Technical Specification 5.6.8

Palo Verde Nuclear Generating Station

Thomas N. Weber
Department Leader
Regulatory Affairs

Tel. 623-393-5764
Fax 623-393-5442

Mail Station 7636
PO Box 52034
Phoenix, Arizona 85072-2034

102-06003-TNW/RJR
May 08, 2009

ATTN: Document Control Desk
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 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 fourteenth refueling outage.

By copy of this letter and the enclosure, this report is being provided to the NRC Region IV Regional Administrator and the PVNGS Resident Inspector.

No commitments are being made to the NRC by this letter.

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

Sincerely,

Thomas N. Weber

TNW/RAS/RJR/gat

Attachment

cc:

E. E. Collins Jr.	NRC Region IV Regional Administrator
J. R. Hall	NRC NRR Project Manager
R. I. Treadway	NRC Senior Resident Inspector

A001

Attachment

Unit 1 – 14th Refueling Outage
Steam Generator Tube Inspection Report

Palo Verde Nuclear Generating Station

UNIT 1
U1R14

ARIZONA PUBLIC SERVICE
P. O. BOX 52034
PHOENIX, AZ 85072

Prepared by: Douglas B Hansen DBH — Date: 3-29-09

Reviewed by: Wayne Lewis — Date: 4/1/09

Approved by: AB Haley — Report Date: 4/1/09

Commercial Service Date: 1-28-86

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UNIT 1

STEAM GENERATOR EDDY CURRENT

U1 R14 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 14th refueling outage in Unit 1 (U1R14) was conducted during October 2008. Mode 4 entry of Unit 1 Cycle 15 was entered on November 13, 2008. 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 second examination performed in Unit 1 following steam generator replacement in U1R12. This examination is considered a 100% full length tubing inspection (see Table 1) with the Row 1-4 u-bends inspected via rotating coil in lieu of bobbin due to access limitations of the selected bobbin probe sizes.

The examinations resulted in a total of 0 tubes being plugged in SG 11, and **1** tube being plugged in SG 12. A description of the previous plugging history for these replacement steam generators is contained in Appendix E.

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, with the exception of Row 1 thru 4 short radius u-bends that were examined with rotating coil examination techniques.

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. 11 6-2007	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 0.540" 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 primary data analysis. Anatec International, Inc. provided the secondary 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.

Appendix D contains the possible loose part (PLP) indications and the associated history. All of the PLP indications in SG 11 were identified last outage. Whereas those identified in SG12 are new.

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 1 tube was plugged this outage. The damage mechanism was noted as wear. The tube was located in the central cavity area and was plugged due to a 22% wear indication at the BW2 location.

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. No defects exceeding the Technical Specification repair limits were identified. 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 14. No tube pulls or insitu pressure testing were required based on the results of the examinations.

Tubesheet Annulus 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 either of the steam generator's tubesheet annulus regions. On the hot leg side of RSG11, a small piece of plastic (possibly a bullet nose) was found and removed. No loose parts were identified in the hot leg side of RSG 12. One (1) loose part was identified on the cold leg side of RSG 11; a small piece of weld wire (~4 inches long x 1/64th" diameter), which was removed. No loose parts were identified in the cold leg side of RSG 12.

None of the parts described above were observed during eddy current examinations. 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.

As noted in Table 2, 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. The locations are in areas not accessible by visual exams. All of the PLP calls in SG11 were observed in the previous inspection (U1R13) with continued no evidence of wear (R164C75, R165C76, R3C192). The PLP calls in SG12 are new (R105C104, R108C105). 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 U1R14 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	12245	12245
HOT LEG BOBBIN	TEH-VS3	12245	12245
COLD STRAIGHT SECTION BOBBIN *	TEC-08C	276	278
HOT STRAIGHT SECTION BOBBIN *	TEH-08H	276	278
ROW 1 THRU 4 SHORT RADIUS U-BENDS *	08C-08H	276	278
HOT STRAIGHT RC	VARIOUS	6	29
HOT U & SQUARE BEND RC	VARIOUS	56	49
COLD STRAIGHT RC	VARIOUS	14	2
COLD U & SQUARE BEND RC	VARIOUS	17	16

Notes:

1. * RC examinations were performed on Row 1 thru 4 short radius U-Bends in lieu of bobbin examination.

TABLE 2

INDICATION SUMMARY

DAMAGE MECHANISM	STEAM GENERATOR 11	STEAM GENERATOR 12
WEAR		
0% - 20%	61	51
20% - 39%	3	4
≥ 40%	0	0
PLUGGED	(0)	(1)
Possible Loose Parts (RC)		
PLI	0	0
PLP	3	2
PLUGGED	(0)	(0)
Volumetric Indications		
SVI/MVI	0	0
PLUGGED	(0)	(0)
PREVENTATIVE	(0)	(0)
PLUGGED	**(0)**	**(1)**
TOTAL PLUGGED / %	**(59 / 0.5%)**	**(58 / 0.5%)**

NOTES

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

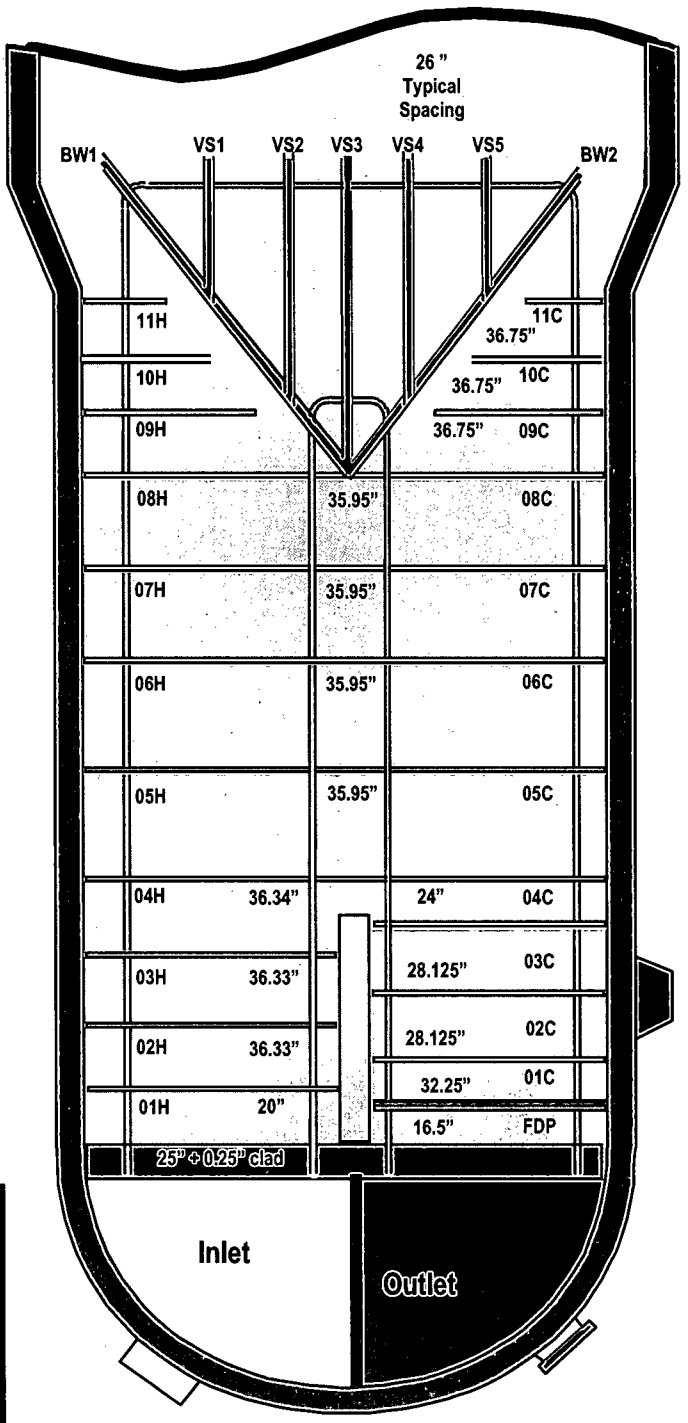
APPENDIX A

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	COM
11	2	2.17	179	DNT		P1	08H	-.91			VS3	TEH	.610	ZBAZC	43	H	
51	8	.94	122	MBM		6	07H	23.70			VS3	TEH	.610	ZBAZC	36	H	
55	12	1.22	72	MBM		6	05H	20.44			VS3	TEH	.610	NBAZC	34	H	
43	14	.56	81	MBM		6	04C	5.58			VS3	TEC	.610	ZBAZC	11	C	
56	15	.52	72	MBM		6	07C	23.36			VS3	TEC	.610	ZBAZC	13	C	
50	21	4.35	183	DNT		P1	08C	9.99			VS3	TEC	.610	ZBAZC	10	C	
54	21	2.82	179	DNT		P1	08C	24.23			VS3	TEC	.610	ZBAZC	15	C	
29	26	3.61	179	DNT		P1	BW1	1.59			VS3	TEH	.610	NBAZC	37	H	
113	26	5.94	177	DNT		P1	TSC	1.95			VS3	TEC	.610	ZBAZC	15	C	
50	29	2.67	183	DNT		P1	VS3	-.46			VS3	TEC	.610	ZBAZC	10	C	
31	30	.25	75	PCT	8	P2	VS3	.60			VS3	TEC	.610	ZBAZC	9	C	
29	36	.71	128	MBM		6	02H	22.62			VS3	TEH	.610	ZBAZC	36	H	
29	36	.61	122	MBM		6	02H	26.34			VS3	TEH	.610	ZBAZC	36	H	
109	36	.31	117	PCT	9	P2	VS2	-.99			VS3	TEH	.610	NBAZC	32	H	
109	36	.95	108	PCT	16	P3	VS2	-.99		.34	VS2	VS2	.580	NPUFZ	60	H	DQA
52	37	.21	149	NQI		3	TSC	5.07			VS3	TEC	.610	ZBAZC	7	C	
113	38	.23	91	PCT	9	P2	VS2	-1.00			VS3	TEH	.610	NBAZC	33	H	
113	38	.15	104	PCT	6	P2	VS3	-.87			VS3	TEH	.610	NBAZC	33	H	
113	38	.65	102	PCT	12	P3	VS2	-.97			VS2	VS2	.580	NPUFZ	60	H	
113	38	.32	95	PCT	6	P3	VS3	-.84			VS3	VS3	.580	NPUFZ	60	H	
49	40	.34	83	MBM		6	02H	14.85			VS3	TEH	.610	ZBAZC	38	H	
49	46	.59	84	MBM		6	07C	9.12			VS3	TEC	.610	ZBAZC	8	C	
121	46	.45	120	PCT	16	P2	VS2	-.97			VS3	TEH	.610	NBAZC	33	H	
121	46	.96	92	PCT	16	P3	VS2	-.98		.60	VS2	VS2	.580	NPUFZ	60	H	
57	48	.75	75	MBM		6	08C	9.87			VS3	TEC	.610	ZBAZC	19	C	
141	48	2.04	178	DNT		P1	11H	-1.14			VS3	TEH	.610	NBAZC	26	H	
90	49	.16	53	PCT	6	P2	10H	-1.72			VS3	TEH	.610	NBAZC	33	H	
90	49	.54	105	PCT	10	P3	10H	-1.60			10H	10H	.580	NPUFZ	60	H	
129	50	.18	57	PCT	7	P2	VS2	-.78			VS3	TEH	.610	NBAZC	27	H	
129	50	.47	130	PCT	9	P3	VS2	-.93			VS2	VS2	.580	NPUFZ	60	H	
143	50	3.14	178	DNT		P1	11H	-1.20			VS3	TEH	.610	NBAZC	27	H	
135	52	.26	96	PCT	8	P2	VS1	-.70			VS3	TEH	.610	NBAZC	26	H	
135	52	.58	95	PCT	11	P3	VS1	-.88			VS1	VS1	.580	NPUFZ	60	H	
152	55	18.11	176	DNT		P1	TSC	.53			VS3	TEC	.610	ZBAZC	38	C	
135	56	2.51	178	DNT		P1	VS1	1.06			VS3	TEH	.610	NBAZC	26	H	
149	56	3.63	179	DNT		P1	11H	-1.15			VS3	TEH	.610	NBAZC	26	H	
90	57	.34	98	PCT	12	P2	10H	-1.53			VS3	TEH	.610	NBAZC	31	H	
90	57	.69	88	PCT	12	P3	10H	-1.58			10H	10H	.580	NPUFZ	60	H	DQA
137	60	.35	115	PCT	10	P2	VS1	-.82			VS3	TEH	.610	NBAZC	26	H	
137	60	.89	99	PCT	16	P3	VS1	-.81		.52	VS1	VS1	.580	NPUFZ	61	H	
139	62	.22	28	PCT	9	P2	VS1	-.67			VS3	TEH	.610	NBAZC	27	H	
139	62	.74	96	PCT	13	P3	VS1	-.87			VS1	VS1	.580	NPUFZ	61	H	

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

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
41	64	.71	78	MBM		6	04C	14.66			VS3	TEC	.610	ZBAZC	7	C	
26	65	.54	71	MBM		6	08H	7.62			VS3	TEH	.610	NBAZC	1	H	
73	66	.35	19	NQI		P1	TSC	10.06			VS3	TEC	.610	ZBAZC	21	C	
132	67	.25	83	PCT	8	P2	11H	-1.58			VS3	TEH	.610	NBAZC	26	H	
132	67	.47	87	PCT	9	P3	11H	-1.58			11H	11H	.580	NPUFZ	61	H	
25	68	.09	92	NQI		P1	VS3	1.76			VS3	TEC	.610	ZBAZC	7	C	
31	68	.57	88	MBM		6	05C	2.66			VS3	TEC	.610	ZBAZC	7	C	
24	69	1.03	75	MBM		6	05H	2.39			VS3	TEH	.610	NBAZC	1	H	
32	69	.64	78	MBM		6	06C	27.66			VS3	TEC	.610	ZBAZC	7	C	
90	69	.17	95	PCT	6	P2	10H	-1.57			VS3	TEH	.610	NBAZC	30	H	
90	69	.60	109	PCT	11	P3	10H	-1.69			10H	10H	.580	NPUFZ	60	H	
130	69	.18	22	PCT	7	P2	VS1	-.75			VS3	TEH	.610	NBAZC	27	H	
130	69	.58	83	PCT	11	P3	VS1	-.73			VS1	VS1	.580	NPUFZ	60	H	
119	70	.37	81	PCT	11	P2	VS2	-.97			VS3	TEH	.610	NBAZC	30	H	
119	70	1.25	98	PCT	20	P3	VS2	-.83		.42	VS2	VS2	.580	NPUFZ	60	H	
153	70	5.33	180	DNT		P1	VS2	1.91			VS3	TEH	.610	NBAZC	27	H	
153	70	.25	29	DNT		2	VS2	.95			VS2	VS2	.580	NPUFZ	61	H	
73	72	.15	130	NQI		3	FDP	11.84			VS3	TEC	.610	ZBAZC	22	C	
73	72	.14	102	NQI		3	TSC	5.73			VS3	TEC	.610	ZBAZC	22	C	
73	72	.07	91	NQI		3	TSC	8.06			VS3	TEC	.610	ZBAZC	22	C	
32	73	.73	73	MBM		6	08C	10.89			VS3	TEC	.610	ZBAZC	5	C	
42	75	.84	78	MBM		6	FDP	7.29			VS3	TEC	.610	ZBAZC	6	C	
90	75	.18	117	PCT	7	P2	10H	-1.67			VS3	TEH	.610	NBAZC	29	H	
90	75	.58	106	PCT	10	P3	10H	-1.61			10H	10H	.580	NPUFZ	60	H	DQA
25	76	.76	86	MBM		6	05H	32.09			VS3	TEH	.610	NBAZC	1	H	
25	76	.72	61	MBM		6	07H	2.80			VS3	TEH	.610	NBAZC	1	H	
89	78	3.41	181	DNT		P1	VS4	10.63			VS3	TEC	.610	ZBAZC	13	C	
38	79	.17	113	PCT	7	P2	VS3	-.60			VS3	TEH	.610	NBAZC	2	H	
38	79	.37	79	PCT	7	P3	VS3	-1.01			VS3	VS3	.580	NPUFZ	61	H	
90	79	.18	66	PCT	7	P2	10H	-1.55			VS3	TEH	.610	NBAZC	29	H	
90	79	.47	81	PCT	9	P3	10H	-1.37			10H	10H	.580	NPUFZ	60	H	DQA
132	79	.18	40	PCT	6	P2	11H	-1.68			VS3	TEH	.610	NBAZC	24	H	
132	79	.34	84	PCT	6	P3	11H	-1.50			11H	11H	.580	NPUFZ	61	H	DQA
60	81	.27	108	PCT	9	P2	BW1	.96			VS3	TEH	.610	NBAZC	28	H	
60	81	.70	93	PCT	12	P3	BW1	1.40			09H	VS2	.580	NPUFZ	58	H	
136	81	.19	152	PCT	8	P2	VS2	.95			VS3	TEH	.610	NBAZC	25	H	
136	81	.53	85	PCT	10	P3	VS2	.73			VS2	VS2	.580	NPUFZ	61	H	DQA
47	82	.20	111	PCT	8	P2	BW1	.96			VS3	TEH	.610	NBAZC	4	H	
47	82	.47	64	PCT	9	P3	BW1	1.04			08H	VS3	.580	NPUFZ	59	H	DQA
44	83	.19	122	PCT	7	P2	BW1	-1.11			VS3	TEH	.610	NBAZC	4	H	
44	83	.32	124	PCT	12	P2	BW1	.96			VS3	TEH	.610	NBAZC	4	H	
44	83	.49	123	PCT	9	P3	BW1	-.95			08H	VS3	.580	NPUFZ	61	H	DQA
44	83	.64	95	PCT	12	P3	BW1	.99			08H	VS3	.580	NPUFZ	61	H	DQA
48	83	.40	114	PCT	14	P2	BW1	1.04			VS3	TEH	.610	NBAZC	4	H	
48	83	.51	77	PCT	10	P3	BW1	.82			09H	VS3	.580	NPUFZ	61	H	DQA
48	83	.47	119	PCT	9	P3	VS3	-.94			09H	VS3	.580	NPUFZ	61	H	DQA

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

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
47	84	.33	72	PCT	10	P2	BW1	.87			VS3	TEH	.610	NBAZC	3	H	
47	84	.72	88	PCT	13	P3	BW1	.97			08H	VS3	.580	NPUFZ	59	H	DQA
132	85	.15	28	PCT	5	P2	11C	-1.52			VS3	TEC	.610	ZBAZC	34	C	
132	85	.45	74	PCT	9	P3	11C	-1.52			11C	11C	.580	NPUFZ	67	C	DQA
39	86	.44	115	PCT	15	P2	VS3	-.74			VS3	TEH	.610	NBAZC	4	H	
39	86	.83	86	PCT	14	P3	VS3	-1.23			VS3	VS3	.580	NPUFZ	58	H	
43	86	.19	131	PCT	8	P2	BW1	.94			VS3	TEH	.610	NBAZC	4	H	
43	86	.49	87	PCT	9	P3	BW1	.92			08H	VS3	.580	NPUFZ	59	H	DQA
45	86	.24	119	PCT	9	P2	BW1	.96			VS3	TEH	.610	NBAZC	4	H	
45	86	.34	118	PCT	6	P3	BW1	.82			08H	VS3	.580	NPUFZ	59	H	
46	87	.22	137	PCT	8	P2	BW1	.89			VS3	TEH	.610	NBAZC	4	H	
46	87	.47	97	PCT	9	P3	BW1	.95			08H	VS3	.580	NPUFZ	59	H	DQA
48	87	.27	99	PCT	8	P2	09C	-1.47			VS3	TEC	.610	ZBAZC	6	C	
48	87	.58	74	PCT	12	P3	09C	-1.47			09C	09C	.580	NPUFZ	67	C	DQA
45	88	.18	99	PCT	6	P2	BW1	.86			VS3	TEH	.610	NBAZC	3	H	
45	88	.36	80	PCT	7	P3	BW1	1.02			08H	VS3	.580	NPUFZ	59	H	
56	89	.40	83	MBM		6	02C	6.22			VS3	TEC	.610	ZBAZC	13	C	
48	91	.20	72	PCT	6	P2	09C	-1.37			VS3	TEC	.610	ZBAZC	6	C	
48	91	.60	79	PCT	12	P3	09C	-1.37			09C	09C	.580	NPUFZ	67	C	DQA
82	91	.17	58	PCT	7	P2	VS3	.62			VS3	TEH	.610	NBAZC	19	H	
82	91	.50	91	PCT	9	P3	VS3	.89			VS3	VS3	.580	NPUFZ	61	H	
136	91	.26	72	PCT	8	P2	VS1	-.10			VS3	TEH	.610	NBAZC	24	H	
136	91	.65	83	PCT	12	P3	VS1	-.31			VS1	VS1	.580	NPUFZ	61	H	DQA
143	98	.31	129	PCT	11	P2	VS1	.77			VS3	TEH	.610	NBAZC	23	H	
143	98	.76	83	PCT	14	P3	VS1	.62			VS1	VS1	.580	NPUFZ	61	H	
68	99	.74	74	PCT	19	P2	VS3	-.82			VS3	TEC	.610	ZBAZC	12	C	
68	99	1.52	92	PCT	24	P3	VS3	-.79		.41	VS3	VS3	.580	NPUFZ	61	H	DQA
47	100	.64	85	MBM		6	07H	9.46			VS3	TEH	.610	NBAZC	3	H	
171	100	.22	88	PCT	7	P2	02C	.00			VS3	TEC	.610	ZBAZC	44	C	
171	100	.59	113	PCT	11	P3	02C	.00			02C	02C	.600	ZPAHZ	65	C	
48	103	.35	84	PCT	11	P2	VS3	-.75			VS3	TEC	.610	ZBAZC	1	C	
48	103	.69	101	PCT	18	P2	09C	-1.60			VS3	TEC	.610	ZBAZC	1	C	
48	103	.73	104	PCT	13	P3	VS3	-.98			VS3	VS3	.580	NPUFZ	61	H	
48	103	1.04	70	PCT	19	P3	09C	-1.60		.41	09C	09C	.580	NPUFZ	67	C	DQA
169	104	2.43	179	DNT		P1	11H	-1.29			VS3	TEH	.610	NBAZC	23	H	
48	105	.46	109	PCT	12	P2	VS3	.65			VS3	TEC	.610	ZBAZC	2	C	
48	105	.43	134	PCT	12	P2	BW2	.75			VS3	TEC	.610	ZBAZC	2	C	
48	105	.50	110	PCT	14	P2	BW1	-.97			VS3	TEH	.610	NBAZC	3	H	
48	105	.86	115	PCT	15	P3	BW1	-1.01		.22	09H	VS3	.580	NPUFZ	61	H	
48	105	.61	91	PCT	11	P3	VS3	.76			09H	VS3	.580	NPUFZ	61	H	
48	105	.52	94	PCT	10	P3	VS3	.84			09H	VS3	.580	NPUFZ	61	H	
48	105	.63	80	PCT	13	P3	BW2	.75			09C	VS3	.580	NPUFZ	67	C	DQA
47	106	.65	113	PCT	18	P2	BW2	-.97			VS3	TEC	.610	ZBAZC	1	C	
47	106	.18	103	PCT	7	P2	BW1	.79			VS3	TEH	.610	NBAZC	4	H	
47	106	.57	96	PCT	11	P3	BW1	.83			08H	VS3	.580	NPUFZ	61	H	DQA
47	106	.73	97	PCT	13	P3	VS3	-.18			08H	VS3	.580	NPUFZ	61	H	DQA
47	106	.81	70	PCT	16	P3	BW2	-.97		.19	08C	VS3	.580	NPUFZ	67	C	DQA
51	108	.19	165	PCT	6	P2	VS3	.54			VS3	TEC	.610	ZBAZC	2	C	
48	109	.42	113	PCT	12	P2	VS3	.59			VS3	TEC	.610	ZBAZC	2	C	
48	109	.61	96	PCT	16	P2	09C	-1.58			VS3	TEC	.610	ZBAZC	2	C	
48	109	.38	117	PCT	11	P2	BW1	-.94			VS3	TEH	.610	NBAZC	3	H	
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
48	109	.51	125	PCT	10	P3	BW1	-.98			09H	VS3	.580	NPUFZ	61	H	DQA
48	109	.67	94	PCT	12	P3	VS3	.84			09H	VS3	.580	NPUFZ	61	H	DQA
48	109	.61	60	PCT	12	P3	09C	-1.58			09C	09C	.580	NPUFZ	67	C	DQA
47	110	.17	60	PCT	6	P2	BW2	1.04			VS3	TEC	.610	ZBAZC	1	C	
47	110	.28	102	PCT	11	P2	BW1	-.87			VS3	TEH	.610	NBAZC	4	H	
47	110	.86	108	PCT	15	P3	BW1	-.89		.30	08H	VS3	.580	NPUFZ	61	H	DQA
48	111	.29	96	PCT	9	P2	09C	-1.57			VS3	TEC	.610	ZBAZC	1	C	
48	111	.52	67	PCT	11	P3	09C	-1.55			09C	09C	.580	NPUFZ	67	C	DQA
48	113	.25	71	PCT	7	P2	09C	-1.52			VS3	TEC	.610	ZBAZC	2	C	
48	113	.51	59	PCT	11	P3	09C	-1.52			09C	09C	.580	NPUFZ	67	C	DQA
59	116	.75	108	PCT	22	P2	VS3	.89			VS3	TEH	.610	NBAZC	19	H	
59	116	1.18	96	PCT	20	P3	VS3	.96		.41	VS3	VS3	.580	NPUFZ	61	H	
48	117	.22	59	PCT	7	P2	09C	-1.58			VS3	TEC	.610	ZBAZC	2	C	
49	118	.25	154	PCT	8	P2	09C	-1.55			VS3	TEC	.610	ZBAZC	1	C	
90	119	.16	102	PCT	6	P2	10H	-1.42			VS3	TEH	.610	NBAZC	21	H	
90	119	.37	84	PCT	7	P3	10H	-1.39			10H	10H	.580	NPUFZ	61	H	DQA
39	120	.42	120	PCT	12	P2	BW2	-.90			VS3	TEC	.610	ZBAZC	2	C	
39	120	.58	84	PCT	12	P3	BW2	-.75			08C	VS3	.580	NPUFZ	66	C	DQA
40	121	.26	115	PCT	7	P2	BW2	-.76			VS3	TEC	.610	ZBAZC	2	C	
40	121	.43	93	PCT	9	P3	BW2	-.87			08C	VS3	.580	NPUFZ	66	C	
34	123	.32	94	PCT	10	P2	BW2	-.99			VS3	TEC	.610	ZBAZC	1	C	
34	123	.81	61	PCT	15	P3	BW2	-.97		.19	08C	VS3	.580	NPUFZ	66	C	DQA
48	123	.18	60	PCT	6	P2	09C	-1.68			VS3	TEC	.610	ZBAZC	1	C	
48	123	.52	73	PCT	10	P3	09C	-1.57			09C	09C	.580	NPUFZ	66	C	DQA
35	124	.23	50	PCT	9	P2	BW1	-.89			VS3	TEH	.610	NBAZC	4	H	
35	124	.82	113	PCT	14	P3	BW1	-.89			08H	VS3	.580	NPUFZ	61	H	DQA
124	127	.21	30	PCT	6	P2	BW2	-.79			VS3	TEC	.610	ZBAZC	49	C	
31	134	.83	74	MBM		6	08C	9.50			VS3	TEC	.610	ZBAZC	6	C	
104	135	.25	93	PCT	9	P2	VS2	.70			VS3	TEH	.610	NBAZC	14	H	
104	135	.93	95	PCT	15	P3	VS2	.70		.23	VS2	VS2	.580	NPUFZ	62	H	DQA
90	137	.27	97	PCT	9	P2	10H	.03			VS3	TEH	.610	NBAZC	13	H	
90	137	.60	88	PCT	10	P3	10H	.38			10H	10H	.580	NPUFZ	62	H	DQA
49	138	.55	65	MBM		6	05C	3.25			VS3	TEC	.610	ZBAZC	4	C	
39	144	.81	63	MBM		6	07H	21.88			VS3	TEH	.610	NBAZC	6	H	
141	144	.21	143	PCT	8	P2	VS3	-.65			VS3	TEH	.610	NBAZC	14	H	
141	144	.71	100	PCT	13	P3	VS3	-.75			VS3	VS3	.580	NPUFZ	61	H	DQA
115	148	.22	89	PCT	8	P2	VS3	-.74			VS3	TEH	.610	NBAZC	12	H	
115	148	.62	111	PCT	11	P3	VS3	-.74			VS3	VS3	.580	NPUFZ	62	H	DQA
27	150	.83	93	MBM		6	06C	12.30			VS3	TEC	.610	ZBAZC	24	C	
70	151	.16	123	PCT	6	P2	VS2	.78			VS3	TEH	.610	NBAZC	12	H	
70	151	.54	133	PCT	10	P3	VS2	.78			VS2	VS2	.580	NPUFZ	62	H	DQA
102	151	.24	103	PCT	9	P2	VS2	.80			VS3	TEH	.610	NBAZC	12	H	
102	151	.58	87	PCT	11	P3	VS2	.75			VS2	VS2	.580	NPUFZ	61	H	DQA
132	153	.32	134	PCT	10	P2	11H	-1.69			VS3	TEH	.610	NBAZC	11	H	
132	153	.57	81	PCT	11	P3	11H	-1.50			11H	11H	.580	NPUFZ	61	H	DQA
56	157	.34	54	MBM		6	05H	12.12			VS3	TEH	.610	NBAZC	11	H	

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
62	159	.66	83	MBM		6	02C	25.49			VS3	TEC	.610	ZBAZC	30	C	
41	160	.67	69	MBM		6	01C	5.24			VS3	TEC	.610	ZBAZC	23	C	
41	162	.68	67	MBM		6	07H	16.87			VS3	TEH	.610	NBAZC	9	H	
26	163	.97	91	MBM		6	08C	2.23			VS3	TEC	.610	ZBAZC	24	C	
26	165	.76	74	MBM		6	02C	10.58			VS3	TEC	.610	ZBAZC	23	C	
132	165	.60	71	PCT	16	P2	11H	.84			VS3	TEH	.610	NBAZC	9	H	
132	165	.99	90	PCT	16	P3	11H	.84		.23	11H	11H	.580	NPUFZ	62	H	DQA
49	166	.75	84	MBM		6	06H	5.35			VS3	TEH	.610	NBAZC	9	H	
56	167	.71	85	MBM		6	03C	16.54			VS3	TEC	.610	ZBAZC	24	C	
90	167	.35	143	NQI		P1	06H	31.34			VS3	TEH	.610	NBAZC	10	H	
38	169	2.32	178	DNT		P1	VS3	-.74			VS3	TEH	.610	NBAZC	9	H	
38	171	2.53	179	DNT		P1	VS3	-.91			VS3	TEH	.610	NBAZC	8	H	
38	171	2.94	178	DNT		P1	VS3	-.84			VS3	TEC	.610	ZBAZC	24	C	
38	179	2.04	181	DNT		P1	VS3	-.50			VS3	TEC	.610	ZBAZC	26	C	
87	180	.30	94	PCT	11	P2	BW1	.90			VS3	TEH	.610	NBAZC	8	H	
87	180	.65	106	PCT	11	P3	BW1	.90			09H	VS2	.580	NPUFZ	62	H	DQA
45	186	.57	68	MBM		6	05H	2.82			VS3	TEH	.610	NBAZC	5	H	
92	187	5.16	182	DNT		P1	09H	30.09			VS3	TEH	.610	NBAZC	6	H	
42	189	.77	65	MBM		6	06C	11.83			VS3	TEC	.610	ZBAZC	25	C	
82	189	1.00	62	MBM		6	06H	20.66			VS3	TEH	.610	NBAZC	5	H	
41	190	.32	159	NQI		3	03C	19.86			VS3	TEC	.610	ZBAZC	26	C	
41	190	.26	156	NQI		3	03C	20.86			VS3	TEC	.610	ZBAZC	26	C	
43	192	.39	77	MBM		6	FDP	28.21			VS3	TEC	.610	ZBAZC	25	C	
43	192	.19	119	MBM		2	FDP	28.21			FDP	01C	.600	ZPAHZ	65	C	
37	194	2.66	180	DNT		P1	VS3	.45			VS3	TEH	.610	NBAZC	5	H	
55	194	1.32	70	MBM		6	06H	7.76			VS3	TEH	.610	NBAZC	6	H	
24	197	.12	96	NQI		3	03C	18.65			VS3	TEC	.610	ZBAZC	25	C	
12	203	2.29	177	DNT		P1	TSC	11.46			VS3	TEC	.610	ZBAZC	58	C	
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM

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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	COM
32	3	3.32	178	DNT		P1	VS3	.67			VS3	TEC	.610	ZBAZC	8	C	
32	3	2.08	176	DNT		P1	VS3	.94			VS3	TEC	.610	ZBAZC	8	C	
50	5	6.60	180	DNT		P1	08C	8.78			VS3	TEC	.610	ZBAZC	10	C	
50	5	5.66	180	DNT		P1	08C	11.10			VS3	TEC	.610	ZBAZC	10	C	
50	5	2.76	181	DNT		P1	FDP	22.66			VS3	TEC	.610	ZBAZC	10	C	
51	22	.34	40	PCT	9	P2	VS3	.67			VS3	TEC	.610	ZBAZC	11	C	
51	22	2.28	180	DNT		P1	08C	13.09			VS3	TEC	.610	ZBAZC	11	C	
32	25	4.52	178	DNT		P1	VS3	-1.01			VS3	TEC	.610	ZBAZC	9	C	
32	25	3.36	179	DNT		P1	VS3	-1.02			VS3	TEH	.610	NBAZC	44	H	
57	26	4.11	179	DNT		P1	07H	2.81			VS3	TEH	.610	ZBAZC	31	H	
56	27	6.08	181	DNT		P1	03H	1.80			VS3	TEH	.610	ZBAZC	31	H	
90	31	2.68	176	DNT		P1	BW2	5.60			VS3	TEC	.610	ZBAZC	14	C	
51	32	.23	100	PCT	6	P2	VS3	.60			VS3	TEC	.610	ZBAZC	11	C	
123	38	2.13	176	DNT		P1	VS1	2.00			VS3	TEH	.610	ZBAZC	31	H	
32	43	.25	140	PCT	8	P2	VS3	-.72			VS3	TEH	.610	NBAZC	43	H	
133	46	5.02	178	DNT		P1	VS4	24.28			VS3	TEC	.610	ZBAZC	16	C	
130	49	.39	105	PCT	10	P2	VS3	-.74			VS3	TEC	.610	ZBAZC	15	C	
130	49	.37	137	PCT	15	P2	VS1	-.78			VS3	TEH	.610	ZBAZC	34	H	
130	49	.90	88	PCT	17	P3	VS1	-.79		.32	VS1	VS1	.580	NPUFZ	65	H	
130	49	.89	81	PCT	17	P3	VS3	-.89		.26	VS3	VS3	.580	NPUFZ	65	H	
29	50	.43	28	PCT	11	P2	VS3	.35			VS3	TEC	.610	ZBAZC	9	C	
137	50	.27	144	PCT	9	P2	VS1	-.90			VS3	TEH	.610	ZBAZC	33	H	
137	50	.57	64	PCT	12	P3	VS1	-.81			VS1	VS1	.580	NPUFZ	65	H	
115	54	.34	48	PCT	11	P2	VS2	-.97			VS3	TEH	.610	ZBAZC	35	H	
115	54	.87	76	PCT	17	P3	VS2	-.97		.56	VS2	VS2	.580	NPUFZ	65	H	
114	55	.28	62	PCT	9	P2	VS2	-.87			VS3	TEH	.610	ZBAZC	35	H	
114	55	.68	66	PCT	14	P3	VS2	-.95			VS2	VS2	.580	NPUFZ	65	H	
116	55	.29	83	PCT	9	P2	VS2	-.92			VS3	TEH	.610	ZBAZC	35	H	
116	55	.53	78	PCT	11	P3	VS2	-.80			VS2	VS2	.580	NPUFZ	65	H	
128	59	.16	23	PCT	5	P2	VS2	.76			VS3	TEH	.610	ZBAZC	35	H	
48	61	.36	107	PCT	9	P2	09C	-1.75			VS3	TEC	.610	ZBAZC	3	C	
48	61	.81	36	PCT	13	P3	09C	-1.79			09C	09C	.580	NPUFZ	65	C	
147	62	.66	116	PCT	15	P2	VS3	-1.09			VS3	TEC	.610	ZBAZC	18	C	
147	62	.39	122	PCT	10	P2	VS2	.70			VS3	TEH	.610	ZBAZC	36	H	
147	62	.60	76	PCT	12	P3	VS2	.41			VS2	VS2	.580	NPUFZ	65	H	
147	62	.92	76	PCT	18	P3	VS3	-1.05		.31	VS3	VS3	.580	NPUFZ	65	H	
47	66	.31	135	PCT	8	P2	VS3	-.65			VS3	TEC	.610	ZBAZC	4	C	
77	68	.21	141	PCT	7	P2	VS2	.69			VS3	TEH	.610	ZBAZC	25	H	
41	70	.16	135	NOI		3	BW1	11.32			VS3	TEH	.610	NBAZC	2	H	
6	71	1.18	9	NOI		P1	TSH	10.53			VS3	TEH	.610	NBAZC	52	H	
140	71	.78	91	PCT	21	P2	VS2	-.99			VS3	TEH	.610	NBAZC	37	H	
140	71	1.20	74	PCT	22	P3	VS2	-.96		.31	VS2	VS2	.580	NPUFZ	65	H	
71	72	.22	115	PCT	7	P2	VS2	.77			VS3	TEH	.610	ZBAZC	25	H	
116	73	2.77	176	DNT		P1	08C	10.55			VS3	TEC	.610	NBAZC	23	C	
71	76	.24	111	PCT	8	P2	VS2	.94			VS3	TEH	.610	ZBAZC	25	H	
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
137	76	.27	152	PCT	9	P2	VS3	-.72			VS3	TEH	.610	NBAZC	37	H	
137	76	.38	79	PCT	8	P3	VS3	-1.03			VS3	VS3	.580	NPUFZ	65	H	
47	82	.42	87	PCT	12	P2	BW1	-.98			VS3	TEH	.610	NBAZC	4	H	
47	82	.44	84	PCT	9	P3	BW1	-1.00			08H	VS3	.580	NPUFZ	65	H	
157	82	4.54	245	DEP		8	09H	34.65			VS3	TEH	.610	NBAZC	38	H	
163	82	4.40	246	DEP		8	09H	34.32			VS3	TEH	.610	NBAZC	38	H	
165	82	7.18	247	DEP		8	09H	34.67			VS3	TEH	.610	NBAZC	38	H	
132	85	.13	137	PCT	4	P2	11H	-.26			VS3	TEH	.610	NBAZC	38	H	
47	86	.36	131	PCT	9	P2	BW2	.80			VS3	TEC	.610	ZBAZC	4	C	
47	86	.82	121	PCT	13	P3	BW2	.78			08C	VS3	.580	NPUFZ	65	C	
57	88	.28	64	PCT	9	P2	VS3	-1.04			VS3	TEH	.610	ZBAZC	27	H	
47	90	.91	109	PCT	19	P2	BW2	.93			VS3	TEC	.610	ZBAZC	4	C	
47	90	1.16	88	PCT	17	P3	BW2	.85		.19	08C	VS3	.580	NPUFZ	65	C	
49	92	.58	52	PCT	17	P2	BW1	.84			VS3	TEH	.610	NBAZC	3	H	
49	92	.85	87	PCT	16	P3	BW1	.99		.22	08H	VS3	.580	NPUFZ	65	H	
49	94	.31	107	PCT	9	P2	VS3	-.67			VS3	TEH	.610	NBAZC	4	H	
49	94	.35	123	PCT	9	P2	VS3	-.43			VS3	TEC	.610	ZBAZC	4	C	
49	94	.68	89	PCT	14	P3	VS3	-.70			VS3	VS3	.580	NPUFZ	65	H	
46	95	.58	61	PCT	15	P2	BW1	.96			VS3	TEH	.610	NBAZC	4	H	
46	95	.95	93	PCT	18	P3	BW1	.95		.34	08H	VS3	.580	NPUFZ	65	H	
48	95	.25	62	PCT	6	P2	09C	-1.65			VS3	TEC	.610	ZBAZC	4	C	
48	95	.59	55	PCT	10	P3	09C	-1.64			09C	09C	.580	NPUFZ	65	C	
47	96	.40	133	PCT	13	P2	VS3	-.82			VS3	TEH	.610	NBAZC	3	H	
47	96	.90	91	PCT	17	P3	VS3	-.71		.48	VS3	VS3	.580	NPUFZ	65	H	
47	98	1.16	95	PCT	22	P2	BW2	-1.05			VS3	TEC	.610	ZBAZC	2	C	
47	98	.25	98	PCT	7	P2	BW1	-.87			VS3	TEH	.610	NBAZC	4	H	
47	98	1.52	99	PCT	22	P3	BW2	-.93		.18	08C	VS3	.580	NPUFZ	65	C	
48	99	.77	118	PCT	17	P2	BW2	.95			VS3	TEC	.610	ZBAZC	2	C	
48	99	.45	141	PCT	11	P2	09C	-1.67			VS3	TEC	.610	ZBAZC	2	C	
48	99	.39	115	PCT	11	P2	VS3	.53			VS3	TEH	.610	NBAZC	4	H	
48	99	.47	128	PCT	8	P3	VS3	.67			09C	VS3	.580	NPUFZ	65	C	
48	99	.90	90	PCT	14	P3	BW2	.92			09C	VS3	.580	NPUFZ	65	C	
48	99	.92	47	PCT	14	P3	09C	-1.71			09C	VS3	.580	NPUFZ	65	C	
48	101	.30	141	PCT	8	P2	VS3	.55			VS3	TEC	.610	ZBAZC	1	C	
48	101	.19	71	PCT	6	P2	VS3	.55			VS3	TEH	.610	NBAZC	3	H	
50	101	.31	66	PCT	10	P2	VS3	.67			VS3	TEH	.610	NBAZC	3	H	
50	101	.74	56	PCT	15	P3	VS3	1.01		.46	VS3	VS3	.580	NPUFZ	65	H	
49	102	.47	79	PCT	13	P2	BW1	-1.01			VS3	TEH	.610	NBAZC	4	H	
49	102	.51	95	PCT	11	P3	BW1	-.90			09H	VS3	.580	NPUFZ	65	H	
51	102	1.01	75	PCT	23	P2	VS3	.58			VS3	TEH	.610	NBAZC	4	H	
51	102	1.44	92	PCT	25	P3	VS3	.89		.32	VS3	VS3	.580	NPUFZ	65	H	
101	102	.29	131	PCT	8	P2	VS2	-.69			VS3	TEH	.610	ZBAZC	24	H	
101	102	.53	87	PCT	11	P3	VS2	-.85			VS2	VS2	.580	NPUFZ	65	H	
48	103	.48	125	PCT	12	P2	09C	-1.66			VS3	TEC	.610	ZBAZC	2	C	
48	103	.42	135	PCT	12	P2	BW1	-.72			VS3	TEH	.610	NBAZC	4	H	
48	103	.45	123	PCT	12	P2	VS3	.57			VS3	TEH	.610	NBAZC	4	H	
48	103	.57	93	PCT	12	P3	BW1	-.81			BW1	VS3	.580	NPUFZ	65	H	
48	103	.77	80	PCT	15	P3	VS3	.89		.45	BW1	VS3	.580	NPUFZ	65	H	
48	103	.98	46	PCT	15	P3	09C	-.70		.76	09C	09C	.580	NPUFZ	65	C	
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
138	103	4.01	179	DNT		P1	10C	25.74			VS3	TEC	.610	NBAZC	27	C	
47	104	.56	77	PCT	16	P2	BW1	.87			VS3	TEH	.610	NBAZC	3	H	
47	104	1.01	93	PCT	19	P3	BW1	1.00		.49	08H	VS3	.580	NPUFZ	65	H	
51	104	.30	114	PCT	10	P2	BW1	.82			VS3	TEH	.610	NBAZC	3	H	
51	104	.52	88	PCT	11	P3	BW1	.94			09H	VS3	.580	NPUFZ	65	H	
48	105	.43	120	PCT	11	P2	09C	-1.39			VS3	TEC	.610	ZBAZC	1	C	
48	105	.74	60	PCT	12	P3	09C	-.40			09C	09C	.580	NPUFZ	65	C	
60	105	.23	87	PCT	7	P2	VS2	.86			VS3	TEH	.610	ZBAZC	22	H	
67	106	.40	100	PCT	11	P2	VS3	-.91			VS3	TEH	.610	ZBAZC	22	H	
77	106	.33	118	PCT	8	P2	VS3	-.83			VS3	TEC	.610	NBAZC	29	C	
48	107	1.16	90	PCT	22	P2	09C	-1.68			VS3	TEC	.610	ZBAZC	2	C	
48	107	1.45	129	PCT	21	P3	09C	-1.55		.22	09C	09C	.580	NPUFZ	65	C	
48	109	.39	110	PCT	10	P2	09C	-1.43			VS3	TEC	.610	ZBAZC	1	C	
48	109	.72	51	PCT	12	P3	09C	-.65			09C	09C	.580	NPUFZ	65	C	
113	110	9.35	177	DNT		P1	10C	23.58			VS3	TEC	.610	NBAZC	29	C	
48	113	.39	140	PCT	10	P2	BW2	-.76			VS3	TEC	.610	ZBAZC	1	C	
48	113	.76	98	PCT	12	P3	BW2	-.74			09C	VS3	.580	NPUFZ	65	C	
48	115	.25	147	PCT	6	P2	09C	-1.61			VS3	TEC	.610	ZBAZC	1	C	
48	115	.86	38	PCT	14	P3	09C	-.76			09C	09C	.580	NPUFZ	65	C	
108	115	2.11	177	DNT		P1	BW1	22.31			VS3	TEH	.610	ZBAZC	22	H	
44	117	.33	101	PCT	8	P2	BW2	-.77			VS3	TEC	.610	ZBAZC	2	C	
44	117	.66	125	PCT	11	P3	BW2	-.77			08C	VS3	.580	NPUFZ	65	C	
45	120	.55	126	PCT	14	P2	VS3	-.74			VS3	TEH	.610	NBAZC	4	H	
45	120	.91	78	PCT	17	P3	VS3	-.54		.27	VS3	VS3	.580	NPUFZ	65	H	
54	123	.12	124	NOI		P1	TSH	14.53			VS3	TEH	.610	NBAZC	3	H	
93	140	2.89	177	DNT		P1	09C	21.91			VS3	TEC	.610	ZBAZC	36	C	
63	144	.22	83	PCT	6	P2	BW1	.83			VS3	TEH	.610	NBAZC	6	H	
134	163	2.60	181	DNT		P1	10H	9.52			VS3	TEH	.610	NBAZC	13	H	
134	163	3.86	180	DNT		P1	10H	10.24			VS3	TEH	.610	NBAZC	13	H	
134	163	3.20	180	DNT		P1	10H	17.67			VS3	TEH	.610	NBAZC	13	H	
134	165	.61	66	MBM		6	VS4	16.24			VS3	TEC	.610	ZBAZC	41	C	
27	168	5.33	176	DNT		P1	VS3	1.18			VS3	TEH	.610	NBAZC	19	H	
128	169	2.54	174	DNT		P1	TSH	6.75			VS3	TEH	.610	NBAZC	13	H	
128	169	.29	68	PCT	8	P2	VS3	-1.24			VS3	TEC	.610	ZBAZC	41	C	
125	170	.36	128	PCT	11	P2	VS3	.65			VS3	TEH	.610	NBAZC	15	H	
125	170	.59	85	PCT	12	P3	VS3	.53			VS3	VS3	.580	NPUFZ	65	H	
122	171	.24	152	PCT	8	P2	VS3	-.87			VS3	TEH	.610	NBAZC	15	H	
122	171	.62	90	PCT	12	P3	VS3	-.92			VS3	VS3	.580	NPUFZ	65	H	
122	173	.27	50	PCT	9	P2	VS3	.83			VS3	TEH	.610	NBAZC	15	H	
122	173	.37	119	PCT	9	P2	VS3	-1.16			VS3	TEC	.610	ZBAZC	41	C	
122	173	.70	99	PCT	14	P3	VS3	-1.08			VS3	VS3	.580	NPUFZ	65	H	
122	173	.45	76	PCT	9	P3	VS3	.83			VS3	VS3	.580	NPUFZ	65	H	
98	179	.30	111	PCT	9	P2	VS3	.59			VS3	TEH	.610	NBAZC	16	H	
98	179	.43	86	PCT	9	P3	VS3	.61			VS3	VS3	.580	NPUFZ	65	H	
27	184	4.02	182	DNT		P1	VS3	.51			VS3	TEH	.610	NBAZC	17	H	

ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
34	185	3.14	180	DNT		P1	VS3	-.60			VS3	TEH	.610	NBAZC	18	H	
54	187	.21	74	PCT	6	P2	BW1	-1.25			VS3	TEH	.610	NBAZC	18	H	
92	187	4.74	185	DNT		P1	10H	1.36			VS3	TEH	.610	NBAZC	17	H	
ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM

Tubes: 80 Records: 142

APPENDIX D

PLI & PLP

DATA SHEETS

SG-11 Reports

INSPDATE	ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
	164	75	.61	127	PLP		5	10C	-2.33			10C	10C	.500	ZPAHZ	65	C	SR
2007/06/01	164	75	2.06	127	INR		8	09C	34.45			TEC	TEH	.610	ZBAZC	26	H	
2007/06/01	164	75	2.34	138	PLP		5	10C	-2.33			10C	10C	.560	ZPSHZ	87	C	SR
	165	76	.46	109	PLP		5	10C	-2.43			10C	10C	.600	ZPAHZ	65	C	SR
2007/06/01	165	76	.04	83	PLP		6	09C	33.77			TEC	TEH	.610	ZBAZC	27	H	SR
2007/06/01	165	76	1.27	77	PLP		5	10C	-2.28			10C	10C	.560	ZPSHZ	87	C	SR
	3	192	.99	73	PLP		8	04H	-2.92			04H	04H	.600	ZPAHZ	57	H	SR
	3	192	.76	76	PLP		8	03H	33.36			03H	04H	.620	ZPAHZ	64	H	SR
2007/06/01	3	192			NDD							08C	TEC	.610	ZBA1C	60	C	
2007/06/01	3	192	.14	91	PLP		8	03H	33.30			08H	TEH	.610	ZBA1C	74	H	SR
2007/06/01	3	192			NDD							08C	08H	.540	ZPUPH	81	C	
2007/06/01	3	192	.98	75	PLP		8	03H	33.42			03H	04H	.560	ZPSHZ	83	H	SR
INSPDATE	ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM

Tubes: 3 Records: 12

SG-12 Reports

INSPDATE	ROW	COL	VOLTS	DEG	IND	PER	CHN	LOCN	INCH1	INCH2	CRLEN	BEGT	ENDT	PDIA	PTYPE	CAL	L	COM
	105	104	.34	54	PLP		8	08H	2.65			08H	08H	.600	ZPAHZ	64	H	SR
2007/06/01	105	104			NDD							TEC	TEH	.610	ZBAZC	56	H	
	108	105	.15	72	PLP		8	08H	1.75			08H	08H	.600	ZPAHZ	66	H	SR
2007/06/01	108	105			NDD							TEC	TEH	.610	ZBAZC	59	H	

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

Tubes: 2 Records: 4

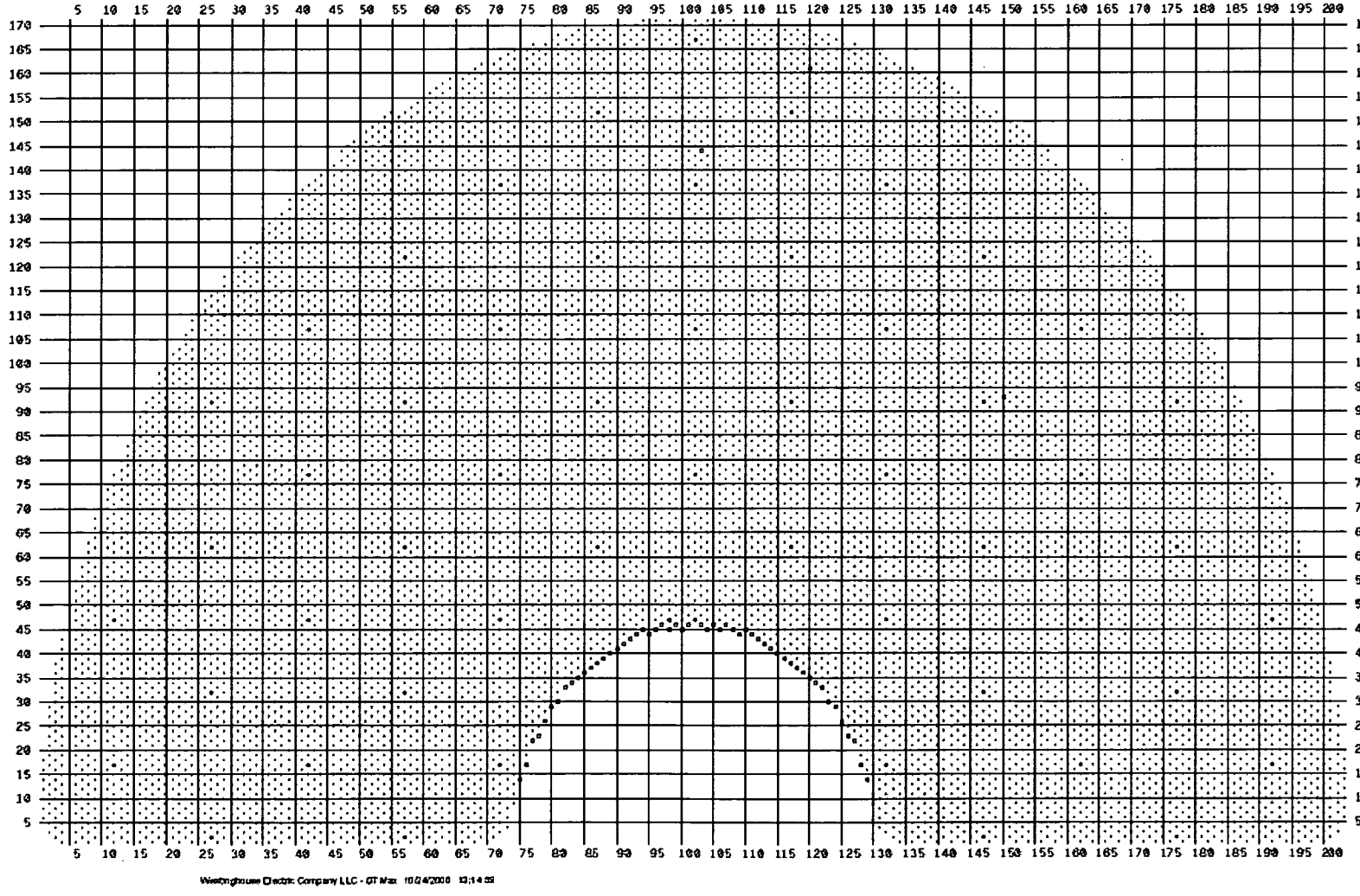
APPENDIX E

PLUG MAPS

SG - 12 Tubes Plugged in U1R14

Palo Verde U1R14 PVNGS1 1RSG

- 1 TBP
- 53 Stay Rod
- 57 Plugged Tube



Westinghouse Electric Company LLC - GT Max 10/24/2000 13:14:55

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	October 2008
8. INSPECTION INTERVAL	7-19-98 to 7-18-08 (to 7-18-09 with extension)

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.

No defective tubes were observed during these examinations. 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 tube identified below was plugged as a result of this examination.

The number of tubes plugged are as follows: SG 11 = 0 tubes

SG 12 = 1 tube **(Row 47 Line 98)**

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 3-29-09 SIGNED: ARIZONA PUBLIC SERVICE COMPANY 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 OF PROVINCE OF ARIZONA EMPLOYED BY HSB CT OF HARTFORD, CONNECTICUT HAVE INSPECTED THE COMPONENTS DESCRIBED IN THIS OWNERS REPORT DURING THE PERIOD 10-1-08 TO 3-31-09, 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 _____ COMMISSIONS NB 9685 Az 264 "A.N.I.C"
NATL' BOARD, STATE, PROVINCE

DATE 3-31-09

10 CFR 54.17

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

Dwight C. Mims
Vice President
Regulatory Affairs and Plant Improvement

Tel. 623-393-5403
Fax 623-393-6077

Mail Station 7605
P. O. Box 52034
Phoenix, Arizona 85072-2034

102-06005-DCM/GAM
May 08, 2009

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528, 50-529, and 50-530
Errata to Supplement 1 to License Renewal Application

By letter no. 102-05989, dated April 14, 2009, Arizona Public Service Company (APS) submitted Supplement 1 to the license renewal application (LRA) for PVNGS Units 1, 2, and 3. Supplement 1 to PVNGS LRA provided valve fatigue analysis information in response to NRC letter to APS dated February 13, 2009, and also included changes to reflect completed commitments, make minor corrections and enhancements, and clarify information previously provided.

In Supplement 1, additional references were added to the Environmental Report. This caused repagination of the reference pages with information rolling onto page 4-35. However, page 4-35 was not provided in the April 14, 2009, submittal. In addition, footnotes 3 and 4 on Supplement 1 page 4.3-54 contained editorial errors. This letter transmits an errata to Supplement 1 to the PVNGS LRA to provide the corrected pages 4.3-54 and 4-35 (Environmental Report).

In addition, Supplement 1 identified that one element of Commitment No. 14 (Table A4-1) was completed, but the procedure change implementation was delayed and not implemented until April 26, 2009. This has been entered into the PVNGS corrective action program as Palo Verde Action Request (PVAR) 3318172.

No commitments are being made to the NRC by this letter. Should you have questions regarding this submittal or if additional information is needed, please contact Angela K. Krainik, License Renewal Department Leader, at 623-393-5045.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 5/8/09
(Date)

Sincerely,

D. C. Mauro

DCM/SAB/GAM/gat

Enclosure: Replacement Pages and Insertion Instructions, Errata to Supplement 1 to License Renewal Application, Palo Verde Nuclear Generating Station Units 1, 2, and 3

cc:

E. E. Collins Jr.	NRC Region IV Regional Administrator
J. R. Hall	NRC NRR Project Manager
R. I. Treadway	NRC Senior Resident Inspector
B. E. Holian	NRC License Renewal Director
J. G. Rowley	NRC License Renewal Project Manager
L. M. Regner	NRC License Renewal Environmental Project Manager
A. V. Godwin	Arizona Radiation Regulatory Agency (ARRA)
T. Morales	Arizona Radiation Regulatory Agency (ARRA)

Enclosure

Replacement Pages and Insertion Instructions, Errata to Supplement 1 to License Renewal Application, Palo Verde Nuclear Generating Station Units 1, 2, and 3

Insertion Instructions
Errata to Supplement 1 to License Renewal Application,
Palo Verde Nuclear Generating Station Units 1, 2, and 3

Remove page:	Insert page:
4.3-54/4.3-55	4.3-54/4.3-55

Appendix E
Environmental Report

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4-35/blank	4-35/blank

Table 4.3-9- Summary of PVNGS Class 1 Valve Fatigue Analyses

Valve, Specification, and Analysis Descriptions	Calculated Design Basis Ops N_A for NB-3545.3 Normal Duty[1]	Maximum Design Basis CUF I_t for NB-3550 Cyclic Loads[1]
3JCHAHV0205 and 3JCHBHV0203 Valcor Model V526-5631-9, 2" Isolation Valves between the Unit 3 Regenerative Heat Exchanger and Auxiliary Spray Line A fatigue analysis of the crotch of the body used Subparagraph NB-3545.3 for the section in thermal cycles when the temperature change rate is 100 °F/hr. Pipe and seismic load stresses are treated as cyclic loads in the fatigue analysis.	10,000	0.151 (Crotch)
1/2/3JRCEPSV0200/201/202/203 Dresser Model 6-31709NAX-1-XNC045 Pressurizer Pressure Safety Valves (6" Inlet)	> 10^6	< 0.002[5]
1/2/3JCHEPDV0240 FisherModel 667-DBQ/ 50B0617/ 54A6460, 2" Isolation Valves for the Charging Line This analysis used Subparagraph NB-3545.3, "Fatigue Requirements," 1983	6,000	0.7656 (Valve Body)
1,2,3JSIBPSV0169 and 1,2,3JSIAPSV0469 Crosby Model JMAK-3/4X1, ¾" Safety Injection Line Thermal Relief Valves The analysis confirms that these valves will withstand the specified number of each of three thermal transients from the valve specification as reported in UFSAR 5.2.2.4.4.2.	> 2,000	0.075 (Valve Body Inlet)[6]

[1] N_A and I_t were calculated for the design basis number of loading events applicable to the component that were originally intended to encompass a 40-year design life.

[2] The fatigue evaluations of the valve components are performed in accordance with ASME Code, Section III, Subparagraph NB-3222.4, hence a calculated NA for NB-3545.3 normal duty operations is not applicable.

[3] "Crotch" is the region in the valve between the body and the neck, a stress concentration region and a required analysis location under ASME III, Subarticle NB-3500 design rules for Class 1 valves, Subparagraph NB-3545.1.

[4] A range of 40-year CUFs has been calculated. The higher value was arrived at by conservative interpretation of the Code for combination of cycles that exceed 100 °F/hr, whereas the lower value uses the actual 116 °F/hr rate.

[5] The CUF is not explicitly calculated in the Design Report, but the CUF presented here is derived from the statement in the Design Report that the allowable number of cycles from the ASME Code analysis is greater than 10^6, compared to the specification allowable value of 2,000 cycles (CUF = 2,000/>10^6 < 0.002).

[6] Highest CUF calculated for the three analyzed locations; the inlet nozzle, valve inlet and valve outlet.

For the valves modeled with an NB-3545.3 normal duty operating cycle evaluation, the allowed NB-3545.3 N_A normal duty operations is much greater than the required minimum of 2000 cycles. The calculated cumulative usage factors I_t for NB-3550 cyclic loads are less than the code limit of 1.0.

Effect of Combustion Engineering Infobulletin 88-09 "Nonconservative Calculation of Cumulative Fatigue Usage"

The CE Owner's Group review of Combustion Engineering Infobulletin 88-09 did not identify any effects on the fatigue analyses of Class 1 valves.

Disposition: Validation, 10 CFR 54.21(c)(1)(i); and Aging Management, 10 CFR 54.21(c)(1)(iii)

Validation - Valves with large margin

The calculated worst-case usage factors for the 16" Shutdown Cooling Suction Containment Isolation Valves, the 14" Safety Injection Tank Injection Discharge Isolation Gate Valves, the 14" Safety Injection Tank Injection Discharge Check Valves, the 12" HPSI/LPSI check valves, the ¾" Safety Injection Line Thermal Relief Valves, the pressurizer safety valves, and the 2" isolation valves for the auxiliary spray indicate that the designs have large margins, and therefore that the pressure boundaries would withstand fatigue effects for at least 1.5 times the original design lifetimes. The design of these valves for fatigue effects is therefore valid for the period of extended operation, in accordance with 10 CFR 54.21(c)(1)(i).

Aging Management - Shutdown Cooling Suction Isolation Valve, and Charging Line Isolation

The calculated worst-case usage factor in these valves is 0.7656. However, fatigue usage factors in these valves do not depend on effects that are time-dependent at steady-state conditions, but depend only on effects of operational, abnormal, and upset transient events. The Metal Fatigue of Reactor Coolant Pressure Boundary program will track events to ensure that appropriate reevaluation or other corrective action is initiated if an action limit is reached. Action limits will permit completion of corrective actions before the design basis number of events is exceeded. The charging line isolation valves are subject to similar but less-severe cyclic effects than the charging nozzles, whose fatigue usage is tracked by the stress-based method. The shutdown cooling suction isolation valve is the limiting location on the shutdown cooling line, and will be tracked by the cycle-based fatigue method. Effects of fatigue in Class 1 valve pressure boundaries will thereby be managed for the period of extended operation, in accordance with 10 CFR 54.21(c)(1)(iii).

The Metal Fatigue of Reactor Coolant Pressure Boundary program is described in Section 4.3.1; and is summarized in Appendix B, Section B3.1. See Table 4.3-4 for details of the program, and Section 4.3.1.5 for a description of its action limits and corrective actions.

Section 4.13

IEEE (Institute of Electrical and Electronics Engineers) 1997. *National Electrical Safety Code*, 1997 Edition, New York, New York.

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Section 4.14

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Section 4.15

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Section 4.19

NRC (U.S. Nuclear Regulatory Commission) 1982. *Final Environmental Statement related to the operation of Palo Verde Nuclear Generating Station, Units 1, 2, and 3.* Docket Nos. STN 50-528, STN 50-529 and STN 50-530. NUREG-75/078. Arizona Public Service Company, et al. February.

NRC (U.S. Nuclear Regulatory Commission) 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), Volumes 1 and 2*, NUREG-1437. Washington, D.C. May.

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10 CFR 26.719(c)(1)

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

Dwight C. Mims
Vice President
Regulatory Affairs and Plant Improvement

Tel. 623-393-5403
Fax 623-393-6077

Mail Station 7605
P. O. Box 52034
Phoenix, Arizona 85072-2034

102-06006-DCM/KAC
May 11, 2009

Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN 50-528/529/530
Unanticipated Result for an FFD Blind Performance Test Sample

Pursuant to 10 CFR 26.719(c)(1), Arizona Public Service Company hereby provides, as an enclosure to this letter, a report of an unanticipated result for a Fitness for Duty (FFD) blind performance test sample.

On March 16, 2009, the PVNGS FFD collection facility received, from a Department of Health and Human Services (HHS) certified laboratory, an unanticipated blind performance test result that was not consistent with the expected result for a blind false negative challenge sample. The test result failed to meet the requirements contained in 10 CFR 26.168(g)(3) for blind performance testing.

Palo Verde completed its investigation on April 11, 2009, and determined that the failure was due to shipping and handling methods used by the commercial supplier of the blind sample. The failure was not associated with an HHS-certified laboratory. Results of the investigation are documented within the enclosure to this letter.

No commitments are being made to the NRC by this letter. Should you need further information regarding this submittal, please contact Ray E. Buzard, Compliance Section Leader, at (623) 393-5317.

Sincerely,

D. C. Mims

DCM/REB/KAC/gat

Enclosure

cc:	E. E. Collins Jr.	NRC Region IV Regional Administrator
	J. R. Hall	NRC NRR Project Manager
	R. I. Treadway	NRC Senior Resident Inspector for PVNGS

ENCLOSURE
Unanticipated Result for an FFD Blind Performance Test Sample

Description

In accordance with 10 CFR 26.168, the Palo Verde Fitness for Duty (FFD) Program submits blind performance test samples to a Department of Health and Human Services (HHS) certified laboratory for analysis. New requirements for 10 CFR Part 26 introduced an element that requires blind performance testing of false negative challenge samples. This requirement is specified in 10 CFR 26.168(g)(3). Palo Verde implemented the new requirements on February 27, 2009.

On March 13, 2009, the first blind performance test for a false negative challenge sample for Tetrahydrocannabinol (THC) was sent to an HHS-certified laboratory. On March 16, 2009, the Palo Verde FFD collection facility received an unanticipated result for the sample. FFD personnel expected a positive result for the false negative challenge sample. However, the laboratory reported a negative level of THC. Palo Verde requested a retest of the blind false negative challenge sample from the HHS-certified laboratory. This retest result also fell outside the acceptable range required by 10 CFR Part 26.168(g)(3).

This unanticipated blind performance test result represented an unsatisfactory condition that was investigated by Palo Verde. Pursuant to 10 CFR 26.719(c)(1), a report of the condition and corrective actions taken or planned is required within 30 days of completion of the investigation.

Investigation Results

Palo Verde contracts with a commercial supplier to provide FFD blind samples. The samples are shipped to the plant and then shipped from the plant to an HHS-certified laboratory for analysis. When the unanticipated negative test result was received, Palo Verde informed the commercial supplier of the result for the THC false negative blind sample. The supplier stated the concentration of THC in the sample could have deteriorated.

The investigation revealed that the concentration of THC used in blind performance test samples decreases over time. For blind samples prepared with a low level of THC the concentration may decrease below the acceptable range required by 10 CFR Part 26.168(g)(3). Based on information provided by the commercial supplier, a decrease of THC concentration is caused by adsorption of THC by the polypropylene sample container, as well as exposure to heat. The possibility of switching to glass was explored, but polypropylene was determined to be the best option. Therefore, the investigation focused on reducing heat exposure to THC blind false negative challenge samples.

Prior to this occurrence, the handling process used by the commercial supplier did not incorporate special packaging methods (i.e., cold packing) and samples were shipped to Palo Verde via two-day ground transportation.

The commercial supplier changed shipping and handling methods to minimize the impact from heat. The effectiveness of this change was verified by sending new THC false negative challenge samples directly to Palo Verde and to the HHS-certified laboratory. Palo Verde subsequently shipped its sample to the laboratory for comparative analysis.

The results for the sample sent directly to the HHS-certified laboratory and the sample sent from Palo Verde were within the range required by 10 CFR 26.168(g)(3). Palo Verde concluded that changes to shipping and handling methods by the commercial supplier would correct the condition.

Actions Taken

The commercial supplier changed the method that blind performance test samples are shipped. Samples are now packed with ice packs and foam prior to shipping to Palo Verde.

In addition, the commercial supplier now ships blind performance test samples to Palo Verde via overnight shipping instead of two-day ground transportation.

The commercial supplier decreased the shelf life for false negative blind performance test samples from 60 days to 30 days.

Palo Verde issued an operating experience notification to the industry on April 15, 2009.