RR	CoreStar	IIA	Y
50	Salls, YJ	Verner & James	IIA	Y
51	Salton, JR	Verner & James	IIA	Y
52	Shepard, JD	CoreStar	IIA	Y
53	Smith, JS	CoreStar	IIA	Y
54	Spake, CD	CoreStar	III	Y
55	T hompson, VA	CoreStar	IIA	Y
56	Thulien, TA	CoreStar	IIA	Y
57	Traves, DJ	CoreStar	IIA	Y
58	Turner, DG	CoreStar	IIA	Y
59	Visconti, CG	CoreStar	IIA	Y
60	Webb, JF	Verner & James	IIIA	Y

**** Process Control Reviewer***

MODEL D-5 TUBE SUPPORT DIAGRAM

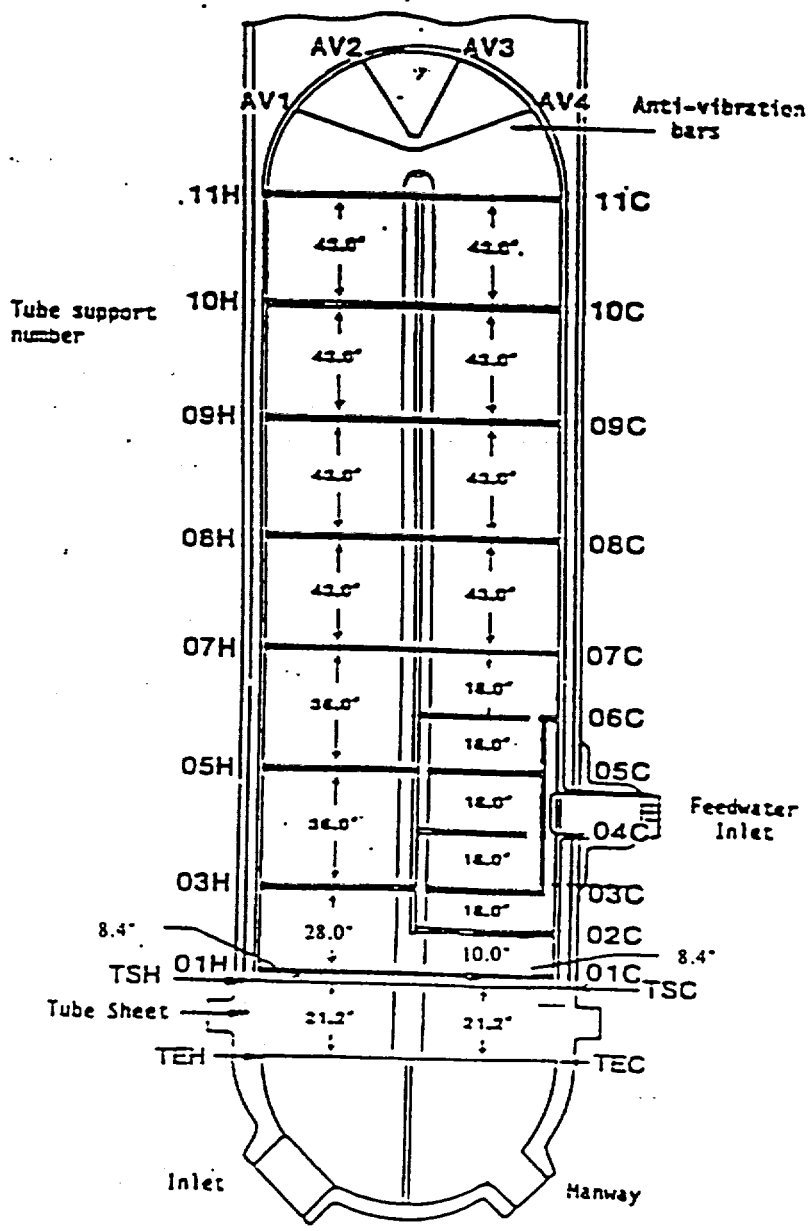


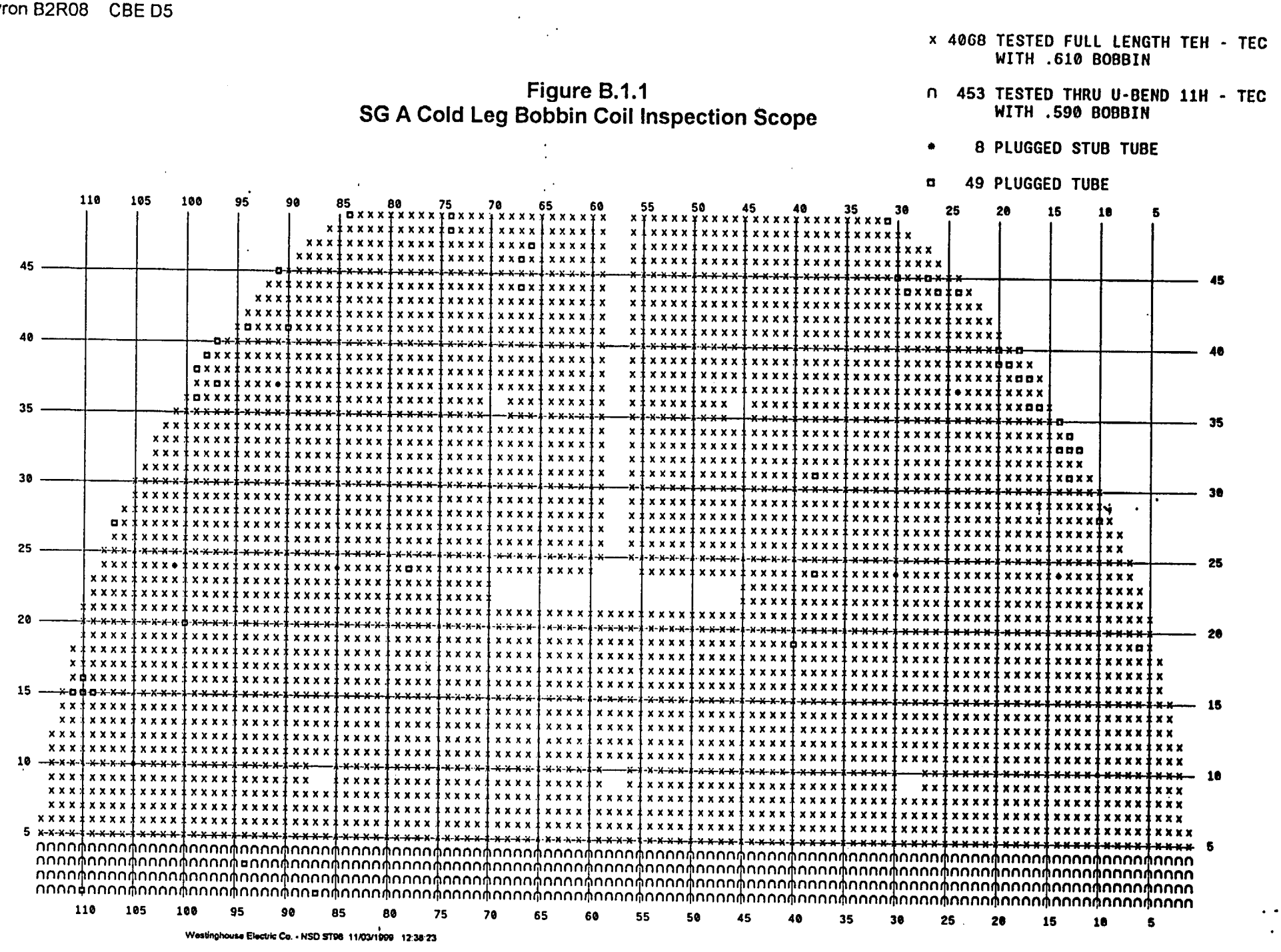
FIGURE A.1
WESTINGHOUSE MODEL D5 TUBE SUPPORT CONFIGURATION

SG - A CL Bobbin Program as Tested

Cold Leg

Byron B2R08 CBE D5

Figure B.1.1
SG A Cold Leg Bobbin Coil Inspection Scope



SG - A HL Bobbin Program as Tested

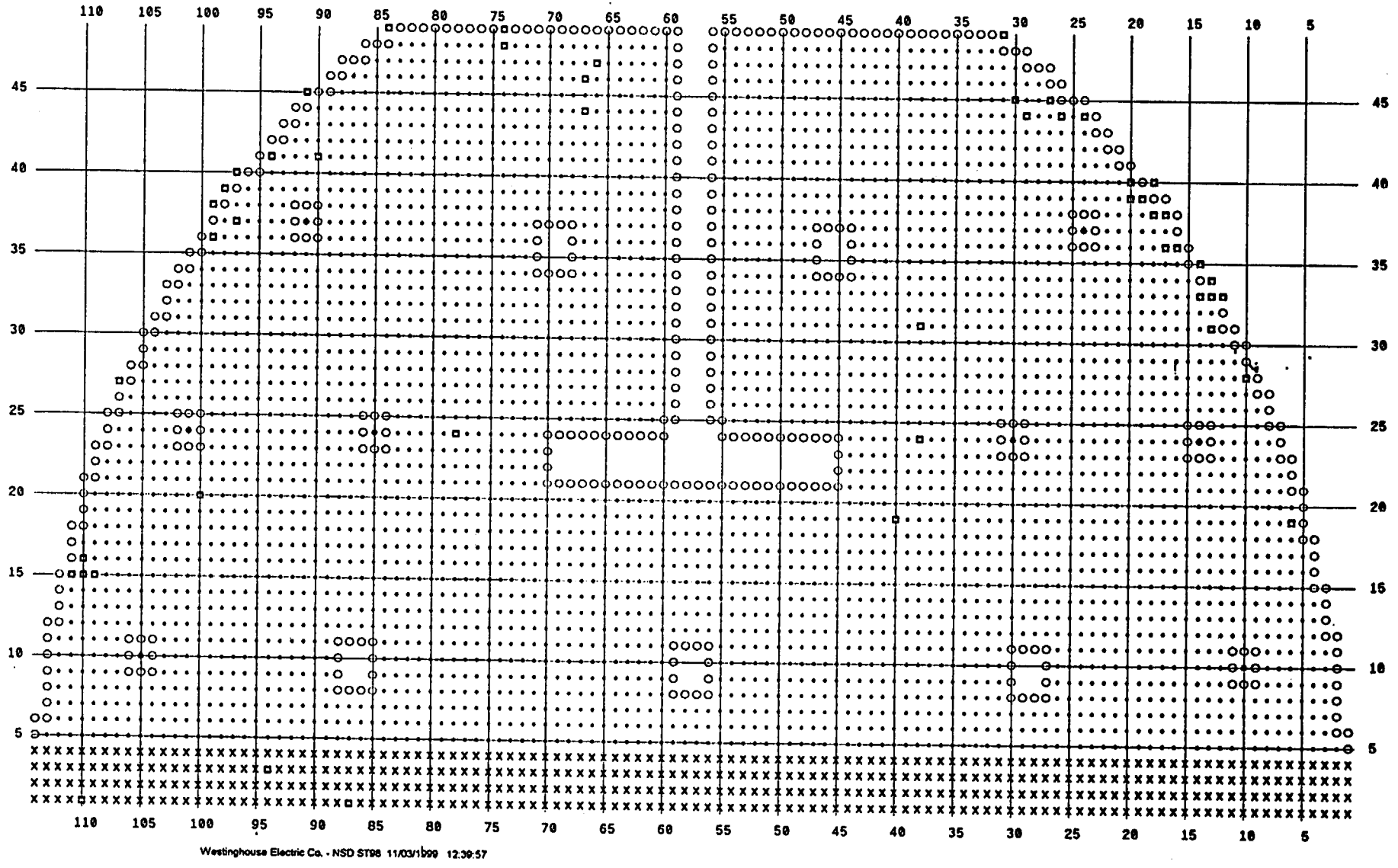
Hot Leg
Byron B2R08 CBE D5

x 453 TESTED STRAIGHT SECTION 11H - TEH WITH .610 BOBBIN

* 8 PLUGGED STUB TUBE

▫ 49 PLUGGED TUBE

Figure B.1.2
SG A Hot Leg Bobbin Coil Inspection Scope



SG - A HL TSH +PT Program as Tested

Byron B2R08 CBE D5

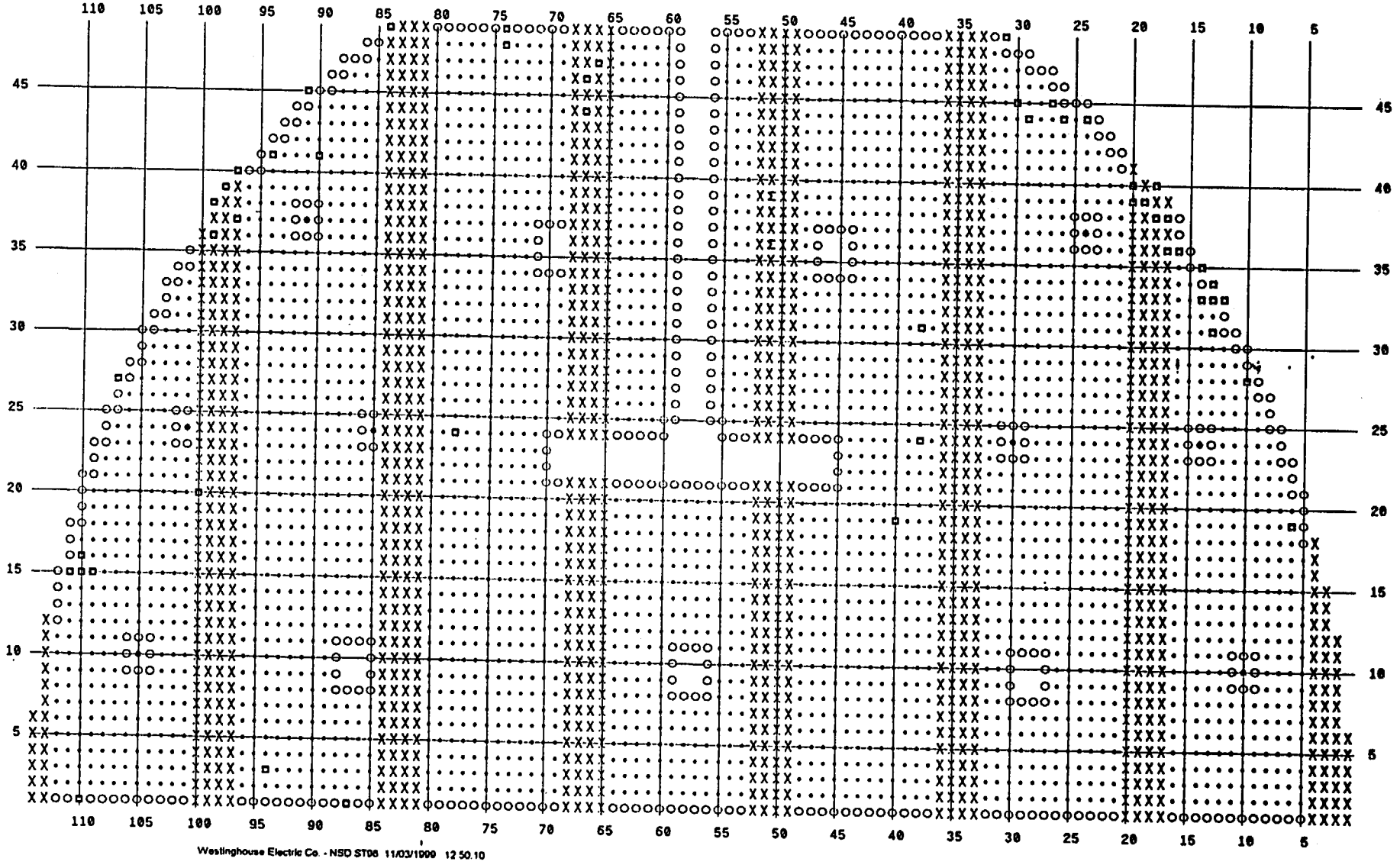
X 1131 TESTED TSH +/-3"

Σ 2 TESTED TSH THRU 01H

* 8 PLUGGED STUB TUBE

□ 49 PLUGGED TUBE

Figure B.1.3
SG A Hot Leg Top of Tubesheet Plus Point Inspection Scope



SG - A HL +PT U-Bend Program as Tested

Hot Leg
Byron B2R08 CBE D5

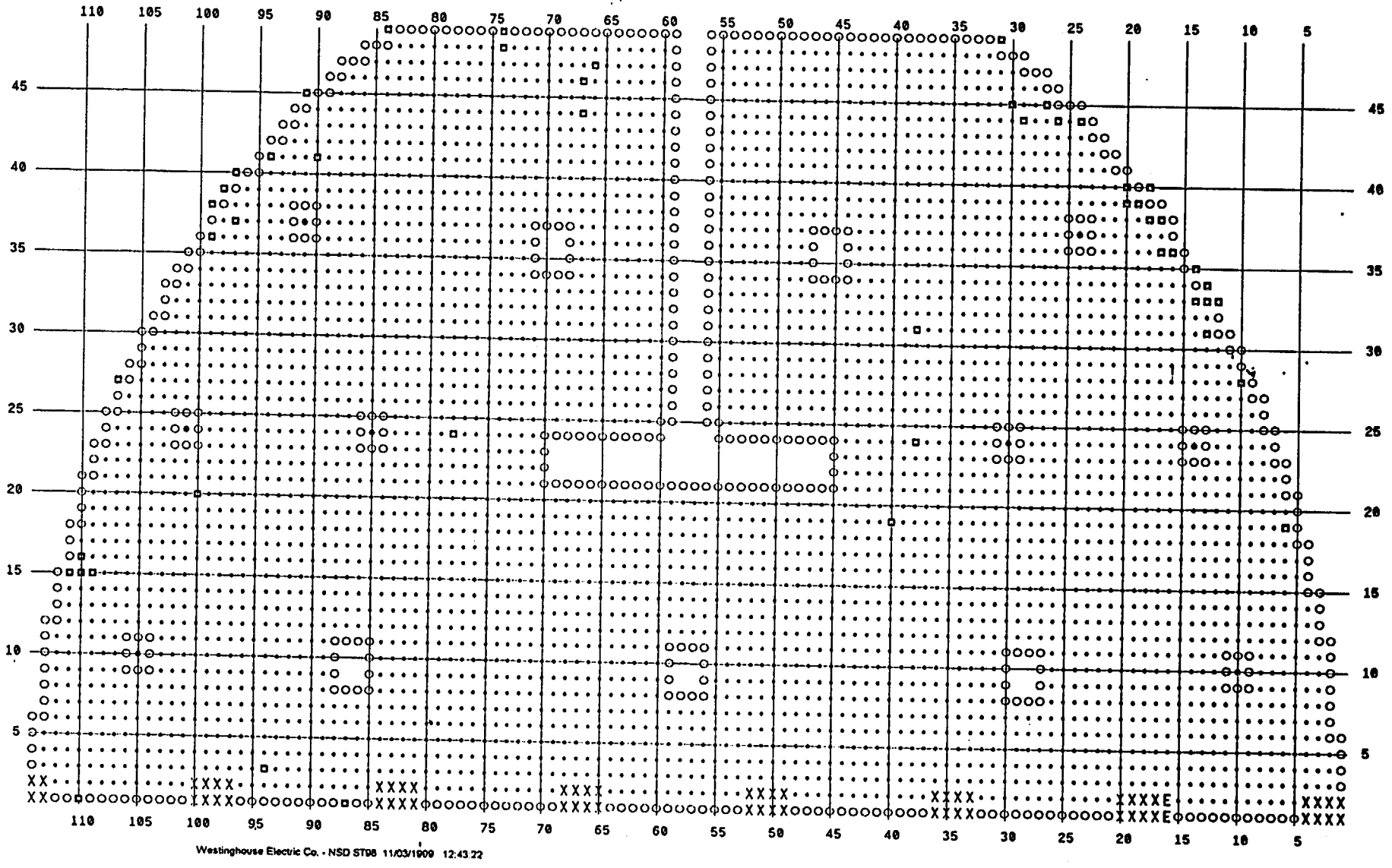
X 60 TESTED U-BEND 11C - 11H

E 2 EXTRA TEST - TESTED U-BEND 11C - 11H

* 8 PLUGGED STUB TUBE

▫ 49 PLUGGED TUBE

Figure B.1.4
SG A Low Row U-Bend Plus Point Inspection Scope



SG - A Cold Leg Baffle Program as Tested

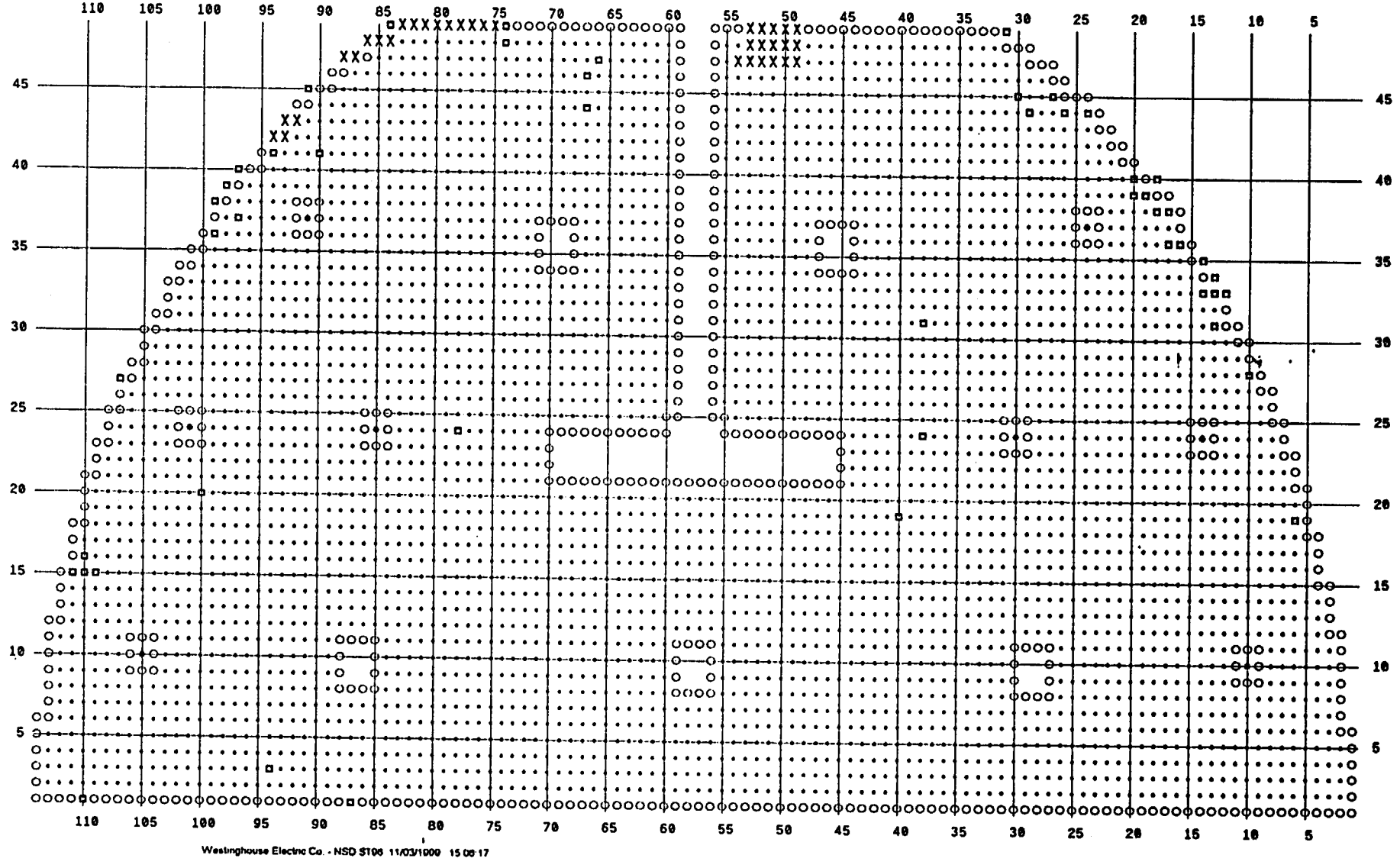
Byron B2R08 CBE D5

X 34 TESTED 02C & 03C +/- 2"

• 8 PLUGGED STUB TUBE

▫ 49 PLUGGED TUBE

Figure B.1.5
SG A Cold leg Baffle Expansion Plus Point Inspection Scope



SG - A Hot Leg +PT Special Interest as Tested

Byron B2R08 CBE D5

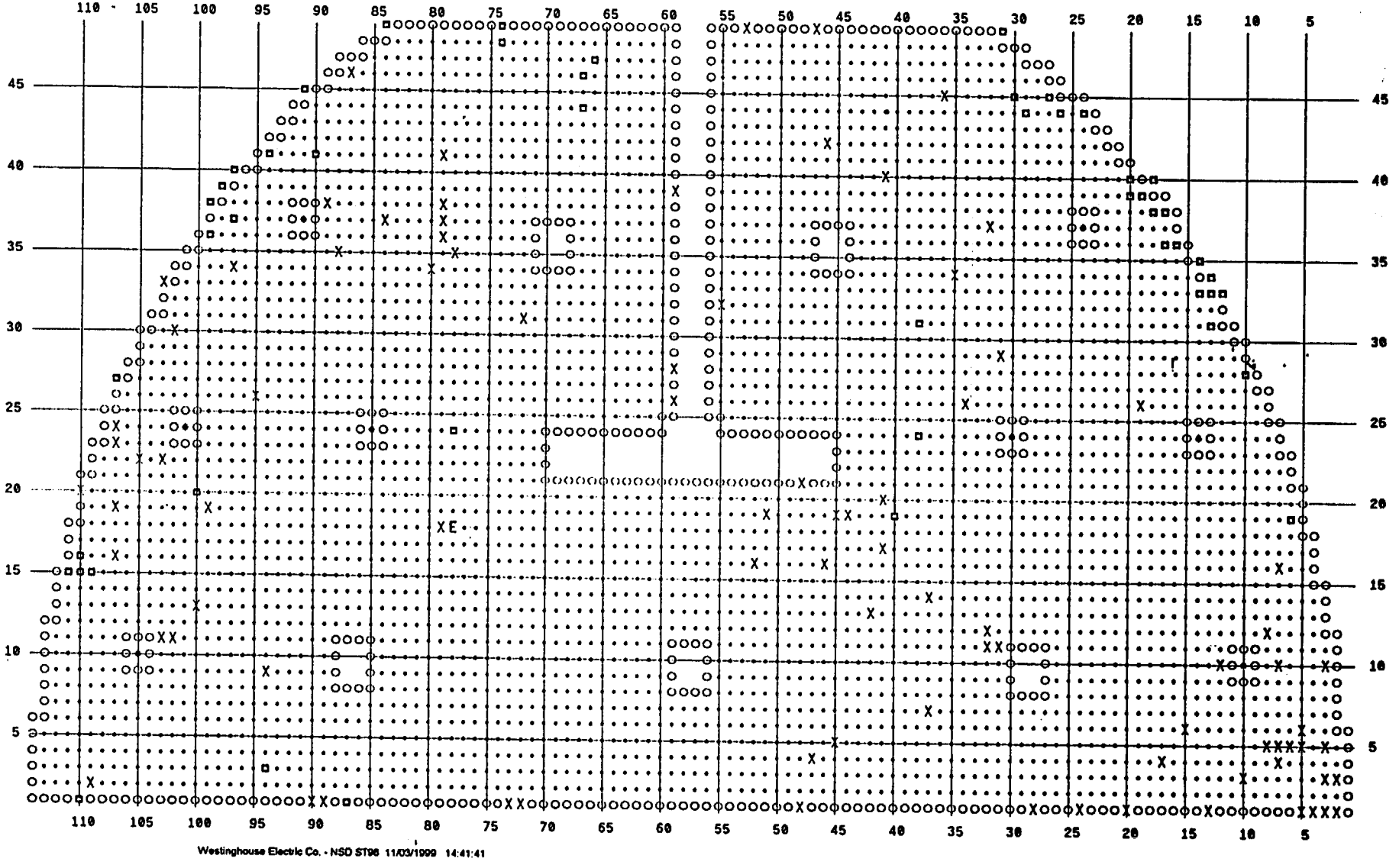
X 89 SCHEDULED +PT TEST

E 1 EXTRA +PT TEST

* 8 PLUGGED STUB TUBE

▫ 49 PLUGGED TUBE

Figure B.1.6
SG A Special Interest Inspection Scope



SG - A HL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

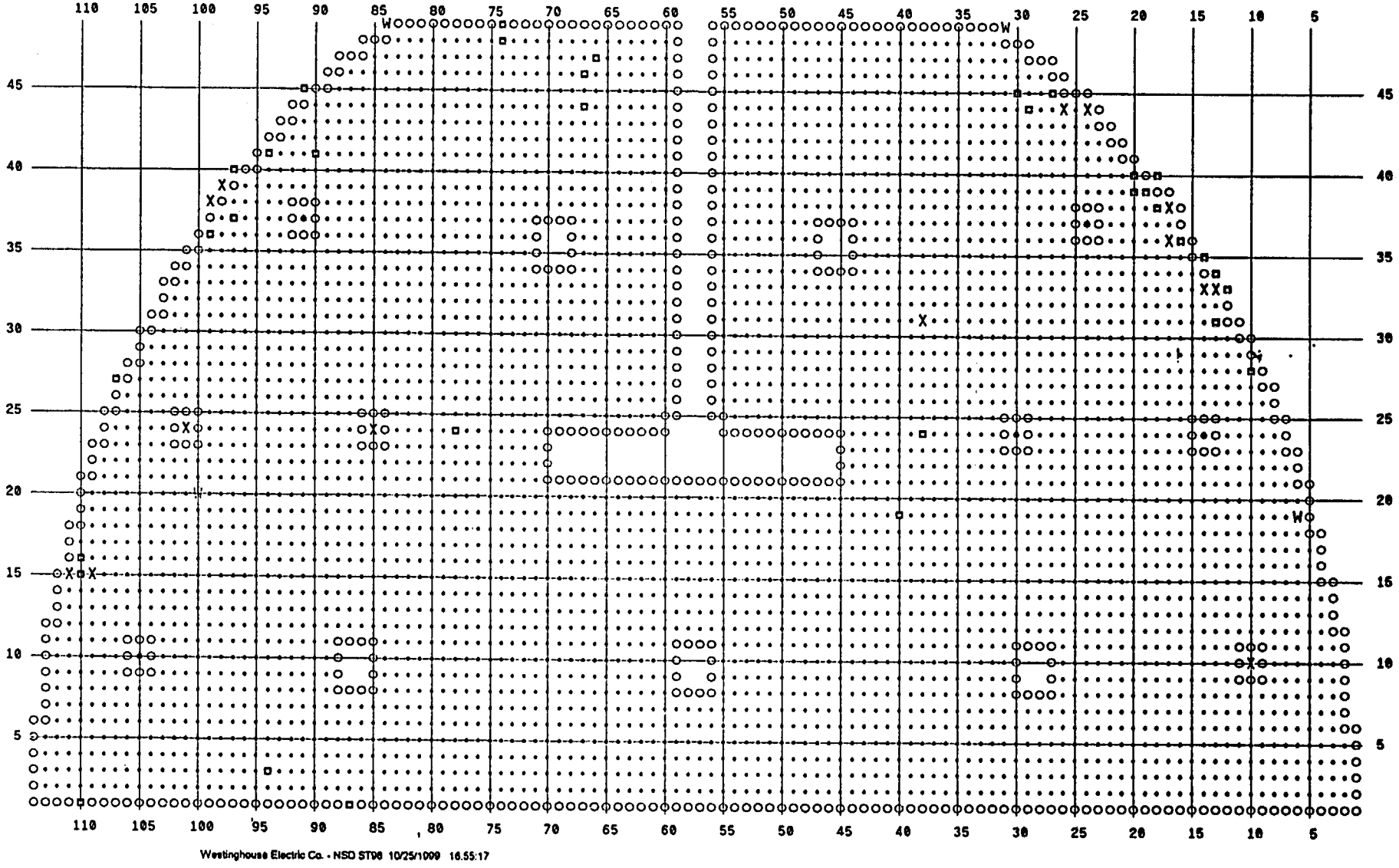
X 14 ROLL PLUG TO INSPECT

W 4 WELD PLUG TO INSPECT

▫ 34 PLUGGED TUBE

• 5 PLUGGED STUB TUBE

Figure B.1.7
SG A Hot Leg Plug Visual Inspection Scope



SG - A CL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

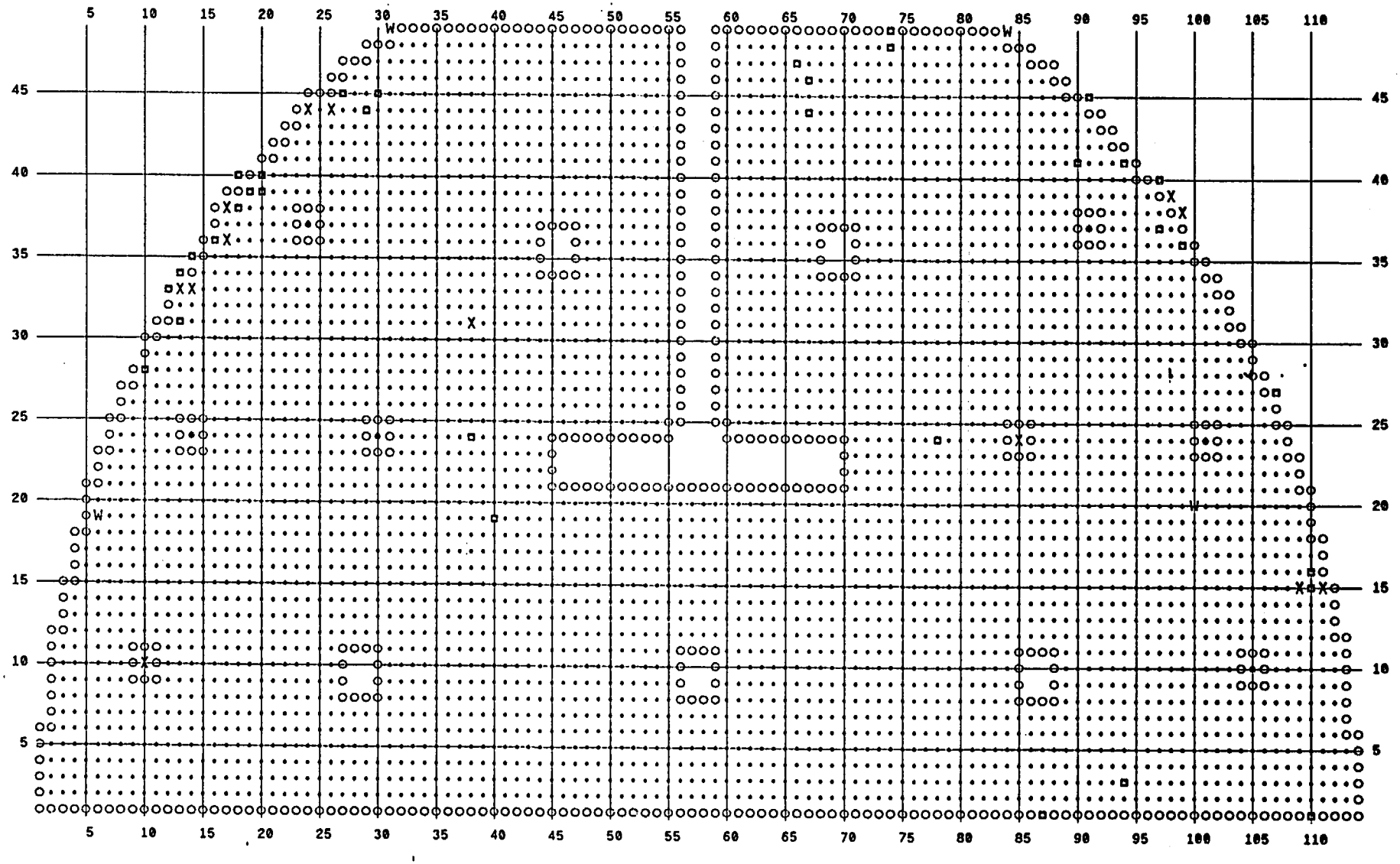
X 13 ROLL PLUG TO INSPECT

W 4 WELD PLUG TO INSPECT

▫ 34 PLUGGED TUBE

* 6 PLUGGED STUB TUBE

Figure B.1.8
SG A Cold Leg Plug Visual Inspection Scope



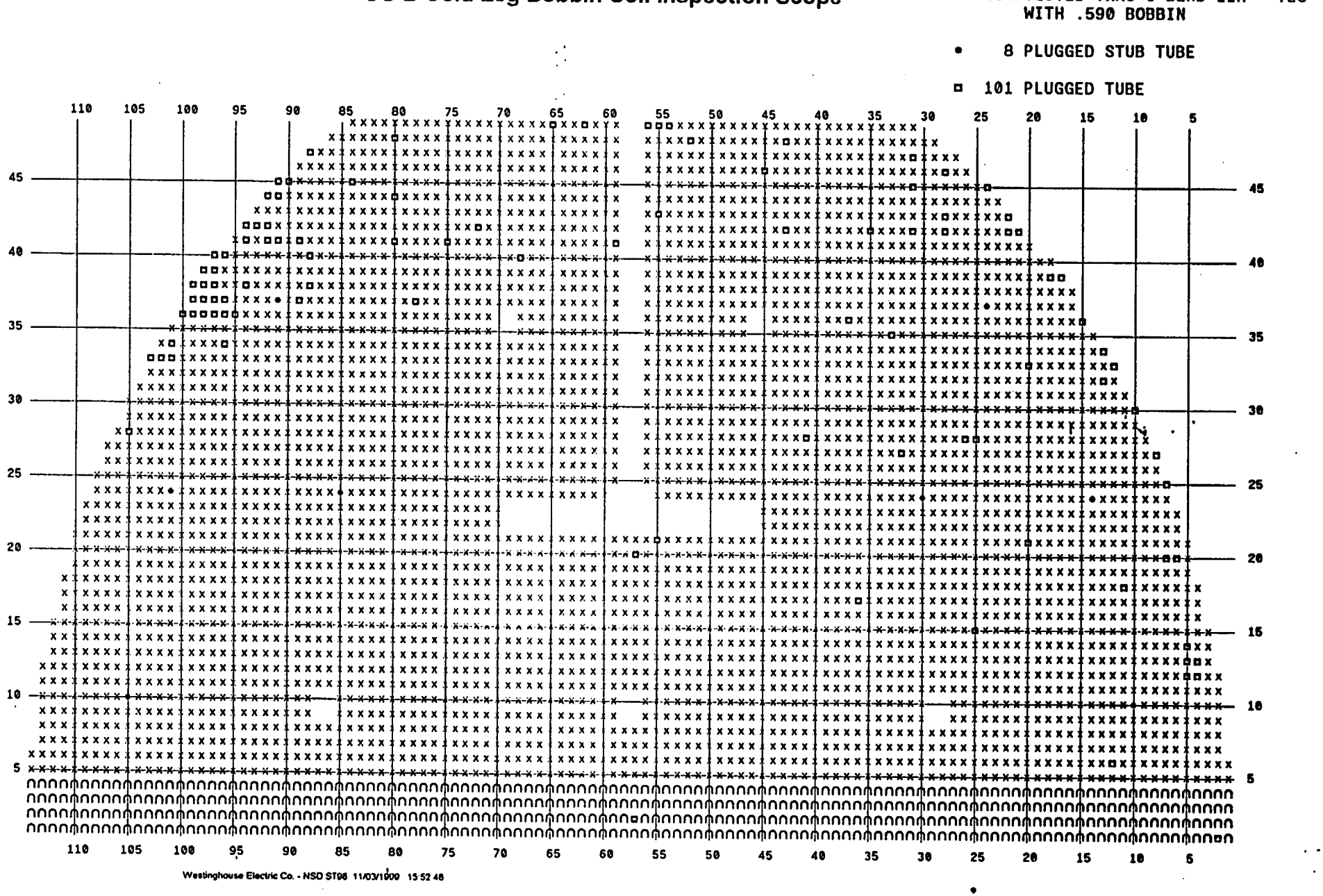
Westinghouse Electric Co. - NSD ST06 10/25/1999 16 55 07

SG - B CL Bobbin Program as Tested

Cold Leg

Byron B2R08 CBE D5

Figure B.2.1
SG B Cold Leg Bobbin Coil Inspection Scope



SG - B HL Bobbin Program as Tested

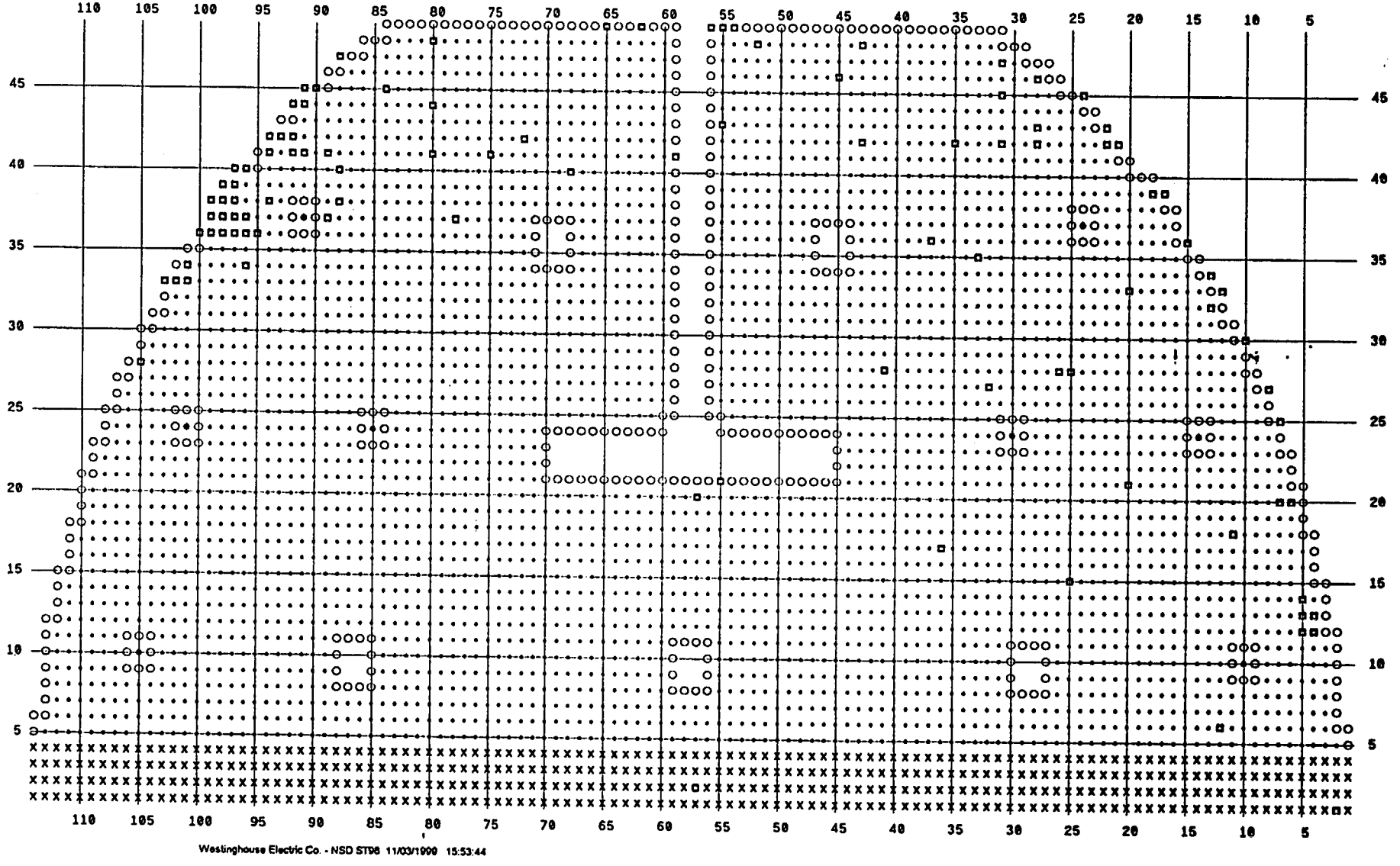
Hot Leg
Byron B2R08 CBE D5

x 454 TESTED STRAIGHT SECTION 11H - TEH WITH .610 BOBBIN

* 8 PLUGGED STUB TUBE

▫ 101 PLUGGED TUBE

Figure B.2.2
SG B Hot Leg Bobbin Coil Inspection Scope



SG - B HL TSH +PT Program as Tested

Hot Leg

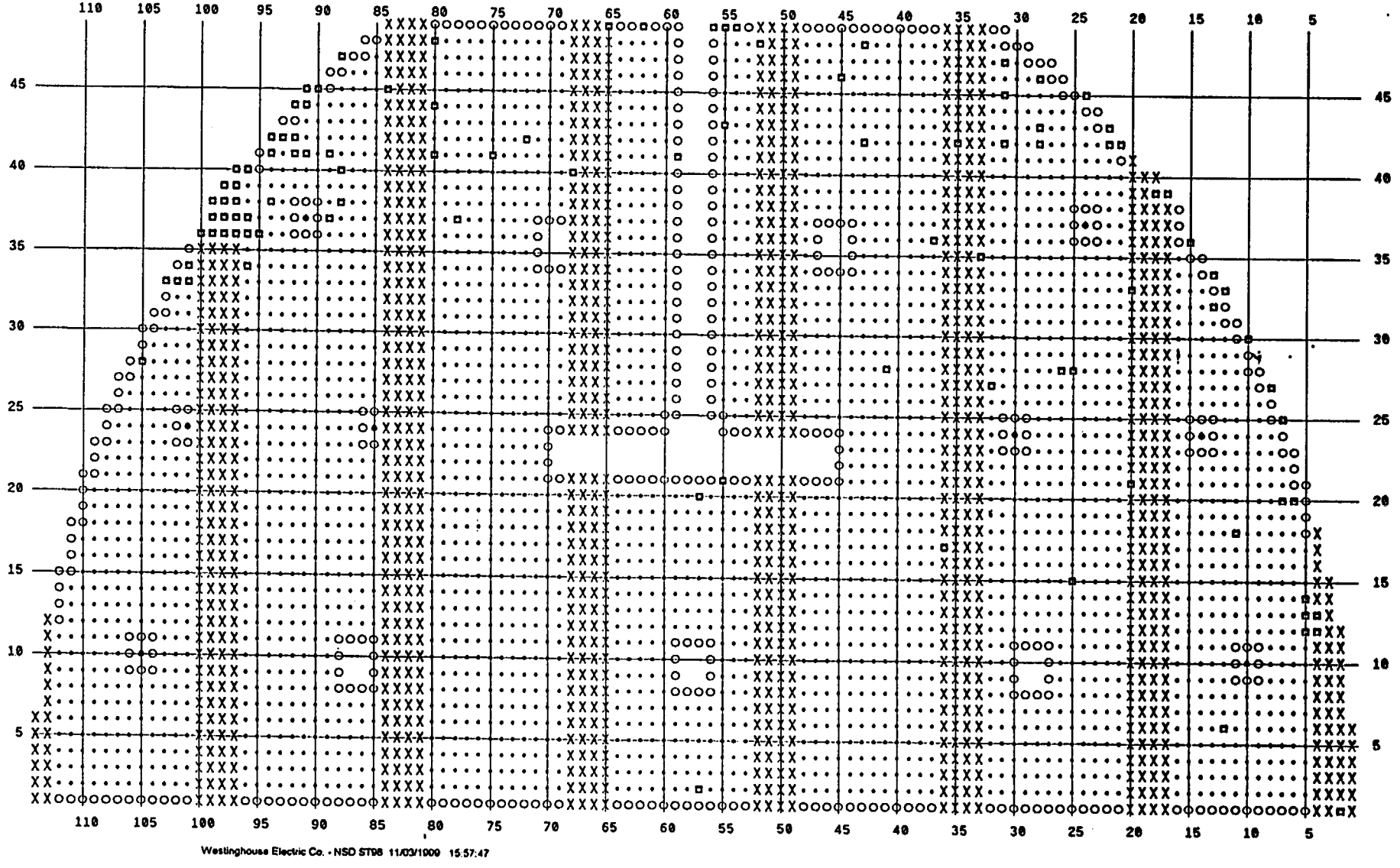
Byron B2R08 CBE D5

X 1123 TESTED TSH +/- 3"

* 8 PLUGGED STUB TUBE

▫ 101 PLUGGED TUBE

Figure B.2.3
SG B Hot Leg Top of Tubesheet Plus Point Inspection Scope

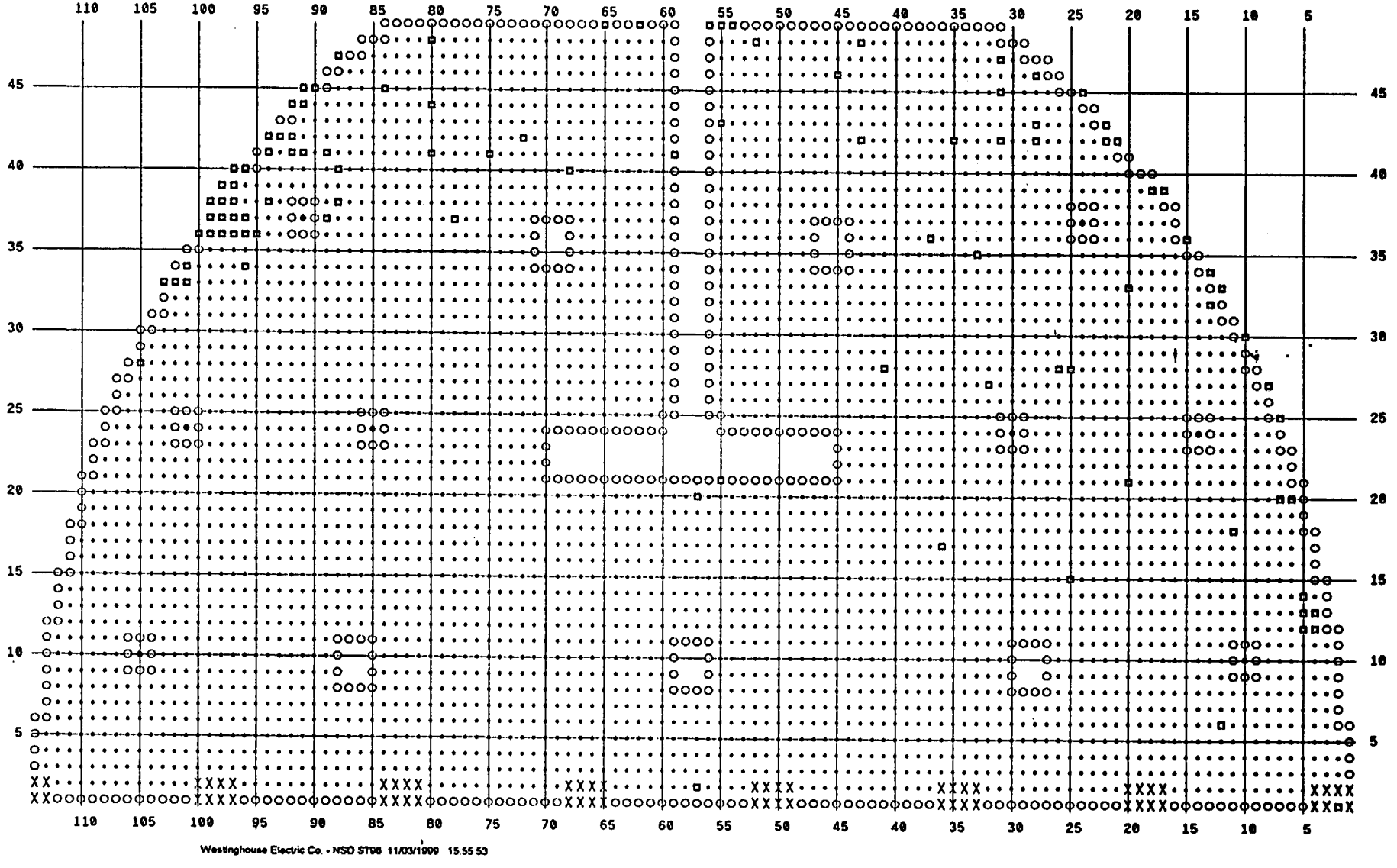


SG - B HL +PT U-Bend Program as Tested

Hot Leg
Byron B2R08 CBE D5

Figure B.2.4
SG B Low Row U-Bend Plus Point Inspection Scope

X 59 TESTED U-BEND 11C - 11H
* 8 PLUGGED STUB TUBE
▫ 101 PLUGGED TUBE



SG - B Hot Leg +PT Special Interest as Tested

Byron B2R08 CBE D5

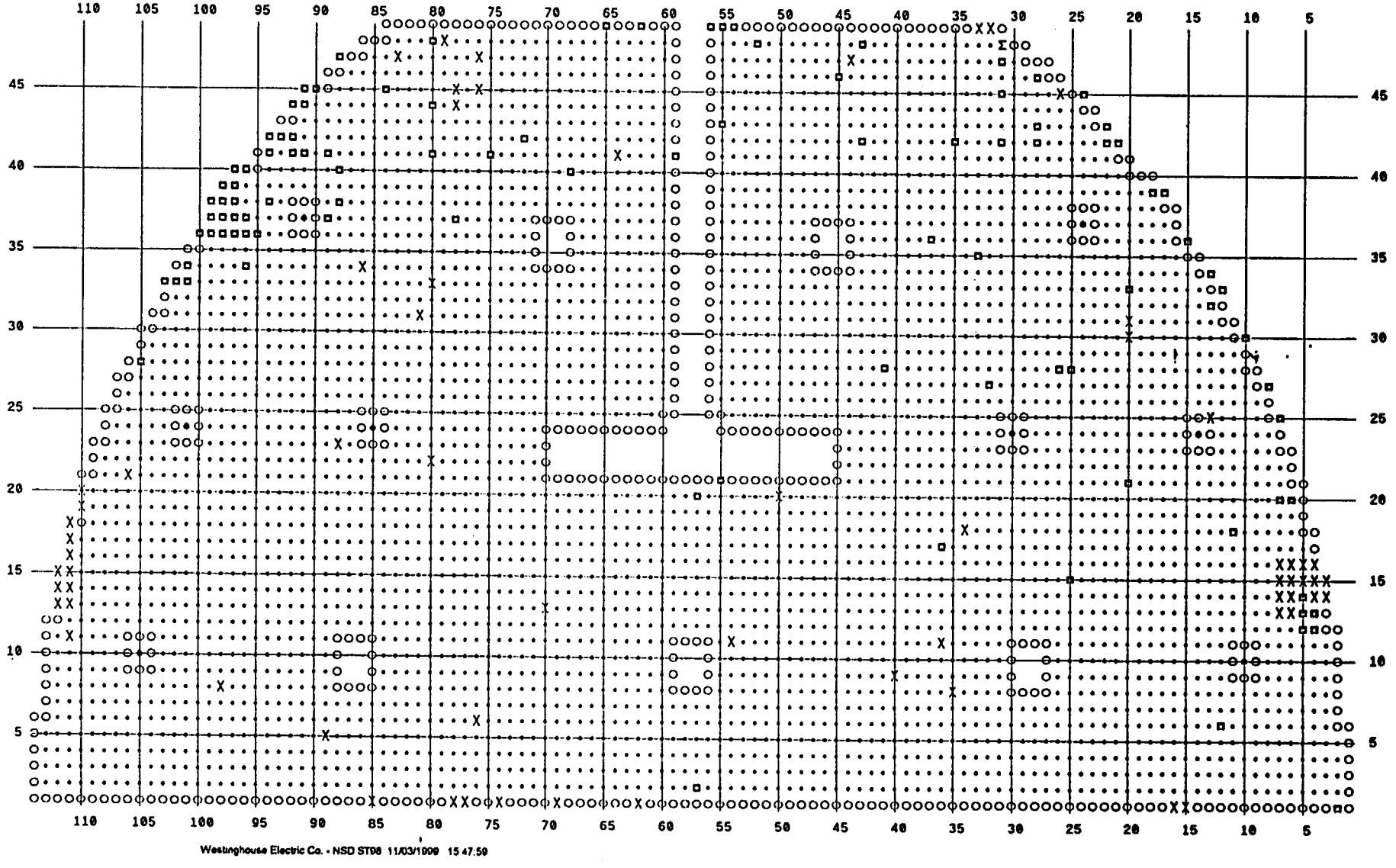
Figure B.2.5
SG B Special Interest Inspection Scope

X 65 SCHEDULED +PT TEST

Σ 1 SCHEDULED +PT TEST AND EXTRA +PT TEST

• 8 PLUGGED STUB TUBE

▫ 101 PLUGGED TUBE



SG - B HL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

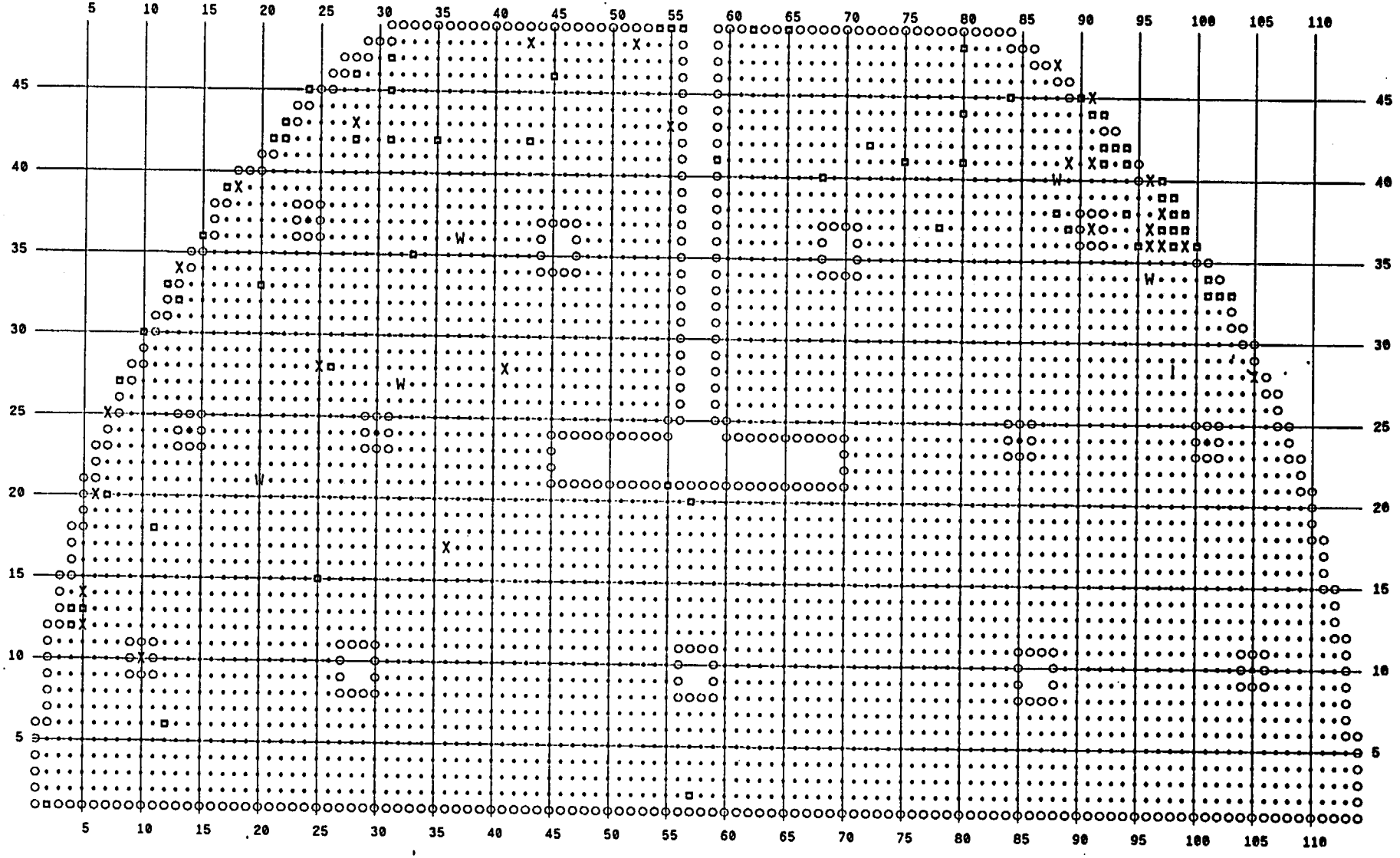
X 26 ROLL PLUG TO INSPECT

W 5 WELD PLUG TO INSPECT

▫ 72 PLUGGED TUBE

• 6 PLUGGED STUB TUBE

Figure B.2.6
SG B Hot Leg Plug Visual Inspection Scope



Westinghouse Electric Co. - NSD ST98 10/25/1999 16:57:56

SG - B CL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

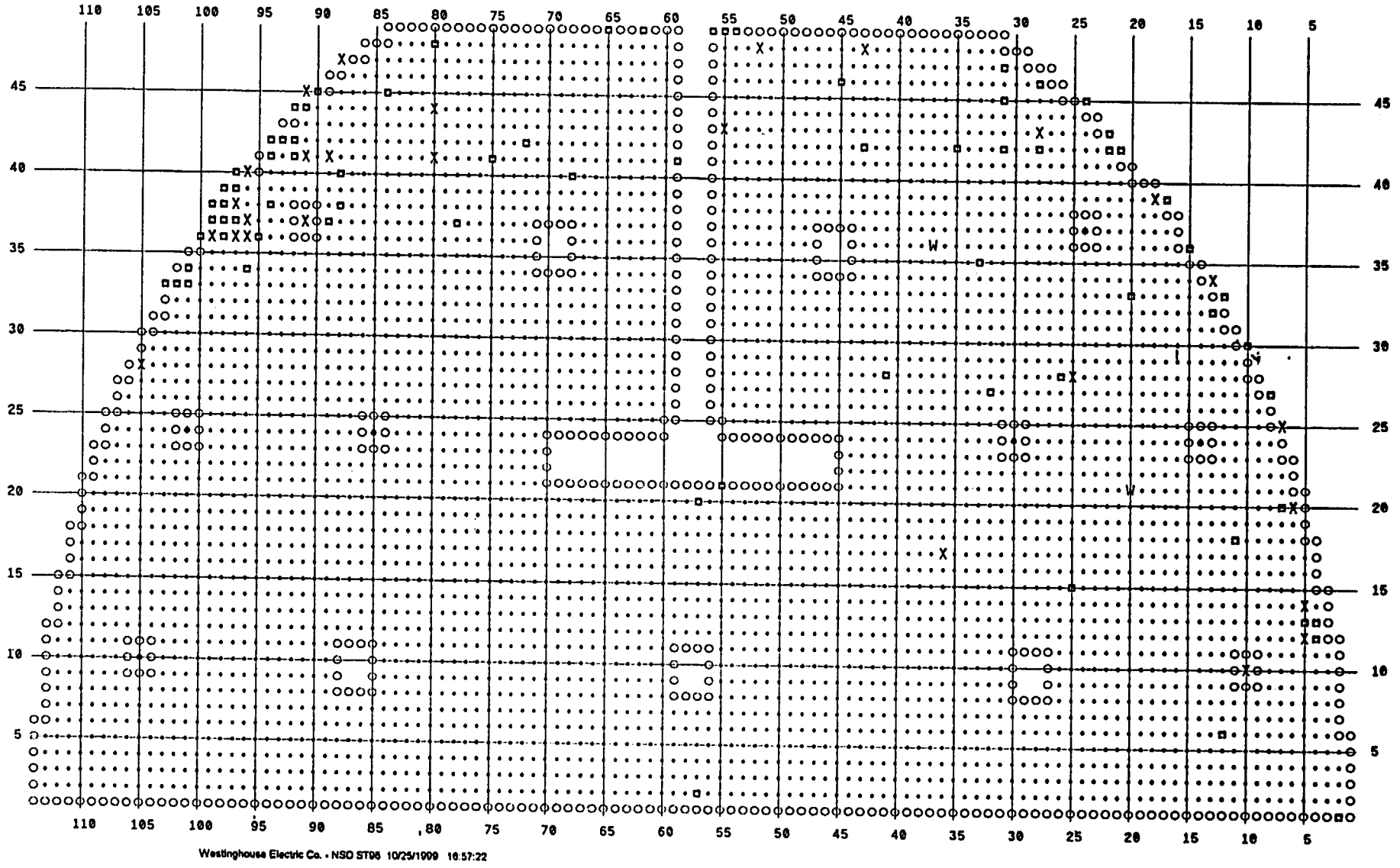
X 27 ROLL PLUG TO INSPECT

W 2 WELD PLUG TO INSPECT

▫ 74 PLUGGED TUBE

• 6 PLUGGED STUB TUBE

Figure B.2.7
SG B Cold Leg Plug Visual Inspection Scope

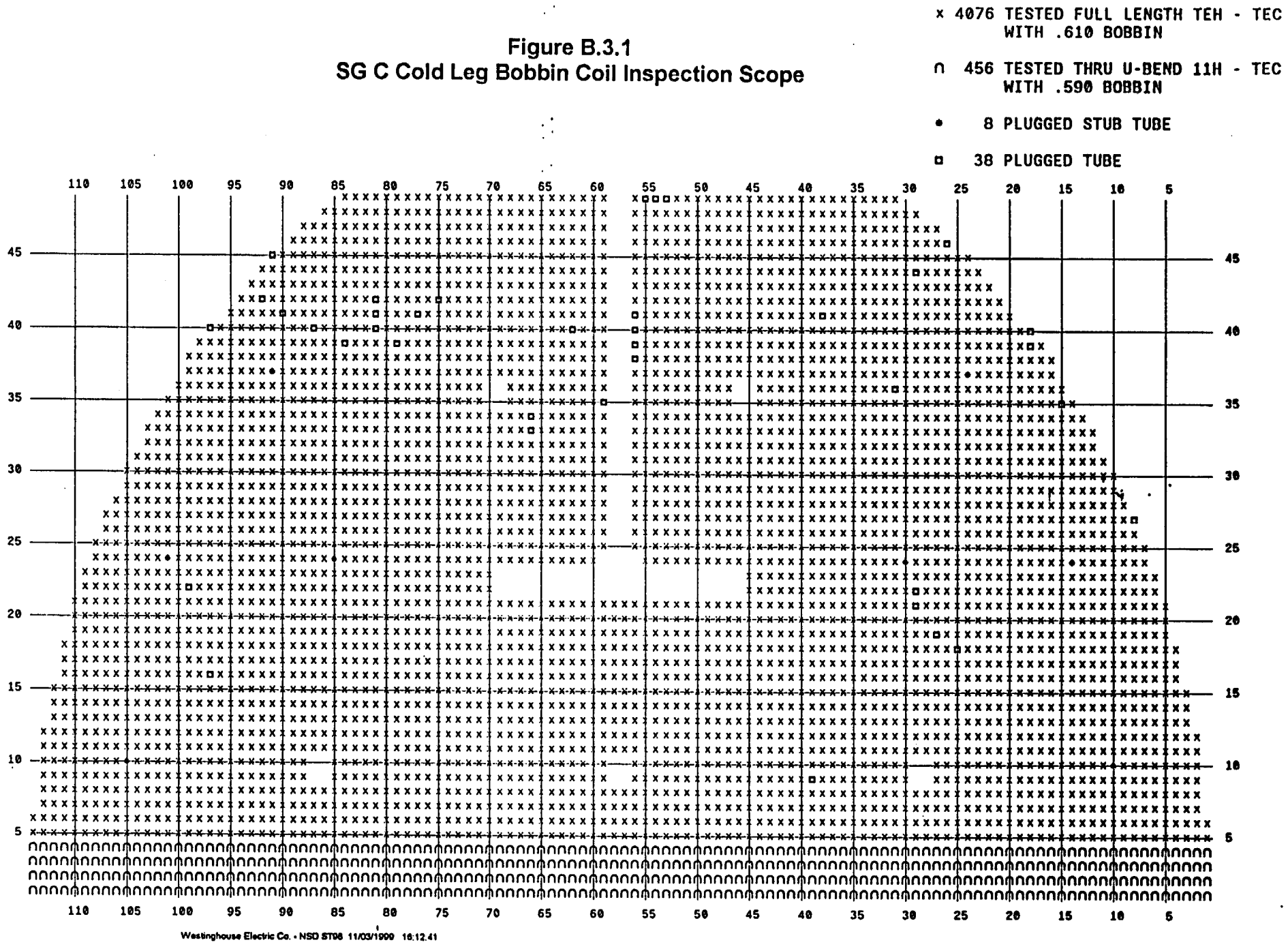


SG - C CL Bobbin Program as Tested

Cold Leg

Byron B2R08 CBE D5

Figure B.3.1
SG C Cold Leg Bobbin Coil Inspection Scope



SG - C HL Bobbin Program as Tested

Hot Leg

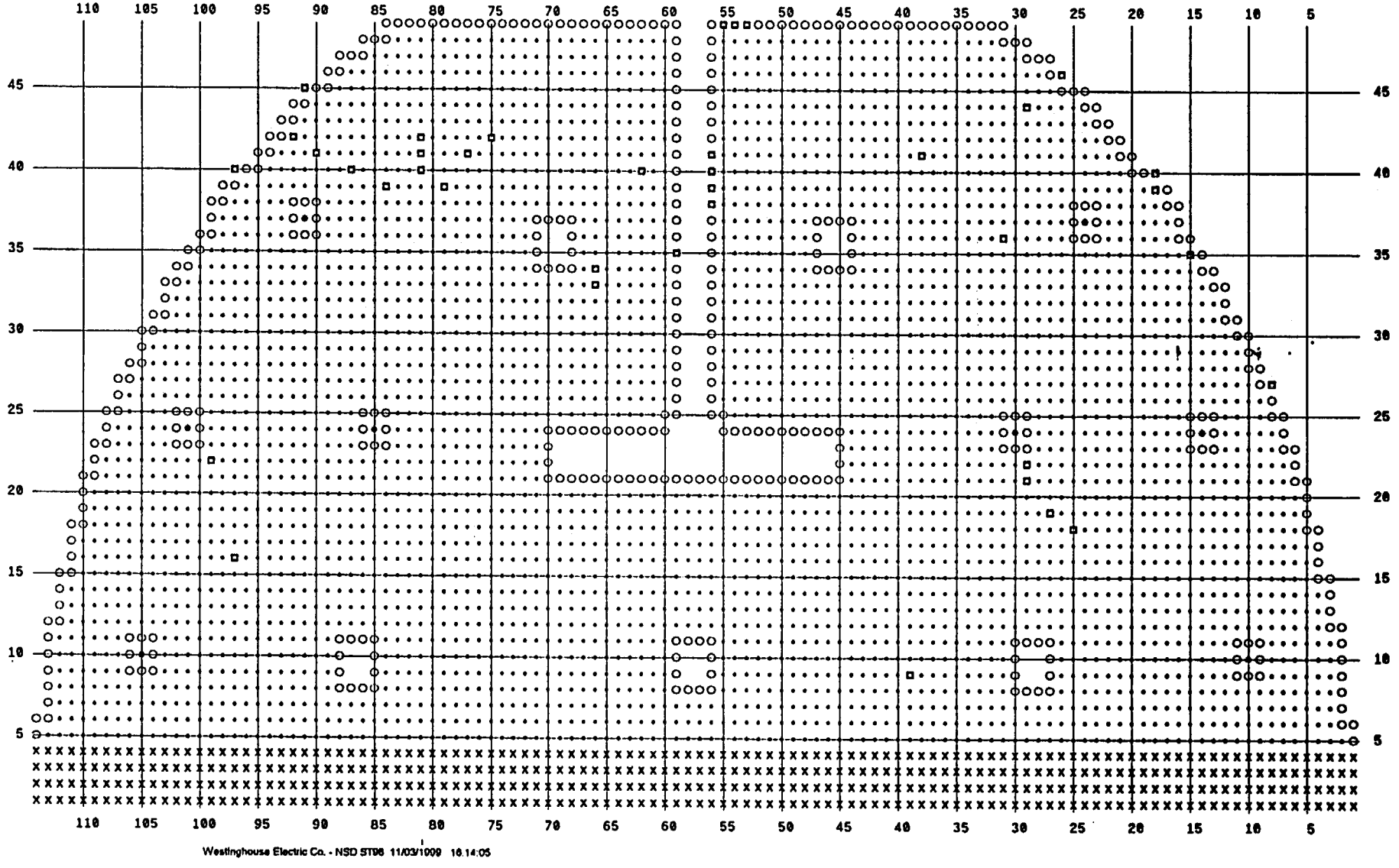
Byron B2R08 CBE D5

Figure B.3.2
SG C Hot Leg Bobbin Coil Inspection Scope

x 456 TESTED STRAIGHT SECTION 11H - TEH WITH .610 BOBBIN

• 8 PLUGGED STUB TUBE

□ 38 PLUGGED TUBE



SG - C HL TSH +PT Program as Tested

Byron B2R08 CBE D5

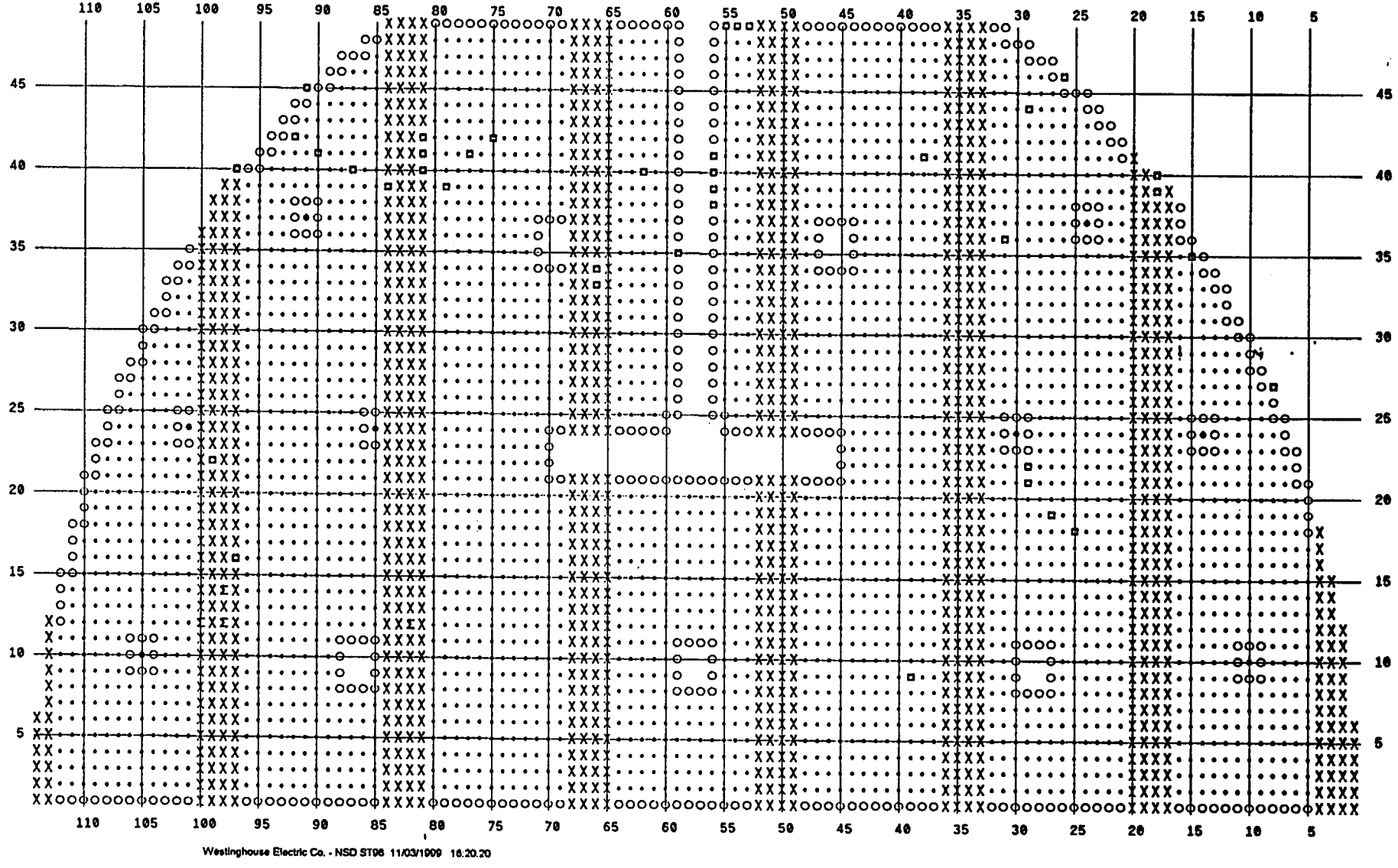
X 1135 TESTED TSH +/-3"

Σ 4 TESTED TSH THRU 01H

• 8 PLUGGED STUB TUBE

▫ 38 PLUGGED TUBE

Figure B.3.3
SG C Hot Leg Top of Tubesheet Plus Point Inspection Scope



SG - C HL +PT U-Bend Program as Tested

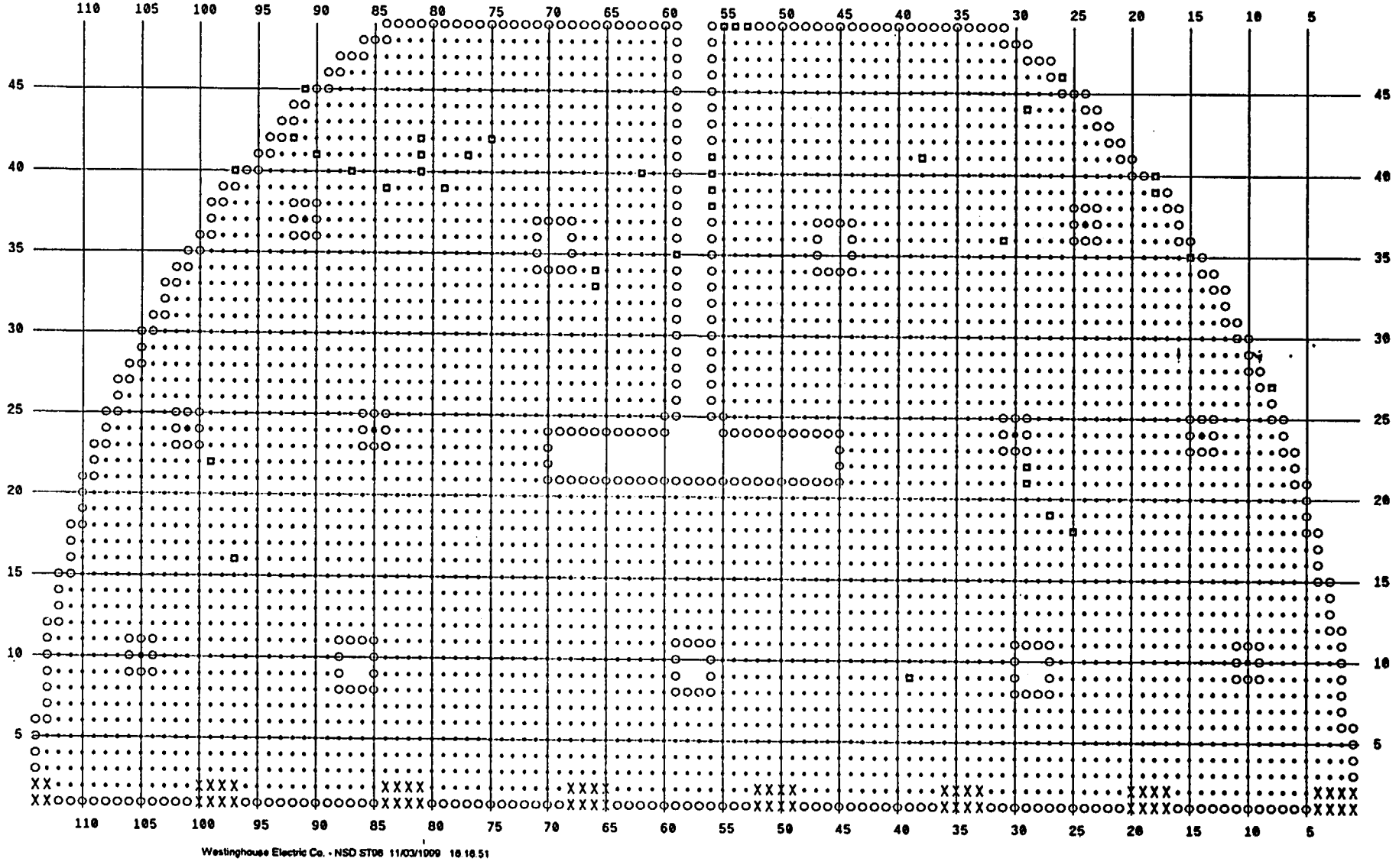
Hot Leg
Byron B2R08 CBE D5

X 60 TESTED U-BEND 11C - 11H

• 8 PLUGGED STUB TUBE

▫ 38 PLUGGED TUBE

Figure B.3.4
SG C Low Row U-Bend Plus Point Inspection Scope



SG - C HL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

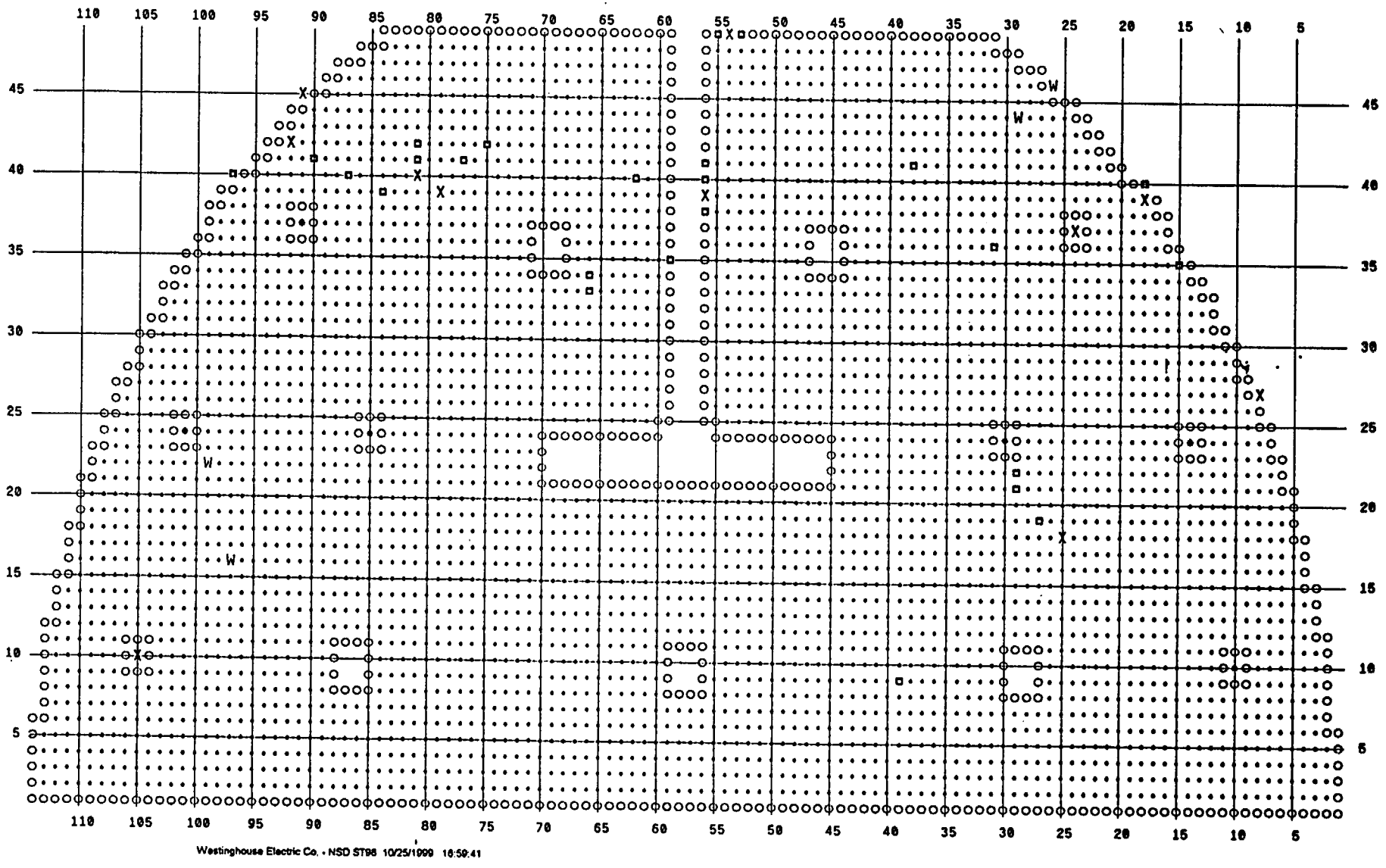
X 11 ROLL PLUG TO INSPECT

W 4 WELD PLUG TO INSPECT

▫ 25 PLUGGED TUBE

* 6 PLUGGED STUB TUBE

Figure B.3.5
SG C Hot Leg Plug Visual Inspection Scope



SG - C CL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

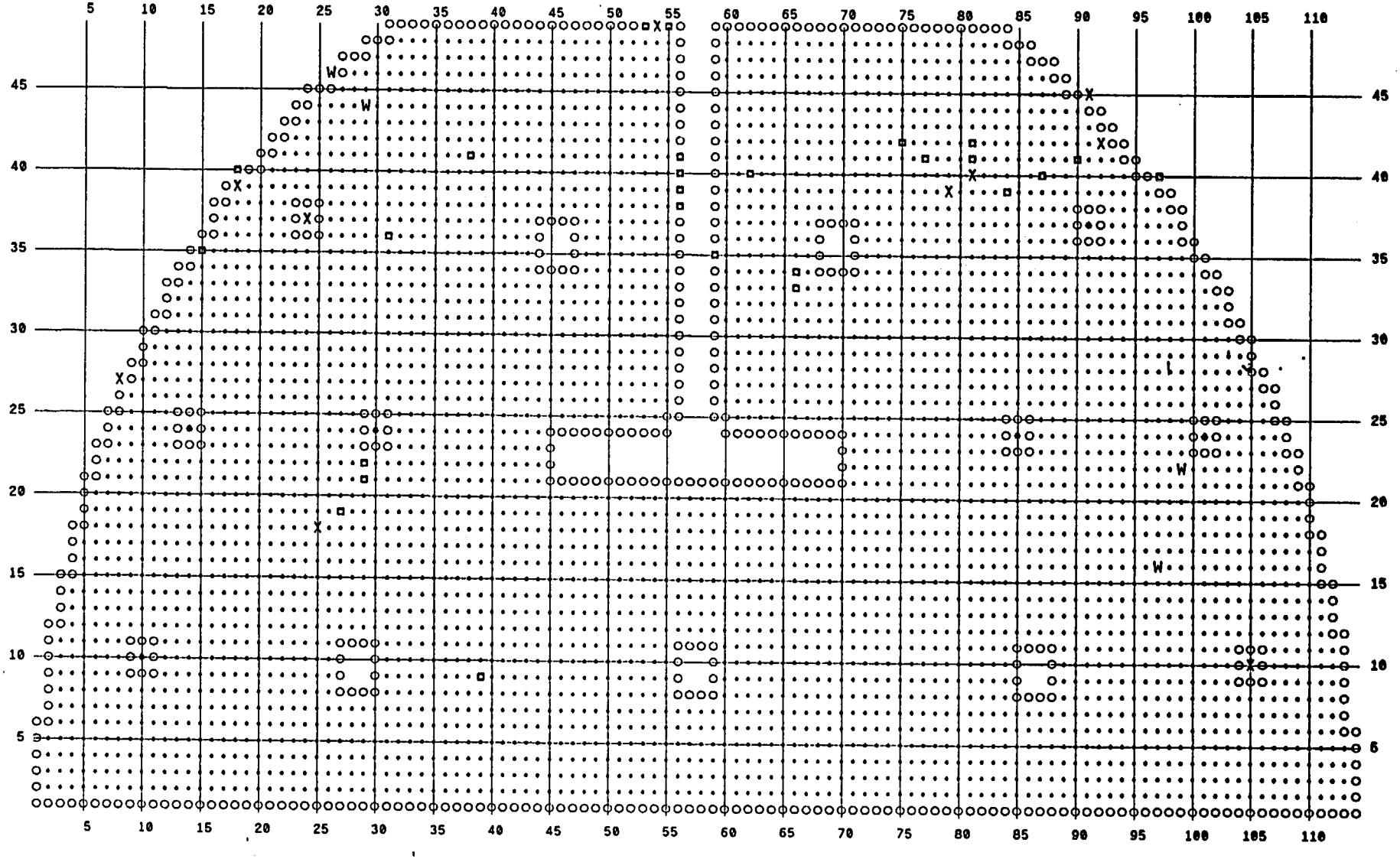
X 10 ROLL PLUG TO INSPECT

W 4 WELD PLUG TO INSPECT

▫ 26 PLUGGED TUBE

* 6 PLUGGED STUB TUBE

Figure B.3.6
SG C Cold Leg Plug Visual Inspection Scope



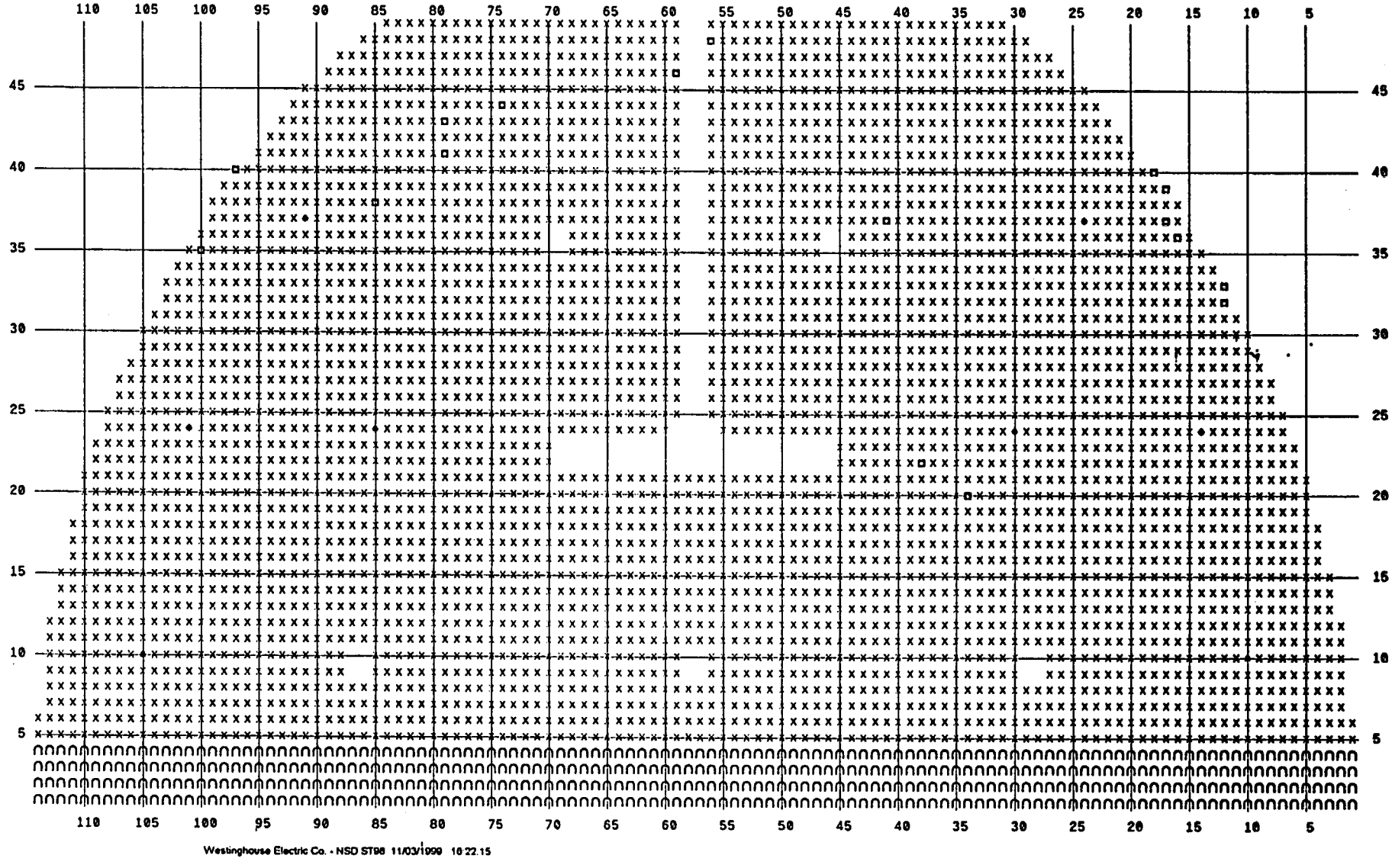
Westinghouse Electric Co. - NSD ST98 10/25/1999 16:59:02

SG - D CL Bobbin Program as Tested

Cold Leg

Byron B2R08 CBE D5

Figure B.4.1
SG D Cold Leg Bobbin Coil Inspection Scope



SG - D HL Bobbin Program as Tested

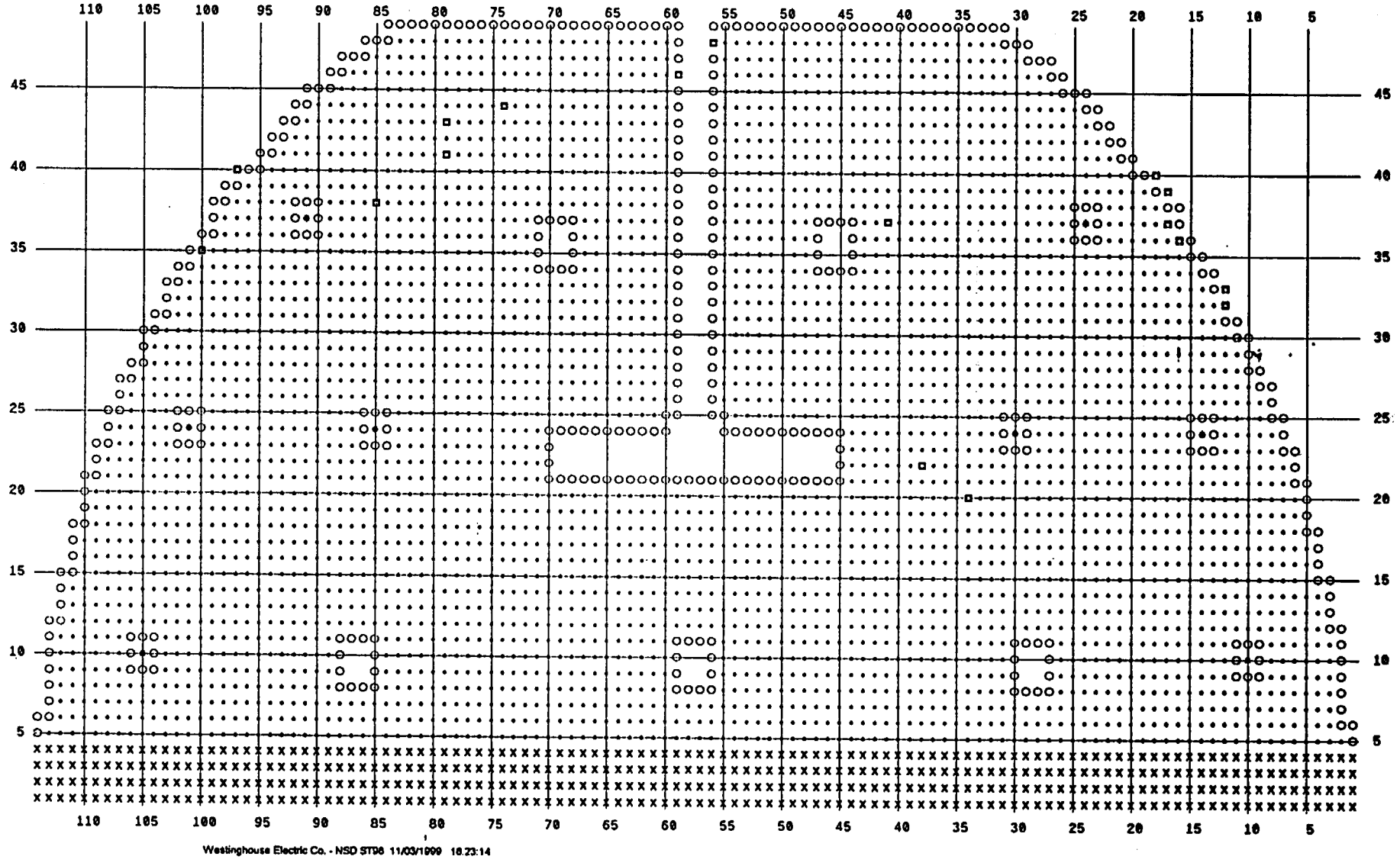
Hot Leg
Byron B2R08 CBE D5

x 456 TESTED STRAIGHT SECTION 11H - TEH WITH .610 BOBBIN

• 8 PLUGGED STUB TUBE

▫ 17 PLUGGED TUBE

Figure B.4.2
SG D Hot Leg Bobbin Coil Inspection Scope



SG - D HL TSH +PT Program as Tested

Byron B2R08 CBE D5

Figure B.4.3

SG D Hot Leg Top of Tubesheet

Plus Point Inspection Scope

X 1108 TESTED TSH +/- 3"

Σ 34 TESTED TSH THRU 01H

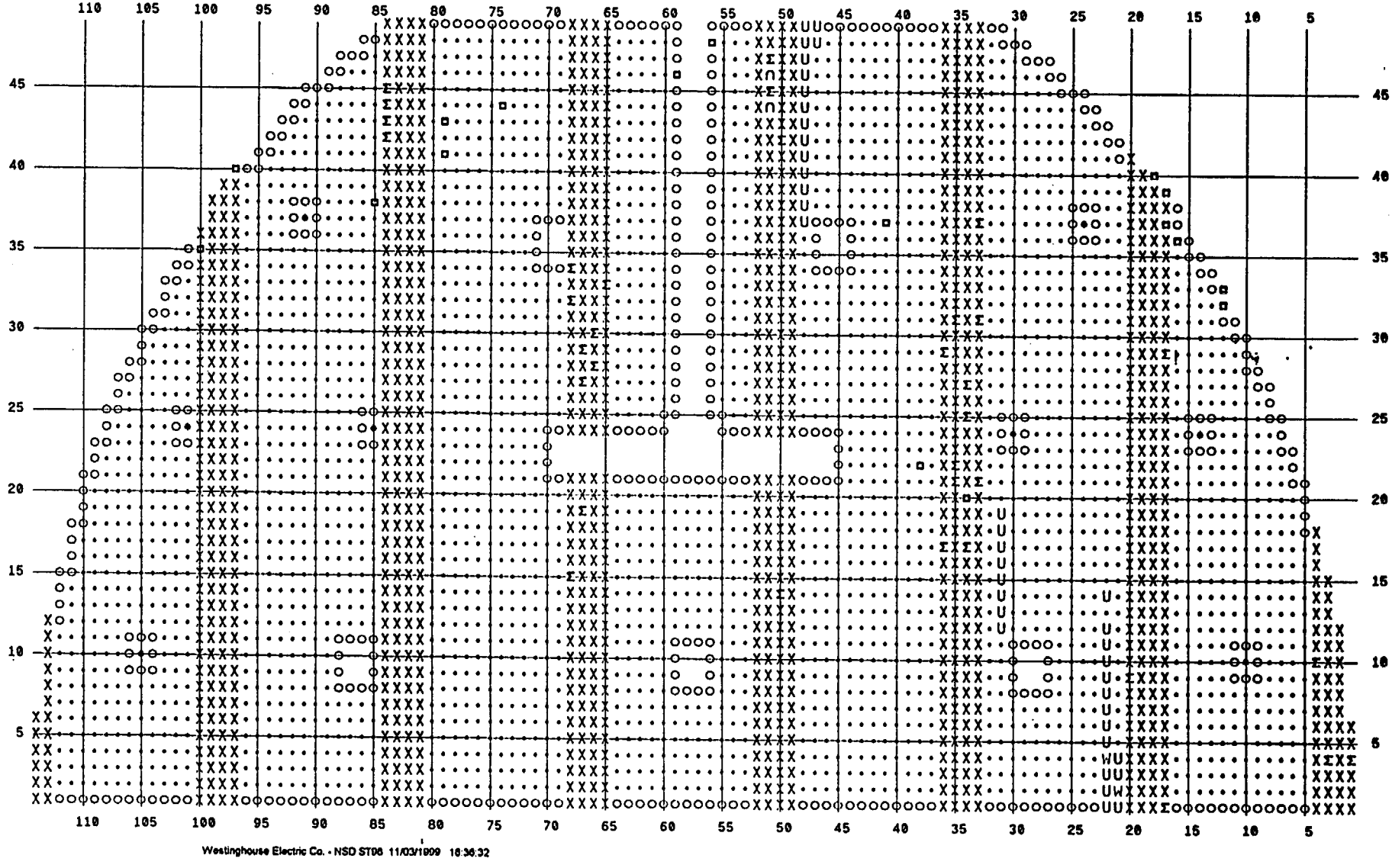
∩ 2 TESTED TSH THRU 03H

U 38 EXTRA TEST - TESTED TSH +/- 3"

W 2 EXTRA TEST - TESTED TSH THRU 01H

* 8 PLUGGED STUB TUBE

▫ 17 PLUGGED TUBE



SG - D HL +PT U-Bend Program as Tested

Hot Leg

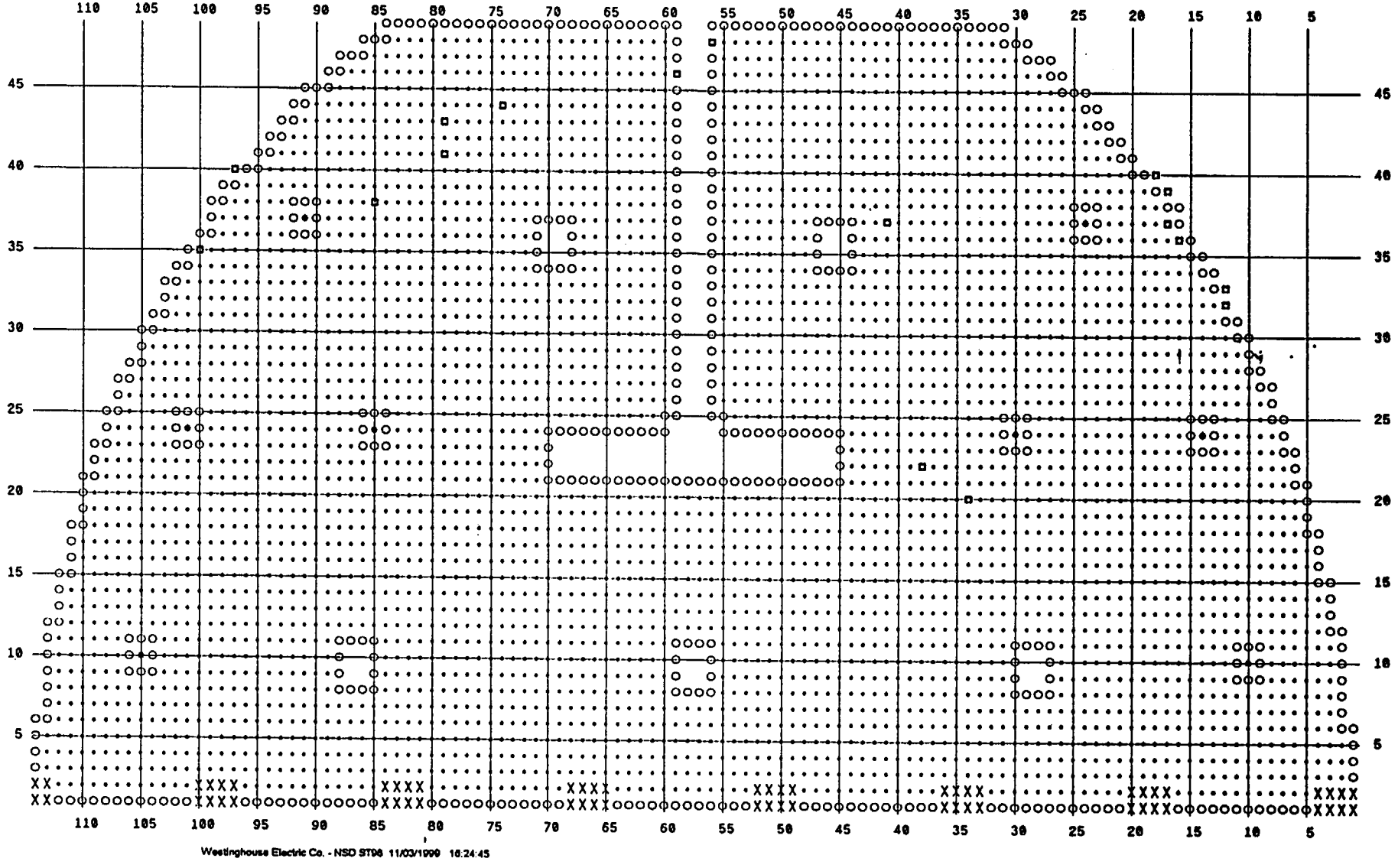
Byron B2R08 CBE D5

X 60 TESTED U-BEND 11C - 11H

* 8 PLUGGED STUB TUBE

▫ 17 PLUGGED TUBE

Figure B.4.4
SG D Low Row U-Bend Plus Point Inspection Scope



SG - D HL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

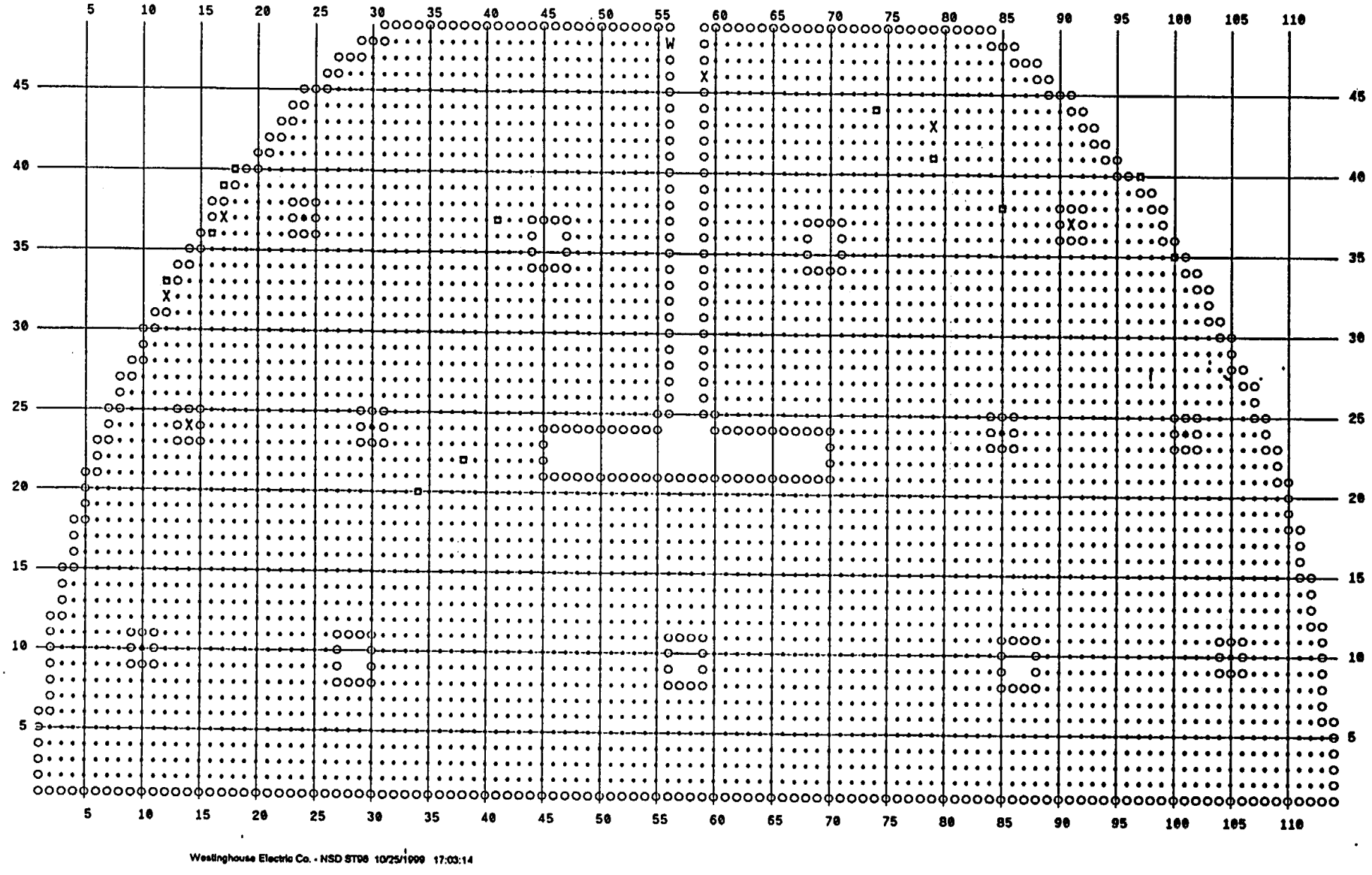
X 6 ROLL PLUG TO INSPECT

W 1 WELD PLUG TO INSPECT

▫ 12 PLUGGED TUBE

• 6 PLUGGED STUB TUBE

Figure B.4.5
SG D Hot Leg Plug Visual Inspection Scope



SG - D CL PLUG INSPECTION PROGRAM

Byron B2R08 CBE D5

X 6 ROLL PLUG TO INSPECT

W 1 WELD PLUG TO INSPECT

▫ 12 PLUGGED TUBE

• 6 PLUGGED STUB TUBE

Figure B.4.6
SG D Cold Leg Plug Visual Inspection Scope

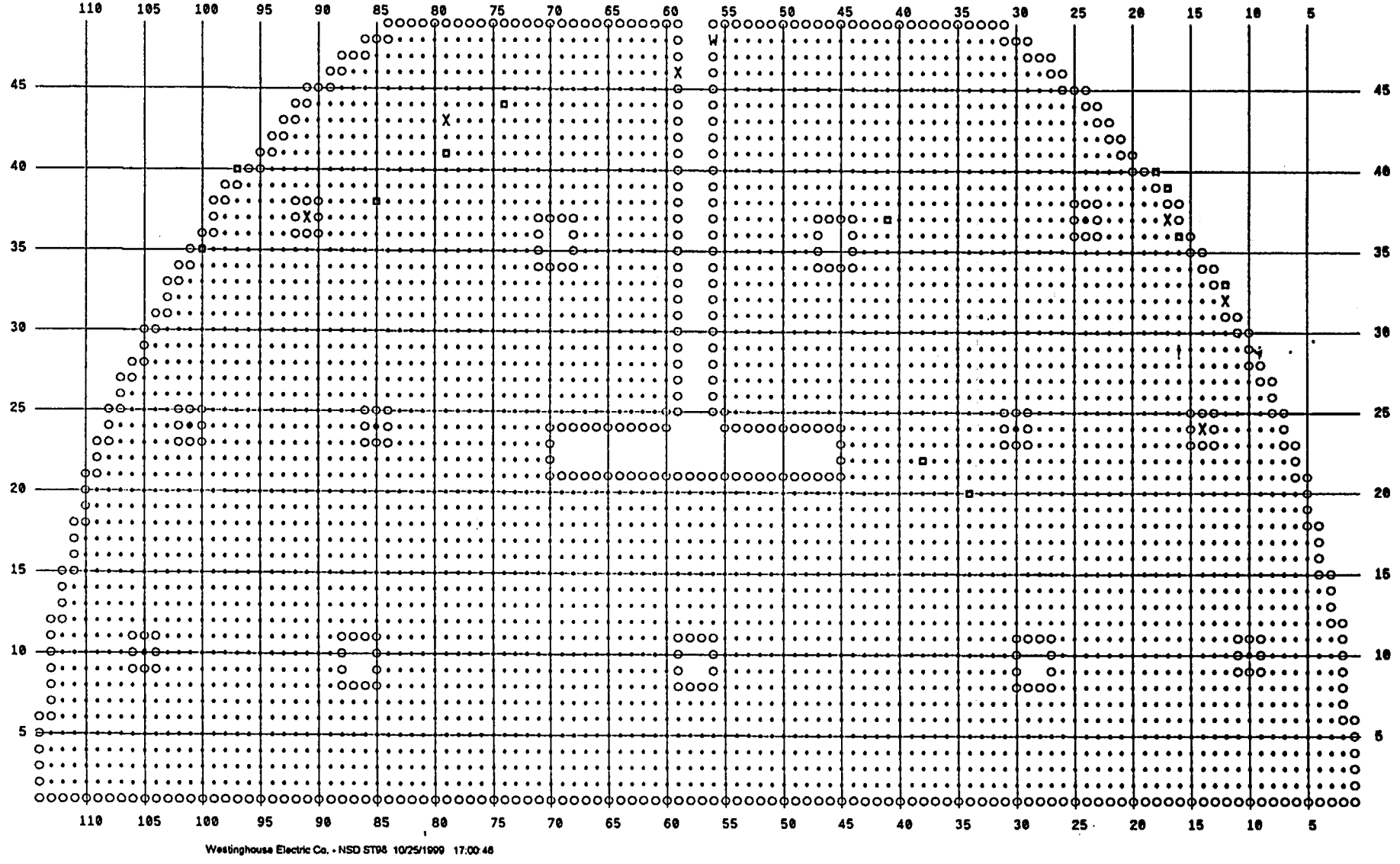


TABLE C.1.1
ASME SECTION XI FORM NIS-BB
2A Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BA**

Test Frequency: 20, 130, 300, 500 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
23	109	20	ODI	AV4	+0.00"
25	8	25	ODI	AV3	+0.00"
26	107	22	ODI	AV3	+0.00"
27	85	27	ODI	AV2	+0.00"
27	106	22	ODI	AV1	+0.00"
27	106	22	ODI	AV2	+0.00"
27	106	28	ODI	AV3	+0.00"
29	10	35	ODI	AV3	+0.00"
29	12	20	ODI	AV3	+0.00"
30	103	21	ODI	AV2	+0.00"
31	12	21	ODI	AV3	+0.00"
31	12	21	ODI	AV4	+0.00"
31	101	22	ODI	AV2	+0.00"
31	101	25	ODI	AV3	+0.00"
31	103	22	ODI	AV3	+0.00"
31	103	24	ODI	AV2	+0.00"
34	14	24	ODI	AV2	+0.00"
34	90	21	ODI	AV3	+0.00"
35	15	22	ODI	AV3	+0.00"
35	16	22	ODI	AV2	+0.00"
35	100	20	ODI	AV3	+0.00"
36	15	24	ODI	AV4	+0.00"
36	96	20	ODI	AV2	+0.00"
37	17	27	ODI	AV3	+0.00"
37	23	23	ODI	AV3	+0.00"
37	23	25	ODI	AV2	+0.00"
37	98	29	ODI	AV3	+0.00"
37	98	30	ODI	AV2	+0.00"
38	16	22	ODI	AV4	+0.00"
38	16	27	ODI	AV3	+0.00"
38	19	20	ODI	AV3	+0.00"
38	19	20	ODI	AV4	+0.00"
38	20	24	ODI	AV1	+0.00"
38	20	25	ODI	AV2	+0.00"
38	23	25	ODI	AV4	+0.00"
38	23	28	ODI	AV3	+0.00"
38	24	22	ODI	AV2	+0.00"
38	30	21	ODI	AV3	+0.00"
38	34	20	ODI	AV3	+0.00"
38	68	26	ODI	AV3	+0.00"
38	68	41	ODI	AV2	+0.00"

TABLE C.1.1
ASME SECTION XI FORM NIS-BB
2A Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BA**

Test Frequency: 20, 130, 300, 500 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
38	72	25	ODI	AV3	+0.00"
38	73	26	ODI	AV3	+0.00"
38	98	29	ODI	AV2	+0.00"
39	21	30	ODI	AV3	+0.00"
39	23	24	ODI	AV3	+0.00"
39	89	20	ODI	AV4	+0.00"
39	89	28	ODI	AV2	+0.00"
39	89	28	ODI	AV3	+0.00"
39	94	31	ODI	AV3	+0.00"
40	19	22	ODI	AV2	+0.00"
40	19	22	ODI	AV4	+0.00"
40	21	29	ODI	AV3	+0.00"
40	21	37	ODI	AV2	+0.00"
40	46	20	ODI	AV3	+0.00"
40	82	26	ODI	AV2	+0.00"
40	90	23	ODI	AV3	+0.00"
40	90	25	ODI	AV2	+0.00"
40	91	24	ODI	AV3	+0.00"
40	95	23	ODI	AV1	+0.00"
40	95	30	ODI	AV2	+0.00"
40	95	30	ODI	AV4	+0.00"
40	95	33	ODI	AV3	+0.00"
41	20	24	ODI	AV4	+0.00"
41	20	32	ODI	AV3	+0.00"
41	22	33	ODI	AV2	+0.00"
41	33	21	ODI	AV3	+0.00"
41	85	21	ODI	AV3	+0.00"
41	87	20	ODI	AV3	+0.00"
41	87	29	ODI	AV2	+0.00"
41	91	21	ODI	AV2	+0.00"
41	92	20	ODI	AV2	+0.00"
41	92	20	ODI	AV4	+0.00"
41	93	23	ODI	AV3	+0.00"
41	93	39	ODI	AV2	+0.00"
41	95	20	ODI	AV3	+0.00"
41	95	24	ODI	AV4	+0.00"
42	25	32	ODI	AV3	+0.00"
43	34	30	ODI	AV3	+0.00"
43	34	32	ODI	AV2	+0.00"
43	34	32	ODI	AV4	+0.00"
44	81	22	ODI	AV3	+0.00"

TABLE C.1.1
ASME SECTION XI FORM NIS-BB
2A Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BA**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
44	81	30	ODI	AV2	+0.00"
44	88	23	ODI	AV3	+0.00"
44	90	22	ODI	AV2	+0.00"
44	90	27	ODI	AV3	+0.00"
45	24	21	ODI	AV4	+0.00"
45	28	32	ODI	AV4	+0.00"
45	28	35	ODI	AV3	+0.00"
46	64	28	ODI	AV3	+0.00"
46	64	32	ODI	AV4	+0.00"
48	56	24	ODI	AV3	+0.00"

TABLE C.1.2
ASME SECTION XI FORM NIS-BB
2B Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BB**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
18	48	34	ODI	AV1	+0.00"
23	108	32	ODI	AV2	+0.00"
24	108	22	ODI	AV4	+0.00"
25	103	22	ODI	AV2	+0.00"
25	104	23	ODI	AV2	+0.00"
25	107	23	ODI	AV3	+0.00"
25	108	28	ODI	AV4	+0.00"
26	105	30	ODI	AV3	+0.00"
27	10	20	ODI	AV2	+0.00"
27	31	22	ODI	AV4	+0.00"
27	105	30	ODI	AV2	+0.00"
28	11	30	ODI	AV3	+0.00"
28	12	20	ODI	AV2	+0.00"
28	29	22	ODI	AV3	+0.00"
28	32	20	ODI	AV2	+0.00"
28	37	20	ODI	AV3	+0.00"
28	79	21	ODI	AV3	+0.00"
28	102	23	ODI	AV3	+0.00"
28	103	23	ODI	AV3	+0.00"
28	104	22	ODI	AV3	+0.00"
28	104	26	ODI	AV2	+0.00"
29	105	25	ODI	AV4	+0.00"
30	102	28	ODI	AV2	+0.00"
30	105	29	ODI	AV4	+0.00"
31	12	22	ODI	AV2	+0.00"
31	12	26	ODI	AV1	+0.00"
31	12	26	ODI	AV3	+0.00"
31	12	28	ODI	AV4	+0.00"
31	13	22	ODI	AV4	+0.00"
31	15	25	ODI	AV2	+0.00"
31	34	21	ODI	AV3	+0.00"
31	102	20	ODI	AV3	+0.00"
32	12	28	ODI	AV2	+0.00"
32	28	20	ODI	AV3	+0.00"
32	28	29	ODI	AV2	+0.00"
32	32	20	ODI	AV2	+0.00"
32	32	31	ODI	AV3	+0.00"
32	40	20	ODI	AV2	+0.00"
32	40	23	ODI	AV3	+0.00"
32	98	20	ODI	AV3	+0.00"
33	13	21	ODI	AV1	+0.00"

TABLE C.1.2
ASME SECTION XI FORM NIS-BB
2B Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BB**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
33	14	26	ODI	AV2	+0.00"
33	14	30	ODI	AV1	+0.00"
33	97	32	ODI	AV3	+0.00"
33	99	20	ODI	AV1	+0.00"
33	99	23	ODI	AV3	+0.00"
33	99	26	ODI	AV2	+0.00"
34	14	22	ODI	AV3	+0.00"
34	26	24	ODI	AV3	+0.00"
34	30	20	ODI	AV3	+0.00"
34	33	23	ODI	AV2	+0.00"
34	36	21	ODI	AV2	+0.00"
34	39	21	ODI	AV2	+0.00"
35	15	31	ODI	AV2	+0.00"
35	16	25	ODI	AV3	+0.00"
35	96	26	ODI	AV3	+0.00"
35	97	34	ODI	AV3	+0.00"
35	98	21	ODI	AV1	+0.00"
35	98	25	ODI	AV4	+0.00"
35	100	23	ODI	AV4	+0.00"
35	100	27	ODI	AV2	+0.00"
35	101	29	ODI	AV4	+0.00"
35	101	35	ODI	AV3	+0.00"
36	16	25	ODI	AV3	+0.00"
36	20	23	ODI	AV2	+0.00"
36	23	26	ODI	AV2	+0.00"
36	78	23	ODI	AV3	+0.00"
36	88	22	ODI	AV3	+0.00"
36	94	22	ODI	AV2	+0.00"
37	92	33	ODI	AV2	+0.00"
37	93	29	ODI	AV3	+0.00"
37	95	20	ODI	AV3	+0.00"
38	44	22	ODI	AV1	+0.00"
38	44	40	ODI	AV3	+0.00"
38	44	40	ODI	AV4	+0.00"
38	44	41	ODI	AV2	+0.00"
38	71	32	ODI	AV3	+0.00"
38	93	20	ODI	AV3	+0.00"
38	95	22	ODI	AV2	+0.00"
38	95	24	ODI	AV3	+0.00"
38	95	26	ODI	AV4	+0.00"
38	95	33	ODI	AV1	+0.00"

TABLE C.1.2
ASME SECTION XI FORM NIS-BB
2B Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BB**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
38	96	26	ODI	AV2	+0.00"
38	96	29	ODI	AV4	+0.00"
38	96	30	ODI	AV1	+0.00"
39	19	29	ODI	AV3	+0.00"
39	19	33	ODI	AV2	+0.00"
39	26	25	ODI	AV2	+0.00"
39	39	26	ODI	AV2	+0.00"
39	92	23	ODI	AV4	+0.00"
39	93	25	ODI	AV3	+0.00"
39	94	33	ODI	AV3	+0.00"
39	95	22	ODI	AV3	+0.00"
39	95	22	ODI	AV4	+0.00"
39	95	24	ODI	AV2	+0.00"
39	96	20	ODI	AV1	+0.00"
39	96	39	ODI	AV2	+0.00"
40	18	39	ODI	AV2	+0.00"
40	18	39	ODI	AV3	+0.00"
40	20	22	ODI	AV2	+0.00"
40	20	26	ODI	AV3	+0.00"
40	24	20	ODI	AV2	+0.00"
40	26	22	ODI	AV2	+0.00"
40	27	26	ODI	AV3	+0.00"
40	34	23	ODI	AV2	+0.00"
40	59	21	ODI	AV3	+0.00"
40	61	33	ODI	AV4	+0.00"
40	61	35	ODI	AV2	+0.00"
40	61	42	ODI	AV3	+0.00"
40	91	24	ODI	AV2	+0.00"
40	92	30	ODI	AV3	+0.00"
40	94	35	ODI	AV2	+0.00"
41	43	27	ODI	AV1	+0.00"
41	43	29	ODI	AV2	+0.00"
41	43	35	ODI	AV3	+0.00"
41	56	28	ODI	AV4	+0.00"
41	56	34	ODI	AV3	+0.00"
41	56	49	ODI	AV2	+0.00"
41	87	23	ODI	AV1	+0.00"
41	87	23	ODI	AV3	+0.00"
41	87	25	ODI	AV2	+0.00"
41	93	26	ODI	AV2	+0.00"
41	93	26	ODI	AV4	+0.00"

TABLE C.1.2
ASME SECTION XI FORM NIS-BB
2B Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BB**

Test Frequency: 20, 130, 300, 500 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
41	93	27	ODI	AV3	+0.00"
41	95	29	ODI	AV3	+0.00"
41	95	35	ODI	AV2	+0.00"
42	30	24	ODI	AV2	+0.00"
42	30	29	ODI	AV1	+0.00"
42	30	35	ODI	AV3	+0.00"
42	34	24	ODI	AV2	+0.00"
42	36	21	ODI	AV2	+0.00"
42	37	27	ODI	AV2	+0.00"
42	37	33	ODI	AV3	+0.00"
42	44	33	ODI	AV3	+0.00"
42	68	22	ODI	AV3	+0.00"
42	68	23	ODI	AV2	+0.00"
42	86	23	ODI	AV2	+0.00"
42	89	24	ODI	AV3	+0.00"
42	89	31	ODI	AV2	+0.00"
42	89	32	ODI	AV1	+0.00"
43	25	23	ODI	AV2	+0.00"
43	29	22	ODI	AV1	+0.00"
43	29	36	ODI	AV2	+0.00"
43	91	26	ODI	AV3	+0.00"
43	92	24	ODI	AV3	+0.00"
44	26	22	ODI	AV3	+0.00"
44	26	29	ODI	AV2	+0.00"
44	45	24	ODI	AV3	+0.00"
44	76	20	ODI	AV3	+0.00"
44	76	27	ODI	AV2	+0.00"
44	85	21	ODI	AV2	+0.00"
44	85	23	ODI	AV4	+0.00"
44	85	35	ODI	AV3	+0.00"
44	90	30	ODI	AV3	+0.00"
45	26	25	ODI	AV4	+0.00"
45	26	30	ODI	AV2	+0.00"
45	26	36	ODI	AV3	+0.00"
45	32	22	ODI	AV2	+0.00"
45	32	29	ODI	AV3	+0.00"
45	36	27	ODI	AV3	+0.00"
45	36	33	ODI	AV4	+0.00"
45	83	20	ODI	AV4	+0.00"
45	83	23	ODI	AV2	+0.00"
45	83	24	ODI	AV3	+0.00"

TABLE C.1.2
ASME SECTION XI FORM NIS-BB
2B Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BB**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
45	86	22	ODI	AV3	+0.00"
45	86	27	ODI	AV2	+0.00"
45	89	28	ODI	AV2	+0.00"
47	27	26	ODI	AV3	+0.00"
47	27	33	ODI	AV2	+0.00"
47	27	33	ODI	AV4	+0.00"
47	56	28	ODI	AV2	+0.00"
47	76	44	ODI	02C	+0.57
49	51	28	ODI	07C	+0.00

TABLE C.1.3
ASME SECTION XI FORM NIS-BB
2C Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BC**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
23	6	25	ODI	AV4	+0.00"
25	107	20	ODI	AV4	+0.00"
25	108	20	ODI	AV1	+0.00"
26	8	20	ODI	AV2	+0.00"
26	9	26	ODI	AV4	+0.00"
27	106	21	ODI	AV2	+0.00"
27	106	33	ODI	AV3	+0.00"
28	35	22	ODI	AV3	+0.00"
28	35	23	ODI	AV4	+0.00"
28	84	24	ODI	AV3	+0.00"
28	103	23	ODI	AV3	+0.00"
29	11	23	ODI	AV1	+0.00"
29	29	23	ODI	AV3	+0.00"
30	35	22	ODI	AV3	+0.00"
30	104	20	ODI	AV2	+0.00"
31	14	21	ODI	AV3	+0.00"
32	13	22	ODI	AV3	+0.00"
32	79	21	ODI	AV3	+0.00"
32	82	24	ODI	AV2	+0.00"
32	83	23	ODI	AV3	+0.00"
34	27	29	ODI	AV2	+0.00"
34	29	22	ODI	AV2	+0.00"
35	18	20	ODI	AV2	+0.00"
35	22	24	ODI	AV3	+0.00"
35	25	20	ODI	AV3	+0.00"
35	25	23	ODI	AV2	+0.00"
35	30	20	ODI	AV2	+0.00"
35	82	22	ODI	AV3	+0.00"
35	85	23	ODI	AV2	+0.00"
35	85	32	ODI	AV3	+0.00"
35	86	31	ODI	AV2	+0.00"
36	19	27	ODI	AV3	+0.00"
36	20	22	ODI	AV3	+0.00"
36	21	29	ODI	AV3	+0.00"
36	22	23	ODI	AV3	+0.00"
36	24	25	ODI	AV3	+0.00"
36	80	21	ODI	AV3	+0.00"
36	96	21	ODI	AV2	+0.00"
37	84	20	ODI	AV3	+0.00"
37	99	23	ODI	AV3	+0.00"
37	99	40	ODI	AV2	+0.00"

TABLE C.1.3
ASME SECTION XI FORM NIS-BB
2C Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BC**

Test Frequency: 20, 130, 300, 500 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
38	16	21	ODI	AV1	+0.00"
38	16	24	ODI	AV2	+0.00"
38	22	24	ODI	AV1	+0.00"
38	25	21	ODI	AV2	+0.00"
38	62	20	ODI	AV3	+0.00"
38	62	23	ODI	AV2	+0.00"
39	19	26	ODI	AV3	+0.00"
39	35	31	ODI	AV2	+0.00"
39	35	31	ODI	AV3	+0.00"
39	83	25	ODI	AV2	+0.00"
40	21	30	ODI	AV2	+0.00"
40	83	24	ODI	AV3	+0.00"
40	83	27	ODI	AV2	+0.00"
40	93	26	ODI	AV3	+0.00"
40	95	20	ODI	AV1	+0.00"
40	95	27	ODI	AV3	+0.00"
41	21	22	ODI	AV2	+0.00"
41	21	41	ODI	AV3	+0.00"
41	26	22	ODI	AV3	+0.00"
41	63	20	ODI	AV1	+0.00"
41	63	20	ODI	AV3	+0.00"
41	63	30	ODI	AV2	+0.00"
41	84	20	ODI	AV3	+0.00"
41	88	22	ODI	AV2	+0.00"
41	88	22	ODI	AV3	+0.00"
41	89	23	ODI	AV2	+0.00"
41	89	27	ODI	AV4	+0.00"
41	89	29	ODI	AV1	+0.00"
41	89	33	ODI	AV3	+0.00"
41	92	21	ODI	AV4	+0.00"
41	92	34	ODI	AV3	+0.00"
42	25	21	ODI	AV3	+0.00"
42	29	26	ODI	AV3	+0.00"
42	86	24	ODI	AV2	+0.00"
42	86	26	ODI	AV3	+0.00"
42	89	36	ODI	AV3	+0.00"
42	90	30	ODI	AV3	+0.00"
42	93	29	ODI	AV1	+0.00"
42	93	33	ODI	AV3	+0.00"
42	94	30	ODI	AV3	+0.00"
43	36	26	ODI	AV3	+0.00"

TABLE C.1.3
ASME SECTION XI FORM NIS-BB
2C Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BC**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
43	93	20	ODI	AV1	+0.00"
43	93	22	ODI	AV2	+0.00"
44	74	20	ODI	AV1	+0.00"
44	74	34	ODI	AV3	+0.00"
44	74	41	ODI	AV2	+0.00"
48	43	21	ODI	AV3	+0.00"

TABLE C.1.4
ASME SECTION XI FORM NIS-BB
2D Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BD**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
26	70	20	ODI	AV2	+0.00"
26	107	20	ODI	AV3	+0.00"
28	36	20	ODI	AV2	+0.00"
31	103	20	ODI	AV2	+0.00"
36	17	20	ODI	AV2	+0.00"
37	87	20	ODI	AV3	+0.00"
38	25	20	ODI	AV3	+0.00"
40	29	20	ODI	AV3	+0.00"
40	33	20	ODI	AV2	+0.00"
40	92	20	ODI	AV3	+0.00"
41	33	20	ODI	AV2	+0.00"
41	86	20	ODI	AV2	+0.00"
47	56	20	ODI	AV3	+0.00"
25	108	21	ODI	AV4	+0.00"
31	104	21	ODI	AV3	+0.00"
34	87	21	ODI	AV3	+0.00"
35	14	21	ODI	AV3	+0.00"
36	82	21	ODI	AV4	+0.00"
41	20	21	ODI	AV1	+0.00"
42	36	21	ODI	AV3	+0.00"
31	13	22	ODI	AV3	+0.00"
31	103	22	ODI	AV3	+0.00"
36	21	22	ODI	AV2	+0.00"
36	72	22	ODI	AV2	+0.00"
37	33	22	ODI	AV2	+0.00"
39	80	23	ODI	AV3	+0.00"
40	76	23	ODI	AV2	+0.00"
40	90	23	ODI	AV3	+0.00"
30	103	24	ODI	AV2	+0.00"
31	84	24	ODI	AV2	+0.00"
35	17	24	ODI	AV2	+0.00"
39	72	24	ODI	AV2	+0.00"
40	33	24	ODI	AV3	+0.00"
28	28	25	ODI	AV4	+0.00"
31	44	25	ODI	AV3	+0.00"
34	97	25	ODI	AV2	+0.00"
36	37	25	ODI	AV3	+0.00"
36	83	25	ODI	AV2	+0.00"
48	59	25	ODI	AV3	+0.00"
28	11	26	ODI	AV2	+0.00"
31	50	26	ODI	AV3	+0.00"

TABLE C.1.4
ASME SECTION XI FORM NIS-BB
2D Steam Generator

FORM NIS-BB TUBE EXAMINATION REPORT

EDDY CURRENT EXAMINATION RESULTS

Site: Byron Station, Unit 2 **Steam Generator: 2RC01BD**

Test Frequency: 20, 130, 300, 600 kHz **Date: 12/20/1999**

Row	Column	% Tube Wall Penetration	Origin	Location	Inch
35	20	26	ODI	AV2	+0.00"
37	33	26	ODI	AV3	+0.00"
37	42	26	ODI	AV2	+0.00"
39	90	26	ODI	AV4	+0.00"
41	20	26	ODI	AV2	+0.00"
41	80	26	ODI	AV1	+0.00"
35	14	27	ODI	AV4	+0.00"
39	72	27	ODI	AV3	+0.00"
40	29	27	ODI	AV2	+0.00"
36	82	28	ODI	AV2	+0.00"
47	56	28	ODI	AV4	+0.00"
25	50	29	ODI	AV2	+0.00"
35	95	29	ODI	AV2	+0.00"
36	37	29	ODI	AV2	+0.00"
43	34	30	ODI	AV1	+0.00"
42	36	31	ODI	AV2	+0.00"
31	44	32	ODI	AV2	+0.00"
43	34	33	ODI	AV4	+0.00"
41	86	35	ODI	AV3	+0.00"
34	99	37	ODI	AV4	+0.00"
30	11	43	ODI	AV3	+0.00"
43	34	46	ODI	AV2	+0.00"
43	34	50	ODI	AV3	+0.00"

TABLE D.1:
SG TUBES REPAIRED DURING B2R08

No.	SG	Row	Col.	Repair	Stabilizer	Indication	Volts	Channel	Phase	Location
1	2A	38	68	Plug	-	41%	4.94	M2	0	AV2+0.0"
2	2B	14	6	Plug	Hot Leg	PLP	1.23	11	265	05H+0.60"
3	2B	15	5	Plug	Hot Leg	SVI	0.12	2	98	05H+0.69"
4	2B	15	6	Plug	Hot Leg	SVI	0.18	2	112	05H+0.60"
5	2B	38	44	Plug	-	41% 40% 40% 22%	6.45 6.16 5.91 1.85	M2 M2 M2 M2	0 0 0 0	AV2+0.0" AV3+0.0" AV4+0.0" AV1+0.0"
6	2B	40	61	Plug	-	42% 35% 33%	6.72 4.32 3.82	M2 M2 M2	0 0 0	AV3+0.0" AV2+0.0" AV4+0.0"
7	2B	41	56	Plug	-	49% 34% 28% 15%	9.41 4.31 2.88 1.19	M2 M2 M2 M2	0 0 0 0	AV2+0.0" AV3+0.0" AV4+0.0" AV1+0.0"
8	2B	47	76	Plug	-	SVI (44%)	1.78	2	76	02C+0.33"
9	2B	49	51	Plug	Cold Leg	28%	1.79	M3	0	07C+0.0"
10	2C	37	99	Plug	-	40% 23% 16%	4.83 2.03 1.36	M2 M2 M2	0 0 0	AV2+0.0" AV3+0.0" AV4+0.0"
11	2C	41	21	Plug	-	41% 22%	5.25 1.74	M2 M2	0 0	AV3+0.0" AV2+0.0"
12	2C	44	74	Plug	-	41% 34% 20% 18%	5.32 3.31 1.20 1.02	M2 M2 M2 M2	0 0 0 0	AV2+0.0" AV3+0.0" AV1+0.0" AV4+0.0"
13	2D	30	11	Plug	-	43% 16% 15%	5.51 1.22 1.08	M2 M2 M2	0 0 0	AV3+0.0" AV2+0.0" AV4+0.0"
14	2D	43	34	Plug	-	50% 46% 33% 30%	8.71 6.28 3.24 2.76	M2 M2 M2 M2	0 0 0 0	AV3+0.0" AV2+0.0" AV4+0.0" AV1+0.0"

PLP – Possible Loose Part
SVI – Single volumetric Indication
AV – Anti-Vibration Bar
*H – Tube Support Plate on Hot Leg Side
*C – Tube Support Plat on Cold Leg Side
M* - Suppression Mix

FIGURE D.1
FORM NIS-1 OWNER'S REPORT FOR INSERVICE INSPECTIONS
As Required by the Provisions of the ASME Code Rules

1. Owner: Commonwealth Edison Company (ComEd) P.O.Box 767, Chicago, Illinois 60690
(Name and Address of Owner)

2. Plant: Byron Station, 4450 North German Church Road, Byron, Illinois, 61010
(Name and Address of Plant)

3. Plant Unit: Two (2)

4. Owner Certificate of Authorization (if required): N/A

5. Commercial Service Date: 08/21/87

6. National Board Number for Unit: N-200

7. Components Inspected: Steam Generator Eddy Current Inspection

Component or Appurtenance	Manufacturer or Installer	Manufacturer or Installer Serial No.	State or Province No.	National Board No.
2RC01BA	Westinghouse	2095	U-201435	15
2RC01BB	Westinghouse	2096	U-201436	16
2RC01BC	Westinghouse	2097	U-201437	17
2RC01BD	Westinghouse	2098	U-201438	18

Note: This is a computer generated form

FORM NIS-1 (Back)

8. Examination Dates 10/27/99 to 11/04/99 9. Inspection Interval from 08/21/98 (extended) to 08/21/07

10. Abstract of Examinations. Include a list of examinations and a statement concerning status of work required for current interval.

Refer to the Attached Eddy Current Report

11. Abstract of Conditions Noted

Refer to the Attached Eddy Current Report

12. Abstract of Corrective Measures Recommended and Taken

Refer to the Attached Eddy Current Report

We certify that the statements made in this report are correct and the examinations and corrective measures taken conform to the rules of the ASME Code, Section XI.

Certificate of Authorization No. (if applicable) Not Applicable Expiration Date Not Applicable

Date 2/1/00 Signed For ComEd Owner By

CERTIFICATE OF INSERVICE INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of Illinois and employed by HSB I+I Co. of Hartford, Connecticut have inspected the components described in this Owner's Report during the period 10/27/99 to 11/4/99, and state that to the best of my knowledge and belief, the Owner has performed examinations and taken corrective measures described in this Owner's Report in accordance with the requirements of the ASME Code, Section XI.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the examinations and corrective measures described in this Owner's Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this inspection.

J.L. VanMeter Commissions IL-1254

Inspector's Signature National Board, State, Province, and Endorsements

Date February 1, 2000

Note: This is a computer generated form