Technical Specification 5.6.8

Palo Verde Nuclear Generating Station

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U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Palo Verde Nuclear Generating Station (PVNGS) Unit 1
Docket No. STN 50-528
License No. NPF-41
Steam Generator Tube Inspection Report

Attached please find the PVNGS Unit 1 Steam Generator Tube Inspection Report prepared and submitted by Arizona Public Service Company (APS) pursuant to Technical Specification (TS) Reporting Requirement 5.6.8. This report describes steam generator tube inspection and plugging results from the Unit 1 fifteenth refueling outage.

By copy of this letter, this submittal is being provided to the NRC Region IV Administrator and the PVNGS Resident Inspector. No commitments are being made to the NRC by this letter.

Should you have questions regarding this submittal, please contact Russell A. Stroud, Licensing Section Leader, at (623) 393-5111.

Sincerely,

Thomas N. Weber

TNW/RAS/CJS/gat

Attachment

cc: (with attachment)

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J. R. Hall	NRC NRR Senior Project Manager
L. K. Gibson	NRC NRR Project Manager
J. H. Bashore	NRC Senior Resident Inspector (acting) for PVNGS

A001
NRR

Attachment

Unit 1 – 15th Refueling Outage
Steam Generator Tube Inspection Report

Palo Verde Nuclear Generating Station

UNIT 1
U1R15

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Report Date: _____

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UNIT 1

STEAM GENERATOR EDDY CURRENT

U1 R15 Refueling Outage

1.0 Summary

This report is intended to satisfy the requirements of PVNGS Technical Specifications 5.6.8 for the submittal of a Steam Generator Tube Inspection Report. The steam generator (SG) eddy current examination for the 15th refueling outage in Unit 1 (U1R15) was conducted during April 2010. Mode 4 entry of Unit 1 Cycle 16 was entered on May 18, 2010. The initial examination plan for both steam generators is listed in Table 1. This table summarizes the examinations performed for each of the various categories, examination types, extents, and the number of tubes or tube locations completed. This was the third examination performed in Unit 1 following steam generator replacement in U1R12. This examination is considered a 100% full length tubing inspection.

The examinations resulted in a total of **18** tubes being plugged in SG 11, and **22** tubes being plugged in SG 12. A description of the previous plugging history is noted in Table 2, and Appendix E provides a map of all tubes plugged.

2.0 Scope of Examinations Performed

The original examination plan was developed based on the "PVNGS Steam Generator Degradation Assessment" developed per PVNGS Procedure 81DP-9RC01 as required by NEI 97-06. In addition, possible damage mechanisms were reviewed along with the specific requirements set forth in Procedure 73TI-9RC01 and the PVNGS Technical Specifications. The plan was finalized to include 100% bobbin examinations.

This original plan, along with the examinations performed as a result of bobbin indications noted, is summarized in Table 1 of this report.

3.0 Active Degradation Mechanisms

The only degradation noted during the examinations was determined to be wear. Section 8.0 contains further discussions relating to this mechanism. Table 2 summarizes the results into categories and sections B and C itemizes all indications reported.

4.0 NDE Techniques Utilized

The following table documents the site qualified techniques utilized during this outage:

BOBBIN Examination								
Damage Mechanism	**Location**	**ETSS NO**	**QUAL STATUS**	ORIENTATION	**BC DET**	**BC SIZE**	**TECH**	**Comment**
Wear	BWs, VSs, ECs,	96004.1 Rev. 12 2-2009	SITE QUALIFIED	NA	Y	Y	Volt DIFF	None
Wear	Loose Part	27091.2 Rev. 0 8-2007	SITE QUALIFIED	NA	Y	N	Volt DIFF	None

Rotating Coil Examinations								
Damage Mechanism	**Location**	**ETSS NO**	**QUAL STATUS**	ORIENTATION	**RC DET**	**RC SIZE**	**TECH**	**Comment**
Wear	BWs, ECs, VSs	96910.1 Rev. 10 8-2006	SITE QUALIFIED	NA	Y	Y	+POINT	None

The eddy current examinations were performed by Westinghouse Electric Company using the Core Star OMNI 200 eddy current instrument. Westinghouse Anser software was utilized to acquire the data along with the Pegasys robotic manipulator. This robot was configured with a dual guide tube in each of the hot and cold legs.

The tubing was examined with Zetec manufactured bobbin coil probes and Zetec rotating coil (RC) style probes. Probe diameters were 0.590" to 0.610". Plus Point RC probes were used for the characterization of non-quantifiable or distorted bobbin indications.

Fiber optic cable was used from containment to the data acquisition room located at the PVNGS North Annex. Primary and secondary analysis was all performed on site. The Primary and Secondary Resolution Analysts, Independent Review Analysts, and data management were also located at PVNGS in the North Annex. Westinghouse provided the data acquisition and secondary data analysis. Anatec International, Inc. provided the primary data analysis.

Each individual from Westinghouse and Anatec International, Inc. who performed data analysis was required to complete and pass a PVNGS site specific Eddy Current Data Analysis Course as well as an associated performance and written examination. All individuals performing data analysis were also required to have Qualified Data Analyst (QDA) certification.

5.0 Indication Summary

A detailed listing of the location and measured sizes of all indications recorded is included in Appendix B and C. A summary of these indication results is located in Table 2. In addition, Appendix A contains a reference drawing of steam generator support locations and report legend.

There were no indications that were identified as linear during this outage.

6.0 Tubes Plugged

A summary of the tubes plugged is located in Table 2. Only 18 tubes in SG 11 and 22 tubes in SG 12 were plugged this outage.

Appendix E contains a map that details the plugged tube location along with the previously plugged tubes.

7.0 Plug History

A summary of the number and percentage of tubes plugged is also located in Table 2.

8.0 Condition Monitoring

Per the Steam Generator Program, as defined in PVNGS Procedure 81DP-9RC01, a condition monitoring evaluation was conducted by PVNGS Engineering. The results of the eddy current examinations are provided in Section 5.0. An engineering evaluation of the as-found condition of inservice tubes did not reveal any degradation exceeding the threshold values for structural and leakage integrity. As such, all steam generator performance criteria were satisfied for Unit 1 Cycle 15. No tube pulls or insitu pressure testing were required based on the results of the examinations.

Tubesheet Annulus and Blowdown Lane Foreign Object Search and Retrieval (FOSAR) was conducted using a power cart mounted with a remotely operated camera and retrieval tooling. The applicable requirements of Revision 2 of the EPRI Steam Generator Integrity Assessment Guidelines Section 10.5, Secondary Side Visual Inspections, were applied for the FOSAR inspections. As expected, little sludge was observed in the tubesheet annulus region or the blowdown lane of either SG, since a sludge lancing was performed this outage. On the cold leg side of SG11, one (1) sludge rock was identified between tubes R153C60 and R155C60 and could not be removed when contacted, since it was wedged between the tubes. The sludge rock was not observed during eddy current examinations. The loose part location was ECT tested for possible wear indications (plus point and bobbin): no detection was reported. No loose parts were identified in the hot leg side of RSG 11.On the cold leg side of SG12 above the 90 degree handhole (between the divider plate and lug), a 4 1/4" long x 0.10" dia. wire was found and removed. On the hot leg side of SG12 in the vicinity of the 90 degree handhole, a sludge rock was found wedged into the divider plate and removed. Neither of these two parts were observed during eddy current examinations. Also on the hot leg side of SG12 in the blowdown lane near tube R1C138, a piece of what appeared to be weld splatter 1" x 1" x 1/16" was found and removed. Plus Point (rotating coil) inspections were subsequently conducted to further verify that no additional piece(s) were present at these locations. The plus point inspections revealed no additional objects. The exams also

confirmed no evidence of tube degradation. FOSAR also observed two small indications in SG 12 on tubes R1C178 and R2C179 just above the hot leg top of tubesheet in the blowdown lane. These flaws were also identified by bobbin eddy current testing. RPC testing confirmed volumetric degradation on these two tubes and another adjacent tube (R3C178). The deepest indication depth (R2 C179) was reported to be 41%TW. The reported depth of the indications on R1 C178 and R3 C178 was <40%TW. The indication depths were such that structural or leakage integrity was not challenged. All three tubes were plugged.

Also included in the scope of the FOSAR effort was an inspection of the blowdown patch plate welds that were found to be cracked in Unit 2 during U2R15. The inspections confirmed that all 4 patch plates (2 per SG) were cracked, and that the cracks were similar to those found in the Unit 2 SGs (i.e., the patch plate to lug weld was completely compromised and the patch plate to divider plate welds were completely intact). A previous evaluation concluded that there is a high probability that these cracked welds existed in the Unit 1 SGs. The evaluation concluded that, with the presence of the cracked welds, the patch plates in the Unit 1 SGs will continue to perform their design function and that the probability of loose parts being formed is remote. Thus, there is a very low risk that the cracked welds will affect the structural or leakage integrity of tubes in these steam generators.

As noted in Appendix D, there were 3 possible loose part (PLP) locations identified in Steam Generator 11 and 2 possible loose part (PLP) locations identified in Steam Generator 12. All of the PLP calls in SG11 were observed in the previous inspection (U1R14) with continued no evidence of wear (R164C75, R165C76, and R3C192). The locations are in areas not accessible by visual exams. Likewise, both of the PLP calls in SG12 were observed in the previous inspection (R105C104, R108C015). PVNGS has historically taken the position that if a loose part is detected by ECT or FOSAR, without the presence of wear, it is reasonable to conclude that the required conditions to promote wear do not exist. As a conservative measure, the affected and surrounding tubes were inspected with a supplemental and bounding rotating coil examination to confirm that no tube degradation exists. No additional action was required for these locations and the locations will be tracked for future inspections.

Finally, PVNGS Procedure 81DP-9RC01 requires, per the EPRI *PWR Steam Generator Examination Guidelines*, that a visual inspection of the previously installed steam generator plugs be performed to assess plug integrity. Additionally, the Examination Guidelines Section 6.10.1 states – "Verify the location and presence of existing in-service plugs." The conduct of the plug location and integrity verification was performed in U1R15 per procedure 81CP-9RC40. A review of the inspection results indicated that all plugs were accounted for and no evidence of potential plug leakage was identified.

TABLE 1
EXAMINATION SUMMARY

SCOPE DESCRIPTION		SG 11	SG 12
Exam Description	**Extents**	**Scope**	**Scope**
COLD LEG BOBBIN	TEC-VS3	11293	11292
HOT LEG BOBBIN	TEH-VS3	11293	11292
COLD STRAIGHT SECTION BOBBIN	TEC-08C TEC-BW1	952 276	952 278
HOT STRAIGHT SECTION BOBBIN	TEH-08H TEH-BW1	952 276	952 278
HOT STRAIGHT RC*	VARIOUS	5	10
HOT U & SQUARE BEND RC*	VARIOUS	127	141
COLD STRAIGHT RC*	VARIOUS	12	10
COLD U & SQUARE BEND RC*	VARIOUS	53	35

Notes: * RC examination performed to evaluated bobbin results.

TABLE 2

INDICATION SUMMARY

DAMAGE MECHANISM	STEAM GENERATOR 11	STEAM GENERATOR 12
WEAR		
1% - 20%	138	119
20% - 29%	13	20
30% - 39%	3	4
≥ 40%	0	0
PLUGGED	(18)	(19)
Possible Loose Parts (RC)		
PLI	0	0
PLP	3	2
PLUGGED	(0)	(0)
Volumetric Indications		
SVI/MVI	0	3
PLUGGED	(0)	(3)
PREVENTATIVE	(0)	(0)
PLUGGED	**(18)**	**(22)**
TOTAL PLUGGED / %	**(77 / 0.6%)**	**(80 / 0.6%)**

NOTES

1. Numbers in (X) are tubes numbers plugged in each category
2. The above represent the numbers of tubes; not indications

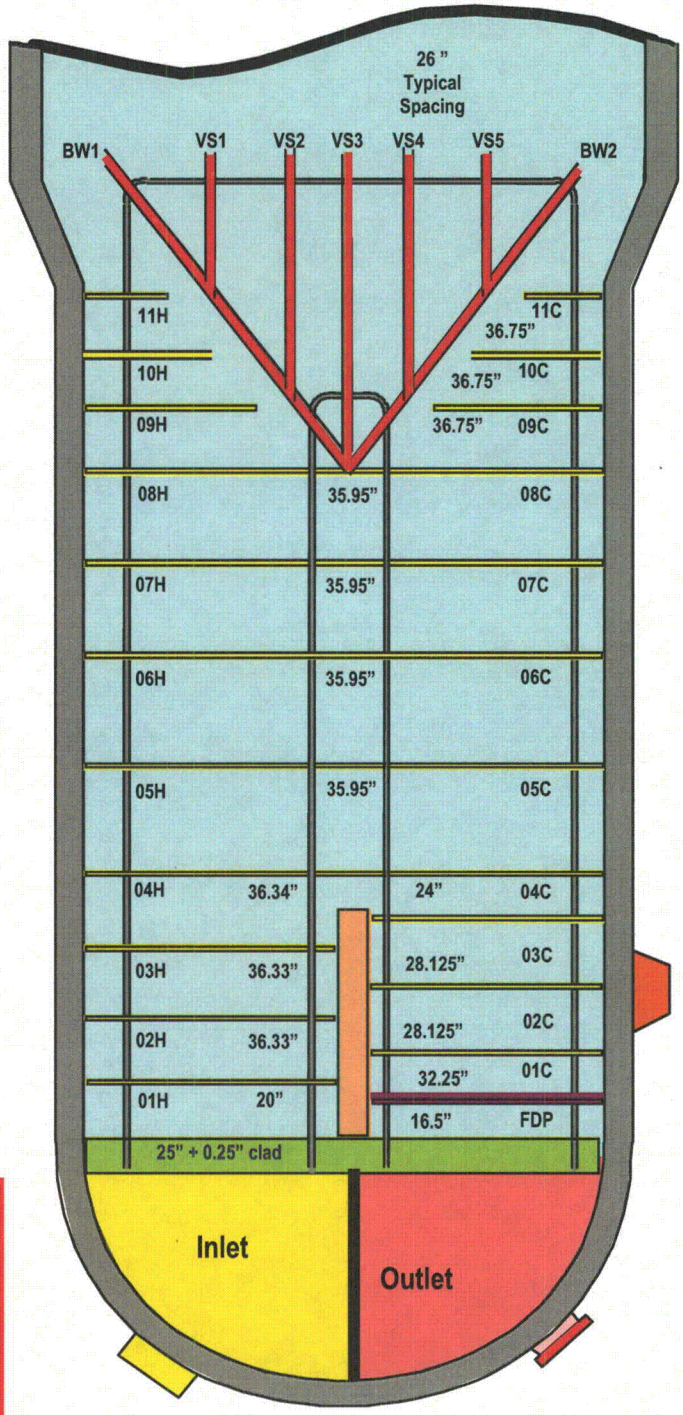
APPENDIX A

TUBE SUPPORT DIAGRAM,

LEGEND, and ANALYSIS CODES

PVNGS Steam Generator

REPLACEMENTS



Center of 08H to 08C

Row 1 - 17.415
Row 2 - 19.736
Row 3 - 22.056
Row 4 - 24.377
Row 5 - 26.698
Row 6 - 29.019

LEGEND

ROW:	Indicates the row number of a given tube.
COL:	Indicates the column number of a given tube.
VOLTS:	Indicates the peak-to-peak voltage of a given indication response.
DEG:	The measured phase angle of a given indication response.
IND:	Indicates the analysis code or PCT for percent
PER or PCT:	The percent through the tube wall of a given indication
CHN:	Indicates the channel used to make the call
LOCN:	Gives indication location at INCH1 to INCH2 relative to known landmarks such as supports, vertical straps, and batwings. Typical location codes are as follows:

#1 Vertical Strap VS1
#1 Batwing BW1
#1 Support Plate in Hot Leg 01H
#7 Support Plate in Cold Leg.....07C
Top Tube Sheet Cold Leg.....TSC
Tube End Hot Leg.....TEH
Tube End Cold Leg.....TEC

CRLEN:	Indicates the flaw length, used to identify the length of a wear indication
CRWID:	Indicates the flaw width, typically used for cracks only
CEG:	Indicates the flaw length, typically used for cracks only
BEGT and ENDT:	Indicates the beginning and of the test; together they document the examination extent
PDIA:	Documents the probe diameter
PTYPE:	Documents the probe type
CAL:	Indicates calibration number
L:	Indicates the leg the examination was conducted from
COM:	This comment field is utilized to document comments

Analysis CODES:

Absolute Drift	ADI
Bulge	BLG
Dented Buff Mark	DBM
Deposit	DEP
Dent	DNT
Data Quality Acceptance	DQA
Distorted Support Signal With Indication	DSI
Distorted Top of Tubesheet With Indication	DTI
Geometric Indication	GEO
ID Chatter	IDC
Indication Not Found	INF
Indication Not Reportable	INR
Multiple Axial Indication	MAI
Manufacturer Burnishing Mark	MBM
Mixed Mode Indication	MMI
Multiple Circumferential Indication	MCI
Multiple Volumetric Indication	MVI
No Detectable Defect	NDD
No Discontinuity Found	NDF
Non-Quantifiable Indication	NQI
No Tube Sheet Expansion	NTE
Obstructed	OBS
Over Expanded	OXP
Previous Bobbin Call	PBC
Possible Deposit	PDP
Positive Identification	PID
Positive Identification Verified	PIV
Possible Loose Part with Indication	PLI
Possible Loose Part	PLP
Previous RC Call	PRC
Possible Support Anomaly	PSA
Possible Support Indication	PSI
Permeability Variation Noise	PVN
Retest Bad Data	RBD
Retest Identification Check	RIC
Retest with Magnetic Bias RC Probe	RMB
Single Axial Indication	SAI
Single Circumferential Indication	SCI
Single Volumetric Indication	SVI
Senior (Lead) Analysis Review	SR
Sludge	SLG
To Be Plugged	TBP
Volumetric Indication	VOL

APPENDIX B

STEAM GENERATOR 11

SUMMARY DATA SHEETS

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
80	21	.24	61	PCT	9	P2	VS4	.69			VS3	TEC	.610	NBAZC	37	C
80	21	.76	86	PCT	15	P3	VS4	.94		.17	VS4	VS4	.580	NPUFZ	82	C
60	23	.21	98	PCT	7	P2	VS3	.37			VS3	TEC	.610	NBAZC	38	C
60	23	.56	85	PCT	11	P3	VS3	.37		.41	VS3	VS3	.580	NPUFZ	65	H
31	30	.22	65	PCT	8	P2	VS3	.91			VS3	TEC	.610	NBAZC	1	C
90	35	.21	101	PCT	10	P2	10H	-1.73			VS3	TEH	.610	NBAZC	45	H
90	35	.60	247	PCT	12	P3	10H	-1.73		.34	09H	VS2	.580	NPUFZ	65	H
109	36	.27	123	PCT	12	P2	VS2	-1.52			VS3	TEH	.610	NBAZC	45	H
109	36	.86	79	PCT	16	P3	VS2	-1.06		.23	VS2	VS2	.580	NPUFZ	65	H
86	37	.29	132	PCT	9	P2	VS4	-.83			VS3	TEC	.610	NBAZC	36	C
86	37	.44	116	PCT	10	P3	VS4	-1.05		.17	VS4	VS4	.580	NPUFZ	82	C
128	37	.25	112	PCT	11	P2	VS2	.56			VS3	TEH	.610	ZBAZC	29	H
128	37	.16	124	PCT	8	P2	VS3	.61			VS3	TEH	.610	ZBAZC	29	H
128	37	.99	75	PCT	17	P3	VS2	.82		.34	VS2	VS2	.580	NPUFZ	65	H
128	37	.66	92	PCT	13	P3	VS3	.96		.21	VS3	VS3	.580	NPUFZ	65	H
113	38	.16	134	PCT	7	P2	VS3	-.90			VS3	TEC	.610	NBAZC	1	C
113	38	.28	87	PCT	11	P2	VS2	-1.04			VS3	TEH	.610	ZBAZC	44	H
113	38	.72	82	PCT	14	P3	VS2	-.85		.29	VS2	VS2	.580	NPUFZ	65	H
115	38	.19	132	PCT	7	P2	VS2	-1.24			VS3	TEH	.610	ZBAZC	44	H
115	38	.53	83	PCT	10	P3	VS2	-1.00		.50	VS2	VS2	.580	NPUFZ	65	H
90	39	.13	58	PCT	7	P2	10H	-1.47			VS3	TEH	.610	NBAZC	45	H
118	39	.23	45	PCT	9	P2	BW2	-.82			VS3	TEC	.610	NBAZC	43	C
118	39	.43	76	PCT	10	P3	BW2	-.85		.14	09C	VS5	.580	NPUFZ	82	C
119	46	.36	120	PCT	12	P2	VS2	-.44			VS3	TEH	.610	ZBAZC	32	H
119	46	1.16	83	PCT	20	P3	VS2	-.50		.36	VS2	VS2	.580	NPUFZ	65	H
121	46	.59	120	PCT	17	P2	VS2	-.88			VS3	TEH	.610	ZBAZC	32	H
121	46	1.12	92	PCT	19	P3	VS2	-.90		.18	VS2	VS2	.580	NPUFZ	65	H
90	49	.22	59	PCT	8	P2	10H	-1.61			VS3	TEH	.610	ZBAZC	32	H
90	49	.53	240	PCT	10	P3	10H	-1.20		.48	09H	VS2	.580	NPUFZ	65	H
129	50	.26	116	PCT	9	P2	VS2	-.54			VS3	TEH	.610	ZBAZC	32	H
129	50	.63	84	PCT	12	P3	VS2	-.68		.49	VS2	VS2	.580	NPUFZ	65	H
130	51	.20	105	PCT	8	P2	VS3	1.00			VS3	TEH	.610	ZBAZC	33	H
130	51	.60	91	PCT	12	P3	VS3	1.00		.31	VS3	VS3	.580	NPUFZ	65	H
135	52	.26	105	PCT	10	P2	VS1	-.71			VS3	TEH	.610	ZBAZC	33	H
135	52	.69	77	PCT	13	P3	VS1	-.84		.24	VS1	VS1	.580	NPUFZ	65	H
113	54	.43	112	PCT	12	P2	VS4	1.04			VS3	TEC	.610	NBAZC	44	C
113	54	.65	73	PCT	14	P3	VS4	.91		.41	VS4	VS4	.580	NPUFZ	82	C
119	54	.35	107	PCT	10	P2	VS4	1.03			VS3	TEC	.610	NBAZC	44	C
119	54	.77	96	PCT	15	P3	VS4	1.01		.33	VS4	VS4	.580	NPUFZ	82	C
127	54	.20	144	PCT	8	P2	VS2	.42			VS3	TEH	.610	ZBAZC	28	H
127	54	.50	79	PCT	10	P3	VS2	.33		.21	VS2	VS2	.580	NPUFZ	65	H
129	54	.29	108	PCT	10	P2	VS1	-.87			VS3	TEH	.610	ZBAZC	28	H
129	54	.89	81	PCT	16	P3	VS1	-.70		.31	VS1	VS1	.580	NPUFZ	65	H
90	55	.19	75	PCT	8	P2	10H	-1.56			VS3	TEH	.610	ZBAZC	33	H
90	57	.49	132	PCT	15	P2	10H	-1.58			VS3	TEH	.610	ZBAZC	32	H
90	57	.88	108	PCT	16	P3	10H	-1.48		.33	VS3	TEH	.580	NPUFZ	64	H
137	60	.26	120	PCT	12	P2	VS1	-1.15			VS3	TEH	.610	ZBAZC	29	H
137	60	1.00	86	PCT	18	P3	VS1	-1.00		.34	VS1	VS1	.580	NPUFZ	65	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
139	62	.25	92	PCT	9	P2	VS1	-.79			VS3	TEH	.610	ZBAZC	28	H
139	62	.76	100	PCT	14	P3	VS1	-.93		.37	VS1	VS1	.580	NPUFZ	65	H
132	63	.22	126	PCT	9	P2	11H	-1.77			VS3	TEH	.610	NBAZC	25	H
111	66	.21	141	PCT	8	P2	VS3	.60			VS3	TEH	.610	ZBAZC	30	H
111	66	.67	79	PCT	13	P3	VS3	.82		.37	VS3	VS3	.580	NPUFZ	65	H
132	67	.32	90	PCT	12	P2	11H	-1.77			VS3	TEH	.610	NBAZC	25	H
90	69	.26	106	PCT	10	P2	10H	-1.41			VS3	TEH	.610	ZBAZC	30	H
130	69	.27	111	PCT	12	P2	VS1	-.79			VS3	TEH	.610	ZBAZC	27	H
130	69	.88	98	PCT	16	P3	VS1	-.67		.36	VS1	VS1	.580	NPUFZ	64	H
119	70	.43	100	PCT	15	P2	VS2	-1.03			VS3	TEH	.610	NBAZC	25	H
119	70	1.11	286	PCT	19	P3	VS2	-.69		.33	VS2	VS2	.580	NPUFZ	64	H
59	74	.25	70	PCT	9	P2	BW1	1.05			VS3	TEH	.610	ZBAZC	30	H
59	74	.72	93	PCT	13	P3	BW1	.81		.29	08H	VS2	.580	NPUFZ	63	H
90	75	.23	109	PCT	11	P2	10H	-1.46			VS3	TEH	.610	ZBAZC	31	H
90	75	.70	92	PCT	13	P3	10H	-1.19		.20	09H	VS2	.580	NPUFZ	63	H
134	75	.21	113	PCT	9	P2	VS1	-1.41			VS3	TEH	.610	NBAZC	25	H
163	76	.35	120	PCT	13	P2	BW2	-.90			VS3	TEC	.610	NBAZC	60	C
163	76	.85	104	PCT	18	P3	BW2	-.90		.21	10C	VS5	.580	NPUFZ	84	C
90	77	.29	89	PCT	11	P2	10H	-1.66			VS3	TEH	.610	ZBAZC	30	H
90	77	.72	92	PCT	13	P3	10H	-1.72		.17	09H	VS2	.580	NPUFZ	63	H
25	78	.31	56	PCT	10	P2	BW1	-1.09			VS3	TEH	.610	NBAZC	1	H
25	78	.28	51	PCT	9	P2	BW2	-1.23			VS3	TEC	.610	NBAZC	6	C
25	78	.70	113	PCT	13	P3	BW1	-.79		.14	07H	VS3	.580	NPUFZ	63	H
25	78	.63	90	PCT	13	P3	BW2	-.75		.16	07C	BW2	.580	NPUFZ	81	C
38	79	.14	344	PCT	5	P2	VS3	-1.01			VS3	TEC	.610	NBAZC	1	C
40	79	.31	104	PCT	13	P2	VS3	.62			VS3	TEH	.610	NBAZC	2	H
40	79	.59	92	PCT	11	P3	VS3	.67		.16	VS3	VS3	.580	NPUFZ	63	H
90	79	.19	78	PCT	9	P2	10H	-1.37			VS3	TEH	.610	ZBAZC	31	H
90	79	.53	81	PCT	10	P3	10H	-1.59		.20	09H	VS2	.580	NPUFZ	63	H
132	79	.18	38	PCT	8	P2	11H	-1.45			VS3	TEH	.610	NBAZC	25	H
132	79	.42	106	INR	8	P3	11H	-1.62			10H	VS1	.580	NPUFZ	62	H
31	80	.37	125	PCT	15	P2	BW1	-.80			VS3	TEH	.610	NBAZC	2	H
31	80	.75	90	PCT	14	P3	BW1	-.84		.14	07H	VS3	.580	NPUFZ	63	H
167	80	.38	91	PCT	10	P2	BW2	-.88			VS3	TEC	.610	NBAZC	61	C
167	80	.87	103	PCT	18	P3	BW2	-.88		.36	10C	VS5	.580	NPUFZ	84	C
60	81	.48	118	PCT	15	P2	BW1	.99			VS3	TEH	.610	ZBAZC	30	H
60	81	1.31	91	PCT	21	P3	BW1	1.21		.29	08H	VS2	.580	NPUFZ	63	H
136	81	.18	142	PCT	9	P2	VS2	.49			VS3	TEH	.610	ZBAZC	27	H
136	81	.69	90	PCT	13	P3	VS2	.87		.44	VS2	VS2	.580	NPUFZ	62	H
164	81	.22	49	PCT	10	P2	BW1	.57			VS3	TEH	.610	ZBAZC	27	H
164	81	.71	106	PCT	13	P3	BW1	.48		.39	10H	VS1	.580	NPUFZ	62	H
35	82	.33	107	PCT	11	P2	BW1	-.83			VS3	TEH	.610	NBAZC	1	H
35	82	.55	93	PCT	10	P3	BW1	-.88		.17	07H	VS3	.580	NPUFZ	63	H
47	82	.20	127	PCT	9	P2	BW1	.95			VS3	TEH	.610	NBAZC	2	H
44	83	.19	137	PCT	9	P2	BW1	-.98			VS3	TEH	.610	NBAZC	2	H
44	83	.33	123	PCT	13	P2	BW1	.92			VS3	TEH	.610	NBAZC	2	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
44	83	.68	93	PCT	12	P3	BW1	1.11		.27	07H	VS3	.580	NPUFZ	63	H
48	83	.41	131	PCT	16	P2	BW1	1.03			VS3	TEH	.610	NBAZC	2	H
48	83	.19	87	PCT	9	P2	VS3	-.82			VS3	TEH	.610	NBAZC	2	H
48	83	.57	113	PCT	11	P3	BW1	.76		.34	08H	VS3	.580	NPUFZ	63	H
48	83	.56	82	PCT	11	P3	VS3	-.73		.22	08H	VS3	.580	NPUFZ	63	H
90	83	.18	109	PCT	9	P2	10H	-1.07			VS3	TEH	.610	ZBAZC	31	H
90	83	.60	71	PCT	11	P3	10H	-1.32		.17	09H	VS2	.580	NPUFZ	63	H
166	83	.25	67	PCT	10	P2	BW1	.94			VS3	TEH	.610	NBAZC	25	H
166	83	.56	117	PCT	11	P3	BW1	1.15		.23	10H	VS1	.580	NPUFZ	62	H
47	84	.69	104	PCT	19	P2	BW1	.69			VS3	TEH	.610	NBAZC	1	H
47	84	1.32	99	PCT	21	P3	BW1	.78		.31	07H	VS3	.580	NPUFZ	62	H
132	85	.15	60	PCT	6	P2	11C	-1.52			VS3	TEC	.610	NBAZC	1	C
39	86	.48	128	PCT	15	P2	VS3	-1.02			VS3	TEC	.610	NBAZC	1	C
39	86	1.16	87	PCT	19	P3	VS3	-1.07		.41	VS3	VS3	.580	NPUFZ	63	H
43	86	.32	144	PCT	13	P2	BW1	.90			VS3	TEH	.610	NBAZC	2	H
43	86	.65	82	PCT	12	P3	BW1	1.00		.22	07H	VS3	.580	NPUFZ	63	H
45	86	.27	146	PCT	12	P2	BW1	.88			VS3	TEH	.610	NBAZC	2	H
45	86	.43	105	INR	8	P3	BW1	.87			07H	VS3	.580	NPUFZ	62	H
46	87	.27	132	PCT	12	P2	BW1	.87			VS3	TEH	.610	NBAZC	2	H
46	87	.81	90	PCT	15	P3	BW1	.82		.25	07H	VS3	.580	NPUFZ	63	H
48	87	.29	119	PCT	11	P2	09C	-1.47			VS3	TEC	.610	NBAZC	1	C
48	87	.44	117	PCT	10	P3	09C	-1.47		.23	08C	BW2	.580	NPUFZ	81	C
43	88	.16	114	PCT	6	P2	BW1	.86			VS3	TEH	.610	NBAZC	1	H
43	88	.21	145	PCT	9	P2	BW2	-.75			VS3	TEC	.610	NBAZC	5	C
45	88	.26	123	PCT	11	P2	BW1	.82			VS3	TEH	.610	NBAZC	2	H
45	88	.66	85	PCT	12	P3	BW1	.77		.27	07H	VS3	.580	NPUFZ	63	H
44	89	.22	141	PCT	8	P2	BW1	-.77			VS3	TEH	.610	NBAZC	1	H
46	89	.16	67	PCT	8	P2	BW1	-.96			VS3	TEH	.610	NBAZC	2	H
43	90	.18	49	PCT	7	P2	BW1	-.76			VS3	TEH	.610	NBAZC	1	H
167	90	.28	93	PCT	11	P2	BW2	-.97			VS3	TEC	.610	NBAZC	62	C
167	90	.72	105	PCT	16	P3	BW2	-.97		.42	10C	VS5	.580	NPUFZ	84	C
48	91	.25	87	PCT	9	P2	09C	-1.34			VS3	TEC	.610	NBAZC	1	C
82	91	.25	67	PCT	9	P2	VS3	.65			VS3	TEC	.610	NBAZC	1	C
82	91	.72	87	PCT	13	P3	VS3	.75		.25	VS3	VS3	.580	NPUFZ	62	H
136	91	.21	74	PCT	10	P2	VS1	-.10			VS3	TEH	.610	ZBAZC	22	H
136	91	.56	91	PCT	11	P3	VS1	-.37		.25	VS1	VS1	.580	NPUFZ	62	H
132	93	.32	138	PCT	12	P2	11C	-1.93			VS3	TEC	.610	NBAZC	62	C
132	93	.55	98	PCT	13	P3	11C	-1.93		.36	10C	VS5	.580	NPUFZ	84	C
48	95	.28	128	PCT	9	P2	BW2	.76			VS3	TEC	.610	NBAZC	8	C
48	95	.76	112	PCT	15	P3	BW2	.85		.34	08C	BW2	.580	NPUFZ	81	C
127	96	.21	56	PCT	8	P2	VS1	.78			VS3	TEH	.610	NBAZC	21	H
51	98	.15	84	PCT	6	P2	BW2	-.79			VS3	TEC	.610	NBAZC	9	C
143	98	.26	131	PCT	12	P2	VS1	.76			VS3	TEH	.610	ZBAZC	22	H
143	98	.90	83	PCT	16	P3	VS1	.72		.27	VS1	VS1	.580	NPUFZ	62	H
48	99	1.11	112	PCT	25	P2	BW2	1.30			VS3	TEC	.610	NBAZC	8	C
48	99	1.97	88	PCT	29	P3	BW2	.87		.58	08C	VS3	.580	NPUFZ	82	C
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
56	99	.39	67	PCT	15	P2	VS3	-1.05			VS3	TEH	.610	ZBAZC	24	H
56	99	.56	119	PCT	11	P3	VS3	-1.18		.26	VS3	VS3	.580	NPUFZ	62	H
56	99	1.18	101	PCT	20	P3	VS3	-.80		.26	VS3	VS3	.580	NPUFZ	62	H
68	99	1.63	95	PCT	31	P2	VS3	-.82			VS3	TEC	.610	NBAZC	1	C
68	99	2.58	94	PCT	34	P3	VS3	-.84		.56	VS3	VS3	.580	NPUFZ	62	H
171	100	.49	104	PCT	16	P2	02C	-.07			VS3	TEC	.610	NBAZC	1	C
171	100	1.35	102	PCT	22	P3	02C	.08		.61	02C	02C	.600	ZPAHZ	80	C
48	101	.16	84	PCT	8	P2	BW1	.80			VS3	TEH	.610	NBAZC	3	H
48	101	.26	137	PCT	10	P2	VS3	.83			VS3	TEH	.610	NBAZC	3	H
48	101	.23	111	PCT	8	P2	09C	-1.27			VS3	TEC	.610	NBAZC	10	C
48	101	.58	95	PCT	11	P3	VS3	.76		.26	08H	VS3	.580	NPUFZ	62	H
146	101	.18	125	PCT	7	P2	VS2	-.63			VS3	TEH	.610	NBAZC	21	H
146	101	.36	109	INR	7	P3	VS2	-1.10			VS2	VS2	.580	NPUFZ	62	H
168	101	.49	64	PCT	16	P2	01C	-.93			VS3	TEC	.610	NBAZC	64	C
168	101	1.06	101	PCT	19	P3	01C	-1.07		.47	01C	01C	.600	ZPAHZ	80	C
48	103	.61	101	PCT	18	P2	VS3	-.76			VS3	TEC	.610	NBAZC	1	C
48	103	.27	80	PCT	10	P2	VS3	.90			VS3	TEC	.610	NBAZC	1	C
48	103	.89	109	PCT	22	P2	09C	-1.74			VS3	TEC	.610	NBAZC	1	C
48	103	.36	113	PCT	12	P2	BW1	-.89			VS3	TEH	.610	NBAZC	3	H
48	103	.46	83	INR	9	P3	BW1	-1.17			08H	VS3	.580	NPUFZ	62	H
48	103	.98	109	PCT	17	P3	VS3	-.66		.46	08H	VS3	.580	NPUFZ	62	H
48	103	.60	82	PCT	11	P3	VS3	.96		.13	08H	VS3	.580	NPUFZ	62	H
48	103	.94	105	PCT	18	P3	09C	-1.73		.26	08C	BW2	.580	NPUFZ	82	C
150	103	.15	120	PCT	8	P2	10H	-.20			VS3	TEH	.610	ZBAZC	22	H
48	105	.77	104	PCT	21	P2	VS3	.65			VS3	TEC	.610	NBAZC	1	C
48	105	.21	142	PCT	8	P2	BW2	.31			VS3	TEC	.610	NBAZC	1	C
48	105	.52	126	PCT	16	P2	BW2	.73			VS3	TEC	.610	NBAZC	1	C
48	105	.41	111	PCT	14	P2	09C	-1.80			VS3	TEC	.610	NBAZC	1	C
48	105	1.42	105	PCT	32	P2	BW1	-1.18			VS3	TEH	.610	NBAZC	4	H
48	105	1.26	113	PCT	21	P3	BW1	-1.22		.45	08H	VS3	.580	NPUFZ	62	H
48	105	.72	97	PCT	13	P3	VS3	.57		.38	08H	VS3	.580	NPUFZ	62	H
48	105	.96	96	PCT	17	P3	VS3	.68		.83	08H	VS3	.580	NPUFZ	62	H
48	105	.93	99	PCT	17	P3	BW2	.52		.26	08C	VS3	.580	NPUFZ	82	C
48	105	.60	92	PCT	13	P3	09C	-1.65		.36	08C	BW2	.580	NPUFZ	82	C
47	106	.23	122	PCT	9	P2	VS3	-.03			VS3	TEC	.610	NBAZC	1	C
47	106	1.05	109	PCT	25	P2	BW2	-.63			VS3	TEC	.610	NBAZC	1	C
47	106	.21	125	PCT	8	P2	BW2	-.22			VS3	TEC	.610	NBAZC	1	C
47	106	.22	150	PCT	8	P2	BW1	-.83			VS3	TEH	.610	NBAZC	3	H
47	106	.36	117	PCT	12	P2	BW1	.57			VS3	TEH	.610	NBAZC	3	H
47	106	.79	106	PCT	14	P3	BW1	.76		.29	07H	VS3	.580	NPUFZ	61	H
47	106	.85	93	PCT	15	P3	VS3	.03		.44	07H	VS3	.580	NPUFZ	61	H
47	106	1.01	97	PCT	19	P3	BW2	-1.03		.41	07C	BW2	.580	NPUFZ	82	C
48	107	.26	84	PCT	10	P2	BW1	-.89			VS3	TEH	.610	NBAZC	3	H
48	107	.16	70	PCT	6	P2	VS3	-.72			VS3	TEH	.610	NBAZC	3	H
48	107	.15	111	PCT	6	P2	VS3	.13			VS3	TEH	.610	NBAZC	3	H
48	107	.39	101	PCT	13	P2	09C	-1.41			VS3	TEC	.610	NBAZC	9	C
48	107	.58	103	PCT	11	P3	BW1	-.90		.26	08H	VS3	.580	NPUFZ	61	H
48	107	.52	88	PCT	11	P3	09C	-1.58		.23	08C	BW2	.580	NPUFZ	82	C
50	107	.16	102	PCT	7	P2	BW1	.55			VS3	TEH	.610	NBAZC	3	H
96	107	.54	101	PCT	17	P2	VS4	-.45			VS3	TEC	.610	NBAZC	54	C
96	107	.93	90	PCT	18	P3	VS4	-.91		.38	VS4	VS4	.580	NPUFZ	82	C
51	108	.22	121	INR	9	P2	VS3	.59			VS3	TEC	.610	NBAZC	1	C
48	109	.55	101	PCT	17	P2	VS3	.76			VS3	TEC	.610	NBAZC	1	C
48	109	.62	105	PCT	18	P2	09C	-1.49			VS3	TEC	.610	NBAZC	1	C
48	109	.57	96	PCT	20	P2	BW1	-1.10			VS3	TEH	.610	NBAZC	4	H
48	109	.64	60	PCT	12	P3	BW1	-.98		.19	08H	VS3	.580	NPUFZ	61	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
48	109	.83	100	PCT	15	P3	VS3	78		.44	08H	VS3	.580	NPUFZ	61	H
48	109	.72	96	PCT	15	P3	09C	-1 62		.21	08C	BW2	.580	NPUFZ	82	C
47	110	.21	61	PCT	8	P2	BW2	70			VS3	TEC	.610	NBAZC	1	C
47	110	.97	122	PCT	24	P2	BW1	- 87			VS3	TEH	.610	NBAZC	3	H
47	110	1.51	107	PCT	24	P3	BW1	- 76		.29	07H	VS3	.580	NPUFZ	61	H
47	110	.49	105	PCT	11	P3	BW2	98		.16	07C	BW2	.580	NPUFZ	82	C
48	111	.30	95	PCT	11	P2	VS3	76			VS3	TEC	.610	NBAZC	1	C
48	111	.42	116	PCT	14	P2	09C	-1 37			VS3	TEC	.610	NBAZC	1	C
48	111	.75	84	PCT	16	P3	VS3	76		.38	VS3	VS3	.580	NPUFZ	84	C
97	112	.13	116	PCT	6	P2	BW1	- 53			VS3	TEH	.610	NBAZC	17	H
165	112	.23	74	PCT	9	P2	BW1	- 68			VS3	TEH	.610	NBAZC	21	H
165	112	.52	114	PCT	10	P3	BW1	-1 07		.24	10H	VS1	.580	NPUFZ	62	H
48	113	.32	106	PCT	11	P2	09C	-1 51			VS3	TEC	.610	NBAZC	1	C
48	113	.48	86	PCT	10	P3	09C	-1 69		.21	08C	BW2	.580	NPUFZ	82	C
132	113	.16	127	PCT	6	P2	11H	-1 65			VS3	TEH	.610	NBAZC	19	H
132	115	.15	33	PCT	7	P2	11H	-1 54			VS3	TEH	.610	ZBAZC	20	H
59	116	1.66	103	PCT	31	P2	VS3	83			VS3	TEC	.610	NBAZC	1	C
59	116	1.79	80	PCT	26	P3	VS3	97		.27	VS3	VS3	.580	NPUFZ	60	H
46	117	.22	147	PCT	10	P2	VS3	58			VS3	TEH	.610	NBAZC	4	H
46	117	.79	82	PCT	14	P3	VS3	1 08		.65	VS3	VS3	.580	NPUFZ	60	H
48	117	.26	90	PCT	10	P2	09C	-1 48			VS3	TEC	.610	NBAZC	1	C
48	117	.47	97	PCT	10	P3	09C	-1 61		.23	08C	BW2	.580	NPUFZ	82	C
90	117	.19	102	PCT	9	P2	10H	-1 62			VS3	TEH	.610	NBAZC	16	H
90	117	.51	84	INR	9	P3	10H	-1 69			09H	VS2	.580	NPUFZ	60	H
140	117	.14	141	PCT	5	P2	VS1	1 13			VS3	TEH	.610	NBAZC	19	H
38	119	.43	128	PCT	14	P2	BW1	-1 12			VS3	TEH	.610	NBAZC	3	H
38	119	.52	126	PCT	10	P3	BW1	- 82		.17	07H	VS3	.580	NPUFZ	61	H
48	119	.22	103	PCT	9	P2	09C	-1 57			VS3	TEC	.610	NBAZC	9	C
90	119	.18	107	PCT	7	P2	10H	-1 58			VS3	TEH	.610	NBAZC	15	H
37	120	1.18	125	PCT	29	P2	BW1	-1 05			VS3	TEH	.610	NBAZC	4	H
37	120	1.81	109	PCT	27	P3	BW1	- 38		.26	07H	VS3	.580	NPUFZ	61	H
39	120	.53	120	PCT	16	P2	BW2	- 76			VS3	TEC	.610	NBAZC	1	C
39	120	.57	118	PCT	12	P3	BW2	- 84		.29	07C	BW2	.580	NPUFZ	82	C
41	120	.23	131	PCT	8	P2	BW2	-1 10			VS3	TEC	.610	NBAZC	10	C
151	120	.22	73	PCT	8	P2	VS1	- 91			VS3	TEH	.610	NBAZC	19	H
151	120	.56	99	PCT	11	P3	VS1	- 79		.50	VS1	VS1	.580	NPUFZ	60	H
38	121	.35	126	PCT	14	P2	VS3	58			VS3	TEH	.610	NBAZC	4	H
38	121	.77	95	PCT	14	P3	VS3	28		.28	VS3	VS3	.580	NPUFZ	61	H
40	121	.29	112	PCT	11	P2	BW2	- 69			VS3	TEC	.610	NBAZC	1	C
40	121	.43	123	PCT	10	P3	BW2	- 85		.13	07C	BW2	.580	NPUFZ	82	C
35	122	.31	105	PCT	11	P2	BW1	- 90			VS3	TEH	.610	NBAZC	3	H
35	122	.59	85	PCT	11	P3	BW1	- 74		.11	07H	VS3	.580	NPUFZ	61	H
37	122	.15	118	PCT	6	P2	BW2	-1 00			VS3	TEC	.610	NBAZC	9	C
34	123	.41	103	PCT	14	P2	BW2	- 63			VS3	TEC	.610	NBAZC	1	C
34	123	.69	95	PCT	14	P3	BW2	- 87		.15	07C	BW2	.580	NPUFZ	82	C
36	123	.20	48	PCT	8	P2	BW1	1 28			VS3	TEH	.610	NBAZC	3	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
48	123	.24	77	PCT	9	P2	09C	-1.34			VS3	TEC	.610	NBAZC	1	C
35	124	.34	123	PCT	14	P2	BW1	-1.05			VS3	TEH	.610	NBAZC	4	H
35	124	.73	123	PCT	13	P3	BW1	-.77		.19	07H	VS3	.580	NPUFZ	61	H
163	124	.38	109	PCT	13	P2	BW2	-.77			VS3	TEC	.610	NBAZC	66	C
163	124	.64	106	PCT	14	P3	BW2	-.77		.47	10C	VS5	.580	NPUFZ	84	C
165	124	.51	98	PCT	16	P2	BW2	-.85			VS3	TEC	.610	NBAZC	66	C
165	124	1.06	94	PCT	20	P3	BW2	-.84		.27	10C	VS5	.580	NPUFZ	84	C
28	125	.16	116	PCT	8	P2	BW1	1.45			VS3	TEH	.610	NBAZC	4	H
165	126	.47	89	PCT	14	P2	BW2	-1.14			VS3	TEC	.610	NBAZC	67	C
165	126	.92	103	PCT	19	P3	BW2	-1.14		.38	10C	VS5	.580	NPUFZ	84	C
124	127	.23	49	PCT	9	P2	BW2	-.95			VS3	TEC	.610	NBAZC	1	C
165	128	.21	137	PCT	8	P2	BW1	-1.04			VS3	TEH	.610	NBAZC	17	H
165	128	.57	98	PCT	10	P3	BW1	-1.05		.27	10H	VS1	.580	NPUFZ	60	H
165	128	.27	99	PCT	10	P2	BW2	-.90			VS3	TEC	.610	NBAZC	66	C
165	128	.56	91	PCT	13	P3	BW2	-.90		.38	10C	VS5	.580	NPUFZ	84	C
90	129	.18	41	PCT	9	P2	10H	-1.61			VS3	TEH	.610	NBAZC	16	H
90	129	.58	103	PCT	10	P3	10H	-1.49		.17	09H	VS2	.580	NPUFZ	60	H
132	129	.21	85	PCT	8	P2	VS1	-.29			VS3	TEH	.610	NBAZC	19	H
90	131	.13	88	PCT	4	P2	09H	-.76			VS3	TEH	.610	NBAZC	15	H
164	131	.28	70	PCT	11	P2	BW2	.85			VS3	TEC	.610	NBAZC	66	C
164	131	.44	117	PCT	11	P3	BW2	.85		.18	10C	VS5	.580	NPUFZ	84	C
126	133	.18	100	PCT	7	P2	VS2	1.59			VS3	TEH	.610	NBAZC	19	H
136	133	.13	123	PCT	5	P2	VS1	.73			VS3	TEH	.610	NBAZC	19	H
90	135	.23	65	PCT	9	P2	10H	-1.52			VS3	TEH	.610	NBAZC	15	H
104	135	.29	107	PCT	11	P2	VS2	.81			VS3	TEH	.610	NBAZC	15	H
104	135	.91	86	PCT	15	P3	VS2	1.08		.42	VS2	VS2	.580	NPUFZ	60	H
12	137	.20	117	PCT	7	P2	05H	.43			VS3	TEH	.610	ZBAZC	40	H
12	137	.52	94	PCT	10	P3	05H	.08		.40	05H	05H	.600	ZPAHZ	58	H
90	137	.23	120	PCT	10	P2	10H	-1.74			VS3	TEH	.610	NBAZC	12	H
90	137	.59	98	PCT	11	P3	10H	-1.90		.11	09H	VS2	.580	NPUFZ	60	H
130	137	.19	107	PCT	8	P2	VS1	1.05			VS3	TEH	.610	NBAZC	17	H
158	141	.34	116	PCT	10	P2	BW2	-.80			VS3	TEC	.610	NBAZC	57	C
158	141	.55	105	PCT	13	P3	BW2	-.80		.24	10C	VS5	.580	NPUFZ	84	C
141	144	.21	125	PCT	8	P2	VS3	-.86			VS3	TEC	.610	NBAZC	1	C
141	144	.66	87	PCT	12	P3	VS3	-.82		.29	VS3	VS3	.580	NPUFZ	60	H
115	148	.30	112	PCT	11	P2	VS3	-.86			VS3	TEC	.610	NBAZC	1	C
115	148	.76	91	PCT	13	P3	VS3	-.76		.47	VS3	VS3	.580	NPUFZ	60	H
58	149	.29	142	PCT	11	P2	BW1	.56			VS3	TEH	.610	NBAZC	5	H
58	149	.85	97	PCT	15	P3	BW1	.04		.37	08H	VS3	.580	NPUFZ	61	H
101	150	.28	101	PCT	8	P2	VS3	-.61			VS3	TEC	.610	NBAZC	24	C
109	150	.21	120	PCT	7	P2	VS3	-.60			VS3	TEC	.610	NBAZC	24	C
70	151	.20	130	PCT	8	P2	VS2	.77			VS3	TEH	.610	NBAZC	11	H
102	151	.28	137	PCT	10	P2	VS2	.61			VS3	TEH	.610	NBAZC	11	H

| ROW | COL | VOLTS | DEG | IND | PER | CHN | LOCN | INCH1 | INCH2 | CRLEN | BEGT | ENDT | PDIA | PTYPE | CAL | L |

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
132	153	.39	127	PCT	13	P2	11H	-1.55			VS3	TEH	.610	NBAZC	13	H
132	153	.84	77	PCT	14	P3	11H	-1.82		.28	10H	VS1	.580	NPUFZ	60	H
90	155	.23	83	PCT	9	P2	10H	-1.58			VS3	TEH	.610	NBAZC	11	H
90	155	.56	86	PCT	10	P3	10H	-1.40		.19	09H	VS2	.580	NPUFZ	60	H
109	158	.21	32	PCT	7	P2	VS4	-.62			VS3	TEC	.610	NBAZC	24	C
109	158	.66	104	PCT	14	P3	VS4	-.62		.29	VS4	VS4	.580	NPUFZ	84	C
106	161	.24	143	PCT	8	P2	BW2	-1.42			VS3	TEC	.610	NBAZC	24	C
106	161	.44	101	PCT	11	P3	BW2	-1.42		.32	09C	VS4	.580	NPUFZ	84	C
108	161	.23	103	PCT	7	P2	BW2	-1.87			VS3	TEC	.610	NBAZC	24	C
108	161	.45	101	PCT	10	P3	BW2	-1.80		.42	09C	VS4	.580	NPUFZ	82	C
115	164	.19	56	PCT	8	P2	BW2	.58			VS3	TEC	.610	NBAZC	25	C
132	165	.64	113	PCT	19	P2	11H	1.05			VS3	TEH	.610	NBAZC	13	H
132	165	1.23	84	PCT	21	P3	11H	1.00		.41	10H	VS1	.580	NPUFZ	65	H
134	165	.19	62	PCT	8	P2	VS3	.59			VS3	TEC	.610	NBAZC	23	C
134	165	.53	91	PCT	10	P3	VS3	.92		.22	VS3	VS3	.580	NPUFZ	61	H
106	177	.21	34	PCT	7	P2	BW2	-1.02			VS3	TEC	.610	NBAZC	22	C
112	177	.19	39	PCT	6	P2	BW2	-.89			VS3	TEC	.610	NBAZC	22	C
104	179	.15	92	PCT	7	P2	BW2	-.95			VS3	TEC	.610	NBAZC	21	C
87	180	.51	117	PCT	16	P2	BW1	1.00			VS3	TEH	.610	NBAZC	9	H
87	180	.85	265	PCT	15	P3	BW1	1.07		.05	08H	VS2	.580	NPUFZ	59	H
83	184	.21	78	PCT	9	P2	BW1	1.22			VS3	TEH	.610	NBAZC	7	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

APPENDIX C

STEAM GENERATOR 12

SUMMARY DATA SHEETS

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
51	22	.31	23	PCT	10	P2	VS3	1.21			VS3	TEC	.610	NBAZC	9	C
51	32	.20	118	PCT	6	P2	VS3	1.13			VS3	TEC	.610	NBAZC	7	C
124	33	.26	33	PCT	12	P2	10H	-.23			VS3	TEH	.610	ZBAZC	60	H
124	33	.69	93	PCT	11	P3	10H	-.16		.43	09H	VS1	.580	NPUFZ	73	H
125	38	.22	110	PCT	10	P2	VS2	.85			VS3	TEH	.610	ZBAZC	64	H
119	40	.44	130	PCT	13	P2	VS2	-.82			VS3	TEH	.610	NBAZC	65	H
119	40	1.16	86	PCT	17	P3	VS2	-.87		.41	VS2	VS2	.580	NPUFZ	73	H
32	43	.28	148	PCT	8	P2	VS3	-.72			VS3	TEC	.610	NBAZC	8	C
124	45	.32	127	PCT	10	P2	VS2	.93			VS3	TEH	.610	NBAZC	65	H
124	45	.83	89	PCT	13	P3	VS2	.83		.27	VS2	VS2	.580	NPUFZ	73	H
130	49	.55	140	PCT	16	P2	VS1	-.73			VS3	TEH	.610	NBAZC	40	H
130	49	.61	94	PCT	17	P2	VS3	-.61			VS3	TEH	.610	NBAZC	40	H
130	49	.92	97	PCT	15	P3	VS1	-.68		.30	VS1	VS1	.580	NPUFZ	73	H
130	49	1.27	93	PCT	19	P3	VS3	-.68		.44	VS3	VS3	.580	NPUFZ	73	H
137	50	.25	58	PCT	10	P2	VS1	-1.00			VS3	TEH	.610	ZBAZC	39	H
137	50	.71	91	PCT	12	P3	VS1	-.65		.24	VS1	VS1	.580	NPUFZ	73	H
128	53	.53	144	PCT	16	P2	VS1	-.56			VS3	TEH	.610	NBAZC	40	H
128	53	.44	98	PCT	14	P2	VS3	.51			VS3	TEH	.610	NBAZC	40	H
128	53	1.13	93	PCT	17	P3	VS1	-.71		.46	VS1	VS1	.580	NPUFZ	73	H
115	54	.46	59	PCT	14	P2	VS2	-1.17			VS3	TEH	.610	ZBAZC	62	H
115	54	1.21	92	PCT	18	P3	VS2	-.88		.92	VS2	VS2	.580	NPUFZ	73	H
145	54	.19	43	PCT	9	P2	VS2	.25			VS3	TEH	.610	ZBAZC	37	H
145	54	.60	103	PCT	10	P3	VS2	.38		.38	VS2	VS2	.580	NPUFZ	73	H
114	55	.31	61	PCT	11	P2	VS2	-1.00			VS3	TEH	.610	ZBAZC	62	H
114	55	.80	87	PCT	13	P3	VS2	-.64		.24	VS2	VS2	.580	NPUFZ	73	H
116	55	.32	65	PCT	11	P2	VS2	-1.04			VS3	TEH	.610	ZBAZC	62	H
116	55	.65	85	PCT	11	P3	VS2	-.85		.14	VS2	VS2	.580	NPUFZ	73	H
118	57	.35	102	PCT	12	P2	VS2	1.22			VS3	TEH	.610	NBAZC	63	H
118	57	.76	91	PCT	12	P3	VS2	1.01		.16	VS2	VS2	.580	NPUFZ	73	H
128	59	.14	38	PCT	6	P2	VS2	.41			VS3	TEH	.610	ZBAZC	37	H
125	60	.22	66	PCT	7	P2	VS4	.76			VS3	TEC	.610	NBAZC	43	C
135	60	.30	127	PCT	10	P2	VS3	-1.00			VS3	TEH	.610	ZBAZC	38	H
141	60	.17	72	PCT	6	P2	VS2	.91			VS3	TEH	.610	ZBAZC	38	H
48	61	.73	107	PCT	17	P2	09C	-1.79			VS3	TEC	.610	NBAZC	5	C
48	61	1.11	88	PCT	17	P3	09C	-1.44		.53	08C	VS3	.580	NPUFZ	70	C
147	62	.34	91	PCT	13	P2	VS2	.84			VS3	TEH	.610	ZBAZC	37	H
147	62	.63	93	PCT	20	P2	VS3	-.64			VS3	TEH	.610	ZBAZC	37	H
147	62	.99	89	PCT	15	P3	VS2	.76		.33	VS2	VS2	.580	NPUFZ	73	H
147	62	1.16	85	PCT	17	P3	VS3	-.91		.32	VS3	VS3	.580	NPUFZ	73	H
120	63	.23	68	PCT	10	P2	VS2	-.90			VS3	TEH	.610	ZBAZC	37	H
120	63	.68	82	PCT	11	P3	VS2	-.82		.43	VS2	VS2	.580	NPUFZ	73	H
150	63	.54	89	PCT	18	P2	VS1	.91			VS3	TEH	.610	ZBAZC	35	H
150	63	1.57	90	PCT	22	P3	VS1	.72		.43	VS1	VS1	.580	NPUFZ	73	H
136	65	.23	118	PCT	8	P2	VS3	.81			VS3	TEH	.610	ZBAZC	36	H
136	65	.58	88	PCT	10	P3	VS3	.87		.30	VS3	VS3	.580	NPUFZ	73	H
47	66	.36	145	PCT	11	P2	VS3	-.59			VS3	TEH	.610	NBAZC	2	H
47	66	.71	80	PCT	12	P3	VS3	-.43		.15	VS3	VS3	.580	NPUFZ	71	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
120	67	.20	83	PCT	9	P2	VS2	-.76			VS3	TEH	.610	ZBAZC	35	H
120	67	.65	77	PCT	11	P3	VS2	-.70		.40	VS2	VS2	.580	NPUFZ	71	H
77	68	.15	56	INR	6	P2	VS2	.68			VS3	TEH	.610	ZBAZC	62	H
147	68	.22	68	PCT	8	P2	VS3	-.79			VS3	TEH	.610	ZBAZC	36	H
118	69	.29	96	PCT	10	P2	VS3	.46			VS3	TEH	.610	ZBAZC	36	H
118	69	.85	87	PCT	14	P3	VS3	.91		.32	VS3	VS3	.580	NPUFZ	71	H
140	71	.87	94	PCT	24	P2	VS2	-.99			VS3	TEH	.610	ZBAZC	35	H
140	71	1.64	89	PCT	23	P3	VS2	-.92		.32	VS2	VS2	.580	NPUFZ	73	H
154	71	.23	41	PCT	10	P2	VS3	.77			VS3	TEH	.610	ZBAZC	35	H
154	71	.58	84	PCT	10	P3	VS3	.96		.42	VS3	VS3	.580	NPUFZ	73	H
119	74	.26	50	PCT	11	P2	VS3	-.70			VS3	TEH	.610	ZBAZC	39	H
156	75	.40	79	PCT	15	P2	VS1	.84			VS3	TEH	.610	ZBAZC	35	H
156	75	1.05	87	PCT	16	P3	VS1	.96		.17	VS1	VS1	.580	NPUFZ	71	H
137	76	.40	131	PCT	13	P2	VS3	-.98			VS3	TEH	.610	ZBAZC	28	H
137	76	.61	73	PCT	10	P3	VS3	-.88		.18	VS3	VS3	.580	NPUFZ	71	H
47	78	.36	139	PCT	12	P2	BW1	.83			VS3	TEH	.610	NBAZC	4	H
58	81	.31	43	PCT	12	P2	BW1	.95			VS3	TEH	.610	NBAZC	25	H
58	81	.78	95	PCT	13	P3	BW1	.70		.28	08H	VS3	.580	NPUFZ	71	H
47	82	.68	99	PCT	18	P2	BW1	-1.07			VS3	TEH	.610	NBAZC	4	H
47	82	.92	86	PCT	14	P3	BW1	-.96		.20	07H	VS3	.580	NPUFZ	71	H
56	83	.28	37	PCT	10	P2	VS3	-.57			VS3	TEH	.610	NBAZC	24	H
116	85	.15	93	PCT	7	P2	BW1	-.82			VS3	TEH	.610	NBAZC	23	H
132	85	.10	131	PCT	5	P2	11H	-.18			VS3	TEH	.610	NBAZC	23	H
47	86	.36	110	PCT	10	P2	BW2	1.12			VS3	TEC	.610	NBAZC	2	C
47	86	.86	101	PCT	15	P3	BW2	1.11		.31	07C	VS3	.580	NPUFZ	71	C
57	86	.22	73	PCT	8	P2	VS3	.98			VS3	TEH	.610	NBAZC	24	H
57	88	.52	101	PCT	15	P2	VS3	-1.04			VS3	TEC	.610	NBAZC	18	C
57	88	1.01	83	PCT	16	P3	VS3	-.86		.17	VS3	VS3	.580	NPUFZ	71	H
125	88	.45	107	PCT	16	P2	VS1	.72			VS3	TEH	.610	NBAZC	23	H
125	88	1.41	86	PCT	20	P3	VS1	1.07		.80	VS1	VS1	.580	NPUFZ	71	H
48	89	.24	72	PCT	10	P2	VS3	-1.20			VS3	TEH	.610	NBAZC	3	H
45	90	.39	94	PCT	11	P2	VS3	-.31			VS3	TEC	.610	NBAZC	2	C
45	90	1.07	79	PCT	16	P3	VS3	-.34		.68	VS3	VS3	.580	NPUFZ	71	H
47	90	1.79	103	PCT	29	P2	BW2	1.17			VS3	TEC	.610	NBAZC	2	C
47	90	2.04	103	PCT	28	P3	BW2	1.24		.41	07C	VS3	.580	NPUFZ	71	C
113	90	.28	109	PCT	10	P2	VS2	.99			VS3	TEH	.610	NBAZC	24	H
113	90	.59	80	PCT	10	P3	VS2	.50		.38	VS2	VS2	.580	NPUFZ	71	H
45	92	.25	124	PCT	7	P2	BW2	-1.01			VS3	TEC	.610	NBAZC	1	C
47	92	.33	28	PCT	9	P2	BW2	1.04			VS3	TEC	.610	NBAZC	1	C
47	92	.41	28	PCT	15	P2	BW1	.91			VS3	TEH	.610	NBAZC	3	H
47	92	1.06	86	PCT	16	P3	BW1	1.21		.33	07H	VS3	.580	NPUFZ	71	H
49	92	1.37	59	PCT	30	P2	BW1	.62			VS3	TEH	.610	NBAZC	3	H
49	92	2.26	86	PCT	29	P3	BW1	1.01		.33	08H	VS3	.580	NPUFZ	71	H
111	92	.20	87	PCT	9	P2	BW1	.80			VS3	TEH	.610	NBAZC	23	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
48	93	.41	118	PCT	11	P2	09C	-1.74			VS3	TEC	.610	NBAZC	2	C
48	93	.70	95	PCT	13	P3	09C	-1.93		.27	08C	VS3	.580	NPUFZ	71	C
47	94	.29	138	PCT	8	P2	VS3	-.71			VS3	TEC	.610	NBAZC	2	C
47	94	.23	90	PCT	7	P2	BW2	.99			VS3	TEC	.610	NBAZC	2	C
47	94	.86	106	PCT	15	P3	VS3	-.71		.48	07C	VS3	.580	NPUFZ	71	C
49	94	.57	120	PCT	14	P2	VS3	-.65			VS3	TEC	.610	NBAZC	2	C
49	94	1.30	90	PCT	19	P3	VS3	-.49		.78	VS3	VS3	.580	NPUFZ	71	H
46	95	1.67	97	PCT	31	P2	BW1	.85			VS3	TEH	.610	NBAZC	4	H
46	95	1.93	96	PCT	26	P3	BW1	1.07		.38	07H	VS3	.580	NPUFZ	71	H
48	95	.28	56	PCT	8	P2	09C	-1.70			VS3	TEC	.610	NBAZC	1	C
52	95	.36	142	PCT	10	P2	VS3	-.80			VS3	TEC	.610	NBAZC	1	C
52	95	1.16	95	PCT	17	P3	VS3	-.78		.50	VS3	VS3	.580	NPUFZ	71	H
56	95	.47	147	PCT	15	P2	VS3	-.46			VS3	TEH	.610	NBAZC	22	H
56	95	1.20	92	PCT	18	P3	VS3	-.71		.45	VS3	VS3	.580	NPUFZ	71	H
47	96	1.31	120	PCT	25	P2	VS3	-.53			VS3	TEC	.610	NBAZC	1	C
47	96	.29	118	PCT	8	P2	BW2	-.96			VS3	TEC	.610	NBAZC	1	C
47	96	.39	50	PCT	11	P2	BW2	1.18			VS3	TEC	.610	NBAZC	1	C
47	96	2.19	90	PCT	28	P3	VS3	-.54		.30	VS3	VS3	.580	NPUFZ	71	H
47	96	1.96	101	PCT	27	P3	VS3	-.54		.50	07C	VS3	.580	NPUFZ	71	C
47	96	.47	98	INR	9	P3	BW2	-.96			07C	VS3	.580	NPUFZ	71	C
47	96	.74	122	PCT	13	P3	BW2	.90		.15	07C	VS3	.580	NPUFZ	71	C
77	96	.20	62	PCT	9	P2	09H	.66			VS3	TEH	.610	NBAZC	23	H
50	97	.69	124	PCT	16	P2	VS3	-.92			VS3	TEC	.610	NBAZC	2	C
50	97	1.36	86	PCT	20	P3	VS3	-.65		.43	VS3	VS3	.580	NPUFZ	71	H
128	97	.18	41	PCT	9	P2	VS3	-1.00			VS3	TEH	.610	NBAZC	23	H
48	99	.26	103	PCT	7	P2	VS3	-.98			VS3	TEC	.610	NBAZC	1	C
48	99	.47	120	PCT	13	P2	VS3	.85			VS3	TEC	.610	NBAZC	1	C
48	99	1.39	113	PCT	26	P2	BW2	1.04			VS3	TEC	.610	NBAZC	1	C
48	99	1.15	126	PCT	23	P2	09C	-1.75			VS3	TEC	.610	NBAZC	1	C
48	99	.86	96	PCT	15	P3	VS3	.65		.27	08C	VS3	.580	NPUFZ	71	C
48	99	1.58	105	PCT	24	P3	BW2	1.04		.42	08C	VS3	.580	NPUFZ	71	C
48	99	1.21	107	PCT	20	P3	09C	-1.73		.38	08C	VS3	.580	NPUFZ	71	C
47	100	.27	99	PCT	12	P2	BW1	1.10			VS3	TEH	.610	NBAZC	3	H
47	100	.92	87	PCT	14	P3	VS3	-.89		.25	07H	VS3	.580	NPUFZ	71	H
113	100	.18	131	PCT	8	P2	VS3	.40			VS3	TEH	.610	NBAZC	21	H
48	101	.43	118	PCT	11	P2	VS3	1.02			VS3	TEC	.610	NBAZC	2	C
48	101	.72	115	PCT	16	P2	09C	-1.77			VS3	TEC	.610	NBAZC	2	C
48	101	.83	84	PCT	13	P3	VS3	.84		.42	VS3	VS3	.580	NPUFZ	71	H
48	101	1.07	109	PCT	18	P3	09C	-1.77		.41	08C	VS3	.580	NPUFZ	71	C
50	101	1.10	108	PCT	22	P2	VS3	.76			VS3	TEC	.610	NBAZC	2	C
50	101	.41	60	PCT	15	P2	BW1	.77			VS3	TEH	.610	NBAZC	3	H
50	101	.97	98	PCT	15	P3	BW1	.71		.40	08H	VS3	.580	NPUFZ	71	H
50	101	1.51	80	PCT	21	P3	VS3	.47		.78	08H	VS3	.580	NPUFZ	71	H
90	101	.18	84	PCT	8	P2	VS2	-.96			VS3	TEH	.610	NBAZC	21	H
90	101	.64	87	PCT	11	P3	VS2	-.99		.10	VS2	VS2	.580	NPUFZ	71	H
108	101	.20	137	PCT	9	P2	BW1	1.99			VS3	TEH	.610	NBAZC	21	H
142	101	.37	139	PCT	12	P2	VS1	.99			VS3	TEH	.610	ZBAZC	32	H
142	101	.97	85	PCT	15	P3	VS1	.62		.23	VS1	VS1	.580	NPUFZ	71	H
49	102	1.29	95	PCT	27	P2	BW1	-.87			VS3	TEH	.610	NBAZC	4	H
49	102	1.27	96	PCT	19	P3	BW1	-1.05		.42	08H	VS3	.580	NPUFZ	71	H

| ROW | COL | VOLTS | DEG | IND | PER | CHN | LOCN | INCH1 | INCH2 | CRLEN | BEGT | ENDT | PDIA | PTYPE | CAL | L |

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
51	102	1.36	86	PCT	25	P2	VS3	.98			VS3	TEC	.610	NBAZC	2	C
51	102	2.15	89	PCT	28	P3	VS3	.74		.56	VS3	VS3	.580	NPUFZ	71	H
53	102	.37	60	PCT	12	P2	VS3	-.90			VS3	TEH	.610	NBAZC	4	H
53	102	.68	94	PCT	11	P3	VS3	-.78		.18	VS3	VS3	.580	NPUFZ	71	H
101	102	.29	145	PCT	11	P2	VS2	-1.05			VS3	TEH	.610	NBAZC	22	H
101	102	.74	89	PCT	12	P3	VS2	-1.00		.28	VS2	VS2	.580	NPUFZ	71	H
48	103	.80	129	PCT	18	P2	VS3	.85			VS3	TEC	.610	NBAZC	1	C
48	103	1.06	117	PCT	22	P2	09C	-1.86			VS3	TEC	.610	NBAZC	1	C
48	103	1.17	125	PCT	25	P2	BW1	-.81			VS3	TEH	.610	NBAZC	4	H
48	103	1.51	108	PCT	23	P3	09C	-1.86		.58	08C	VS3	.580	NPUFZ	71	C
48	103	1.71	98	PCT	28	P3	BW1	-1.11		.57	08H	VS3	.580	NPUFZ	72	H
48	103	.80	85	PCT	16	P3	VS3	1.22		.18	08H	VS3	.580	NPUFZ	72	H
48	103	1.52	87	PCT	26	P3	VS3	1.25		.86	08H	VS3	.580	NPUFZ	72	H
47	104	.54	73	PCT	18	P2	BW1	-1.12			VS3	TEH	.610	NBAZC	3	H
47	104	1.46	82	PCT	31	P2	BW1	.55			VS3	TEH	.610	NBAZC	3	H
47	104	.33	41	PCT	13	P2	VS3	.93			VS3	TEH	.610	NBAZC	3	H
47	104	.95	97	PCT	18	P3	BW1	-1.16		.43	07H	VS3	.580	NPUFZ	72	H
47	104	2.50	89	PCT	35	P3	BW1	.80		.55	07H	VS3	.580	NPUFZ	72	H
47	104	.98	81	PCT	19	P3	VS3	.42		1.68	07H	VS3	.580	NPUFZ	72	H
51	104	.55	76	PCT	18	P2	BW1	.61			VS3	TEH	.610	NBAZC	3	H
51	104	1.09	95	PCT	20	P3	BW1	1.03		.49	08H	VS3	.580	NPUFZ	72	H
77	104	.30	133	PCT	12	P2	09H	.70			VS3	TEH	.610	NBAZC	21	H
48	105	.55	118	PCT	14	P2	09C	-1.25			VS3	TEC	.610	NBAZC	2	C
48	105	.92	106	PCT	16	P3	09C	-1.25		.30	08C	VS3	.580	NPUFZ	71	C
60	105	.19	36	PCT	9	P2	VS2	1.00			VS3	TEH	.610	NBAZC	21	H
47	106	.30	147	PCT	9	P2	BW2	1.02			VS3	TEC	.610	NBAZC	2	C
67	106	.33	144	PCT	12	P2	VS3	-.74			VS3	TEH	.610	NBAZC	22	H
67	106	.62	93	PCT	13	P3	VS3	-.95		.31	VS3	VS3	.580	NPUFZ	72	H
77	106	.41	144	PCT	14	P2	VS3	-.89			VS3	TEH	.610	NBAZC	22	H
77	106	.81	82	PCT	16	P3	VS3	-1.03		.34	VS3	VS3	.580	NPUFZ	72	H
48	107	1.85	97	PCT	30	P2	09C	-1.62			VS3	TEC	.610	NBAZC	1	C
48	107	2.30	99	PCT	30	P3	09C	-1.54		.67	08C	VS3	.580	NPUFZ	71	C
47	108	.22	103	PCT	6	P2	BW2	.87			VS3	TEC	.610	NBAZC	1	C
87	108	.52	112	PCT	14	P2	VS4	-.73			VS3	TEC	.610	NBAZC	39	C
87	108	1.11	107	PCT	18	P3	VS4	-.73		.34	VS4	VS4	.580	NPUFZ	71	C
115	108	.30	79	PCT	12	P2	VS2	.80			VS3	TEH	.610	NBAZC	21	H
115	108	.91	85	PCT	18	P3	VS2	.79		.40	VS2	VS2	.580	NPUFZ	72	H
48	109	.22	124	PCT	7	P2	VS3	.96			VS3	TEC	.610	NBAZC	2	C
48	109	1.57	108	PCT	27	P2	09C	-1.25			VS3	TEC	.610	NBAZC	2	C
48	109	.62	93	PCT	12	P3	VS3	.96		.32	08C	VS3	.580	NPUFZ	71	C
48	109	1.79	111	PCT	26	P3	09C	-1.25		.44	08C	VS3	.580	NPUFZ	71	C
70	109	.18	119	PCT	8	P2	VS3	.41			VS3	TEH	.610	NBAZC	21	H
59	110	.17	130	PCT	7	P2	BW1	1.03			VS3	TEH	.610	NBAZC	20	H
99	110	.19	141	PCT	7	P2	VS2	.49			VS3	TEH	.610	NBAZC	20	H
46	113	.41	126	PCT	11	P2	VS3	-.90			VS3	TEC	.610	NBAZC	2	C
46	113	1.19	97	PCT	22	P3	VS3	-.72		.66	VS3	VS3	.580	NPUFZ	72	H
48	113	.49	130	PCT	13	P2	BW2	-.83			VS3	TEC	.610	NBAZC	2	C
48	113	.70	115	PCT	13	P3	BW2	-.83		.20	08C	VS3	.580	NPUFZ	71	C
43	114	.35	124	PCT	10	P2	BW2	-.84			VS3	TEC	.610	NBAZC	2	C
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
85	114	.24	135	PCT	9	P2	VS2	.70			VS3	TEH	.610	NBAZC	20	H
85	114	.77	76	PCT	16	P3	VS2	.89		.34	VS2	VS2	.580	NPUFZ	72	H
44	115	.19	128	PCT	6	P2	BW2	-.97			VS3	TEC	.610	NBAZC	2	C
44	115	.49	52	INR	9	P3	BW2	-.97			07C	VS3	.580	NPUFZ	71	C
46	115	.36	56	PCT	10	P2	BW2	-.89			VS3	TEC	.610	NBAZC	2	C
48	115	.32	146	PCT	9	P2	09C	-1.25			VS3	TEC	.610	NBAZC	2	C
48	115	.65	86	PCT	12	P3	09C	-1.22		.27	08C	VS3	.580	NPUFZ	71	C
44	117	.42	114	PCT	11	P2	BW2	-.92			VS3	TEC	.610	NBAZC	1	C
44	117	.72	97	PCT	13	P3	BW2	-.92		.36	07C	VS3	.580	NPUFZ	71	C
82	117	.13	53	PCT	6	P2	BW1	-.99			VS3	TEH	.610	NBAZC	19	H
166	117	.27	152	PCT	10	P2	VS1	-.80			VS3	TEH	.610	ZBAZC	30	H
166	117	.62	84	PCT	13	P3	VS1	-.91		.46	VS1	VS1	.580	NPUFZ	72	H
88	119	.16	135	PCT	6	P2	08H	.65			VS3	TEH	.610	NBAZC	20	H
41	120	.22	57	PCT	7	P2	BW2	-.85			VS3	TEC	.610	NBAZC	4	C
45	120	.72	120	PCT	16	P2	VS3	-.95			VS3	TEC	.610	NBAZC	2	C
45	120	1.18	92	PCT	21	P3	VS3	-1.24		.61	VS3	VS3	.580	NPUFZ	72	H
119	120	.25	83	PCT	10	P2	VS3	-.73			VS3	TEH	.610	NBAZC	19	H
119	120	.53	87	PCT	12	P3	VS3	-.76		.34	VS3	VS3	.580	NPUFZ	72	H
58	121	.25	81	PCT	10	P2	VS3	.59			VS3	TEH	.610	NBAZC	19	H
110	121	.18	114	PCT	8	P2	BW1	-.64			VS3	TEH	.610	NBAZC	19	H
112	121	.16	39	PCT	7	P2	BW1	-1.15			VS3	TEH	.610	NBAZC	19	H
118	123	.33	144	PCT	11	P2	VS2	1.21			VS3	TEH	.610	NBAZC	20	H
118	123	1.07	94	PCT	20	P3	VS2	1.07		.69	VS2	VS2	.580	NPUFZ	72	H
120	123	.53	145	PCT	15	P2	VS2	1.04			VS3	TEH	.610	NBAZC	20	H
120	123	.97	93	PCT	19	P3	VS2	.94		.60	VS2	VS2	.580	NPUFZ	72	H
121	124	.24	67	PCT	10	P2	VS1	.98			VS3	TEH	.610	NBAZC	19	H
121	124	.62	85	PCT	13	P3	VS1	.81		.36	VS1	VS1	.580	NPUFZ	72	H
28	125	.30	124	PCT	10	P2	08H	.65			VS3	TEH	.610	NBAZC	4	H
28	125	.66	81	PCT	14	P3	08H	1.06		.37	07H	VS3	.580	NPUFZ	72	H
120	125	.41	82	PCT	15	P2	VS2	.78			VS3	TEH	.610	NBAZC	19	H
120	125	1.15	91	PCT	21	P3	VS2	1.00		.39	VS2	VS2	.580	NPUFZ	72	H
16	129	.22	89	PCT	7	P2	VS3	.95			VS3	TEC	.610	NBAZC	4	C
16	129	.55	103	PCT	12	P3	VS3	.90		.33	VS3	VS3	.580	NPUFZ	72	H
68	129	.47	55	PCT	17	P2	VS2	.81			VS3	TEH	.610	NBAZC	17	H
68	129	1.51	82	PCT	25	P3	VS2	.77		.52	VS2	VS2	.580	NPUFZ	72	H
119	132	.39	73	PCT	15	P2	VS2	1.05			VS3	TEH	.610	NBAZC	17	H
119	132	1.00	97	PCT	19	P3	VS2	.95		.49	VS2	VS2	.580	NPUFZ	72	H
90	143	.20	83	PCT	7	P2	10H	-1.41			VS3	TEH	.610	NBAZC	16	H
116	145	.28	71	PCT	12	P2	BW1	.99			VS3	TEH	.610	NBAZC	15	H
116	145	.45	93	PCT	10	P3	BW1	.62		.18	09H	VS1	.580	NPUFZ	72	H
48	147	.26	132	PCT	8	P2	09C	-1.43			VS3	TEC	.610	NBAZC	34	C
48	147	.57	110	INR	10	P3	09C	-1.43			08C	VS3	.580	NPUFZ	72	C
126	147	.36	112	PCT	11	P2	VS3	-.71			VS3	TEH	.610	NBAZC	16	H
126	147	.97	83	PCT	19	P3	VS3	-.88		.46	VS3	VS3	.580	NPUFZ	72	H

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
65	148	.28	138	PCT	10	P2	VS3	-.69			VS3	TEH	.610	NBAZC	14	H
65	148	.43	93	PCT	10	P3	VS3	-.88		.24	VS3	VS3	.580	NPUFZ	72	H
131	150	.26	97	PCT	9	P2	VS1	.97			VS3	TEH	.610	NBAZC	16	H
48	151	.21	86	PCT	7	P2	09C	-1.48			VS3	TEC	.610	NBAZC	32	C
50	151	.18	146	PCT	6	P2	VS3	-.43			VS3	TEC	.610	NBAZC	32	C
110	151	.32	102	PCT	10	P2	VS2	-.79			VS3	TEH	.610	NBAZC	16	H
110	151	.52	83	PCT	11	P3	VS2	-.51		.21	VS2	VS2	.580	NPUFZ	72	H
134	151	.34	64	PCT	11	P2	VS3	-.79			VS3	TEH	.610	NBAZC	16	H
134	151	.61	80	PCT	13	P3	VS3	-1.25		.27	VS3	VS3	.580	NPUFZ	72	H
81	152	.32	60	PCT	9	P2	09C	-1.00			VS3	TEC	.610	NBAZC	37	C
81	152	.59	71	PCT	10	P3	09C	-.84		.40	08C	VS4	.580	NPUFZ	72	C
144	157	.29	93	PCT	12	P2	VS3	-.98			VS3	TEH	.610	NBAZC	27	H
144	157	.87	86	PCT	17	P3	VS3	-1.12		.37	VS3	VS3	.580	NPUFZ	72	H
48	161	.39	123	PCT	11	P2	09C	-1.70			VS3	TEC	.610	NBAZC	31	C
48	161	.64	66	PCT	11	P3	09C	-1.73		.30	08C	VS3	.580	NPUFZ	72	C
111	164	.35	152	PCT	11	P2	VS3	-1.15			VS3	TEH	.610	NBAZC	16	H
111	164	.94	93	PCT	18	P3	VS3	-.89		.49	VS3	VS3	.580	NPUFZ	72	H
47	166	.23	125	PCT	7	P2	VS3	-.53			VS3	TEC	.610	NBAZC	32	C
111	166	.43	82	PCT	16	P2	VS3	-.83			VS3	TEH	.610	NBAZC	15	H
111	166	.78	89	PCT	16	P3	VS3	-.80		.49	VS3	VS3	.580	NPUFZ	72	H
131	166	.25	95	PCT	11	P2	VS3	-.94			VS3	TEH	.610	NBAZC	15	H
131	166	.64	70	PCT	13	P3	VS3	-.99		.31	VS3	VS3	.580	NPUFZ	72	H
128	169	.26	142	PCT	11	P2	VS3	-1.04			VS3	TEH	.610	NBAZC	15	H
128	169	.54	72	PCT	12	P3	VS3	-1.10		.34	VS3	VS3	.580	NPUFZ	72	H
125	170	.43	128	PCT	16	P2	VS3	.35			VS3	TEH	.610	NBAZC	15	H
125	170	.91	80	PCT	18	P3	VS3	.55		.37	VS3	VS3	.580	NPUFZ	72	H
122	171	.48	112	PCT	17	P2	VS3	-1.04			VS3	TEH	.610	NBAZC	15	H
122	171	.91	91	PCT	18	P3	VS3	-.95		.40	VS3	VS3	.580	NPUFZ	72	H
122	173	.42	135	PCT	16	P2	VS3	-1.00			VS3	TEH	.610	NBAZC	15	H
122	173	.28	104	PCT	12	P2	VS3	.67			VS3	TEH	.610	NBAZC	15	H
122	173	.94	91	PCT	18	P3	VS3	-1.11		.43	VS3	VS3	.580	NPUFZ	72	H
122	173	.61	96	PCT	13	P3	VS3	.80		.49	VS3	VS3	.580	NPUFZ	72	H
1	178	.25	84	SVI	35	P3	TSH	.33		.42	TSH	01H	.600	ZPAHZ	70	H
1	178	.31	66	SVI	38	P3	TSH	.69		.24	TSH	01H	.600	ZPAHZ	70	H
3	178	.26	70	SVI	36	P3	TSH	.61		.51	TSH	01H	.600	ZPAHZ	70	H
2	179	.38	82	SVI	41	P3	TSH	1.63		.33	TSH	01H	.600	ZPAHZ	70	H
48	179	.38	130	PCT	11	P2	09C	-1.58			VS3	TEC	.610	NBAZC	30	C
48	179	.79	104	PCT	13	P3	09C	-1.07		.45	08C	VS3	.580	NPUFZ	73	C
98	179	.70	112	PCT	18	P2	VS3	.20			VS3	TEH	.610	NBAZC	10	H
98	179	1.07	83	PCT	20	P3	VS3	.72		.85	VS3	VS3	.580	NPUFZ	72	H
106	181	.28	115	PCT	11	P2	VS3	-.86			VS3	TEH	.610	NBAZC	9	H
106	181	.73	85	PCT	15	P3	VS3	-1.02		.37	VS3	VS3	.580	NPUFZ	72	H
48	185	.39	134	PCT	10	P2	09C	-1.32			VS3	TEC	.610	NBAZC	29	C
48	185	.57	102	PCT	10	P3	09C	-1.36		.21	08C	VS3	.580	NPUFZ	73	C
54	187	.28	108	PCT	9	P2	BW1	-1.16			VS3	TEH	.610	NBAZC	8	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

APPENDIX D

PLI & PLP

DATA SHEETS

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
164	75	1.03	130	PLP		5	10C	-2.33			10C	10C	.600	ZPAHZ	80	C
165	76	.71	119	PLP		5	10C	-2.43			10C	10C	.600	ZPAHZ	80	C
3	192	.95	77	PLP		8	04H	-3.08			04H	04H	.600	ZPAHZ	58	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L
105	104	.66	67	PLP		8	08H	1.75			08H	08H	.600	ZPAHZ	70	H
108	105	.32	67	PLP		8	08H	2.31			08H	08H	.600	ZPAHZ	70	H
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L

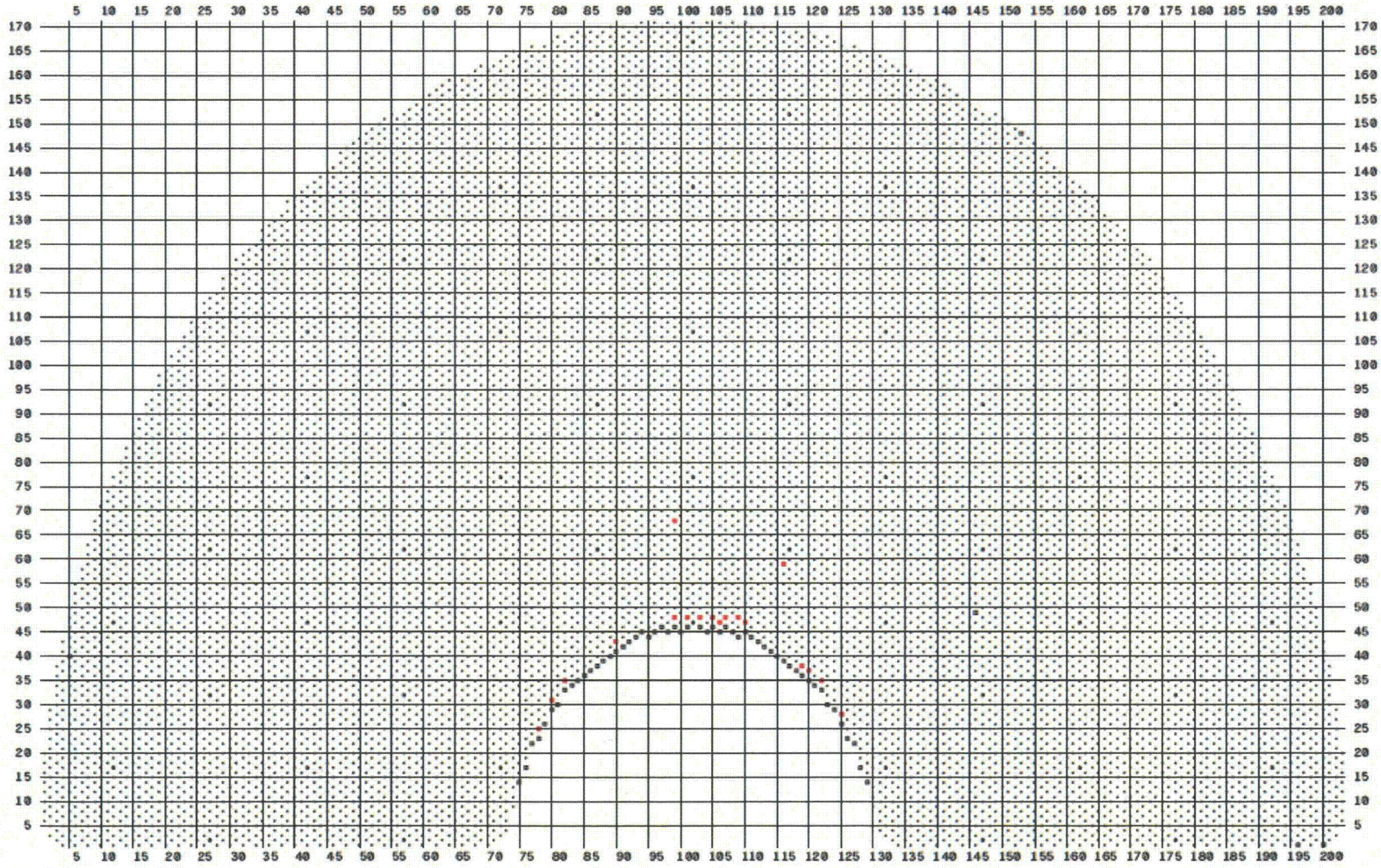
APPENDIX E

PLUG MAPS

SG - 11 Tubes Plugged in U1R15

Palo Verde U1R15 PVNGS1 1RSG

- 59 Plugged Tube
- 53 Stay Rod
- 18 Tube Plugged in U1R15

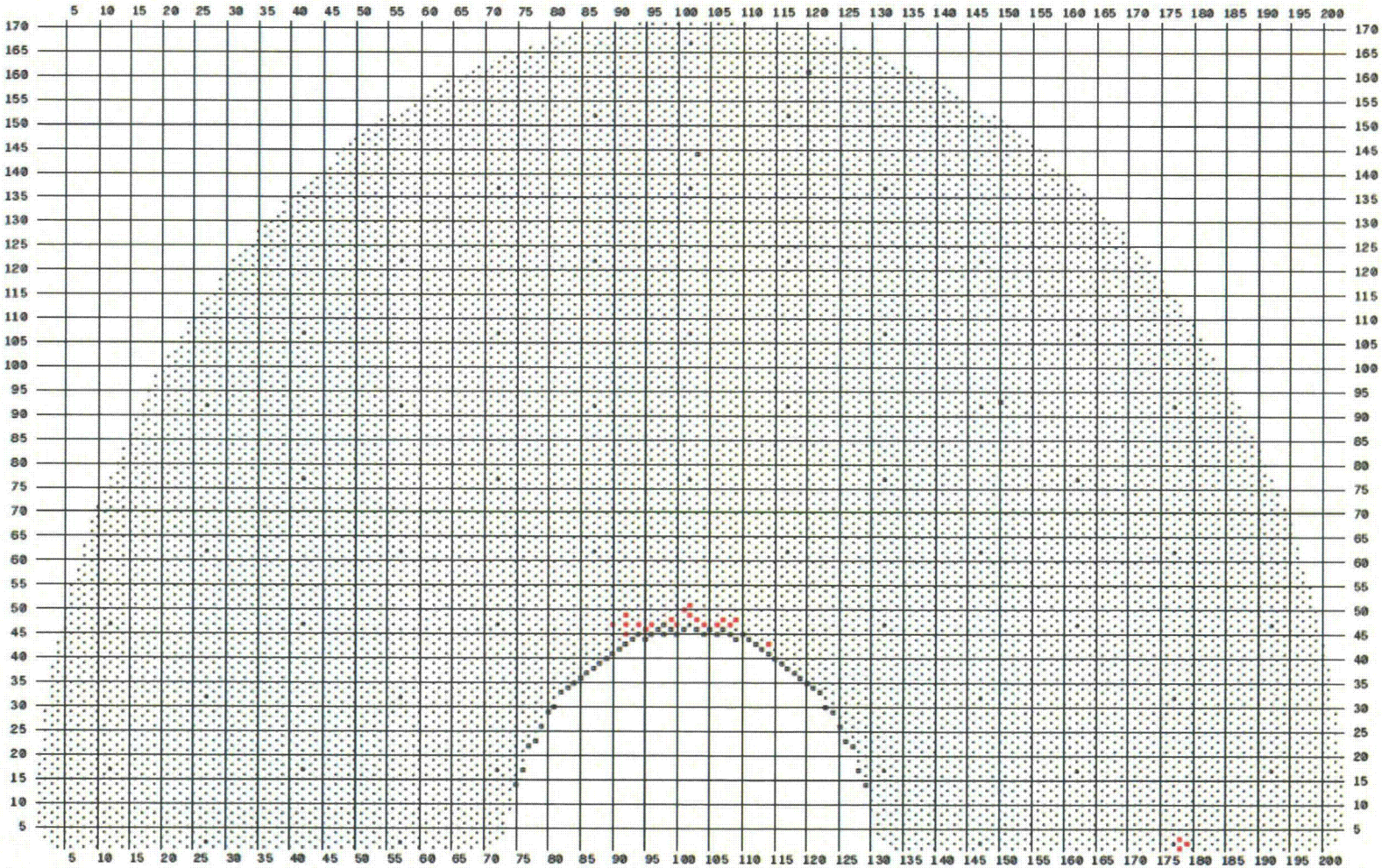


Westinghouse Electric Company LLC - ST Max 04/25/2010 14:55:27

SG - 12 Tubes Plugged in U1R15

Palo Verde U1R15 PVNGS1 1RSG

- 53 Stay Rod
- 58 Plugged Tube
- 22 Tube Plugged In U1R15



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APPENDIX F

FORM NIS-1

APS	NIS – 1 FORM OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS
1. OWNER	**ARIZONA PUBLIC SERVICE COMPANY, et al**
1a. ADDRESS	P. O. BOX 52034; PHOENIX, ARIZONA 85072
2. PLANT	PALO VERDE NUCLEAR GENERATING STATION
2a. ADDRESS	5801 SOUTH WINTERSBURG ROAD, TONOPAH, ARIZONA 85354
3. UNIT NUMBER	1

4. OWNERS CERTIFICATE OF AUTHORIZATION	NONE
5. COMMERCIAL SERVICE DATE	1-28-86

6. COMPONENTS INSPECTED:

COMPONENT OR APPURTENANCE	MANUFACTURER OR INSTALLER	SERIAL NUMBER	STATE OR PROVINCE	NATIONAL BOARD NO
1MRCEE01A STEAM GENERATOR 11	Ansaldo	224	NA	173
1MRCEE01B STEAM GENERATOR 12	Ansaldo	225	NA	174

APS	NIS – 1 BACK OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS

7. EXAM DATES	**April 2010**
8. INSPECTION INTERVAL	**7-18-08 to 7-1-18**

9. ABSTRACT OF EXAMINATIONS. INCLUDE A LIST OF EXAMINATIONS AND A STATEMENT CONCERNING STATUS OF WORK REQUIRED FOR CURRENT INTERVAL.

Table 1 in the report summary section documents the number and type of each examination performed.

A summary of the tubes with indications of degradation is listed in Appendix B and C of this report for SG 11 and 12 respectively. The tubes identified below were plugged as a result of this examination.

SG 11			
ROW	LINE	ROW	LINE
25	78	47	106
31	80	48	107
35	92	48	109
43	90	47	110
49	99	59	116
69	99	36	119
49	101	37	120
49	103	35	122
48	105	26	125

SG 12			
ROW	LINE	ROW	LINE
47	90	51	102
45	92	49	103
47	92	47	104
49	92	47	106
47	94	48	107
46	95	47	109
47	96	48	109
49	99	43	114
47	100	1	178
50	101	3	178
49	102	2	179

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.

DATE_____SIGNED: ARIZONA PUBLIC SERVICE COMPANY BY Hansen, Douglas B(Z41530) Digitally signed by Hansen, Douglas B(Z41530) DN: cn=Hansen, Douglas B(Z41530) Reason: I have reviewed this document Date: 2010.10.26 14:54:23 -07'00'

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 OF PROVINCE OF ARIZONA EMPLOYED BY HSB CT OF HARTFORD, CONNECTICUT HAVE INSPECTED THE COMPONENTS DESCRIBED IN THIS OWNERS REPORT DURING THE PERIOD April 2010 TO Oct. 2010, AND STATE THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE OWNER HAS PERFORMED EXAMINATIONS AND TAKEN CORRECTIVE MEASURES DESCRIBED IN THIS OWNERS 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 OWNERS REPORT. FURTHERMORE, NEITHER THE INSPECTOR NOR HIS EMPLOYER SHALL BE LIABLE IN ANY MANNER FOR ANY PERSONAL INJURY OR PROPERTY DAMAGE OR A LOSS OF ANY KIND ARISING FROM OR CONNECTED WITH THIS INSPECTION.

INSPECTOR Hogstrom, Robert (YH2450) Digitally signed by Hogstrom, Robert (YH2450) DN: cn=Hogstrom, Robert (YH2450) Reason: I have reviewed this document Date: 2010.10.26 15:22:52 -07'00' COMMISSIONS NB 9685 "N" "I" Az 264
NATL' BOARD, STATE, PROVINCE

DATE October 26, 2010