



**Palo Verde
Nuclear Generating Station**
5801 S. Wintersburg Road
Tonopah, AZ 85354

102-007032-TNW/MDD/CJS
April 14, 2015

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 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 eighteenth refueling outage.

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

Should you have questions regarding this submittal, please contact Michael D. Dilorenzo, Licensing Section Leader, at (623) 393-3495.

Sincerely,

A handwritten signature in blue ink, appearing to read "Thomas N. Weber", is written over a horizontal line.

Thomas N. Weber
Nuclear Regulatory Affairs Department Leader
TNW/MDD/CJS/hsc

Attachment
cc: (with attachment)

M. L. Dapas	NRC Region IV Regional Administrator
M. M. Watford	NRC NRR Project Manager for PVNGS
C. A. Peabody	NRC Senior Resident Inspector for PVNGS

A001

Attachment

Unit 1 – 18th Refueling Outage Steam Generator Tube Inspection Report



Palo Verde Nuclear Generating Station

UNIT 1
U1R18

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

Prepared by: Douglas B Hansen

Date: 11-3-14

Reviewed by: _____

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Date: 2015.04.02 12:57:43 -0700

Date: _____

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Reason: System Engineering Department Leader
Date: 2015.04.03 09:54:15 -0700

Report Date: _____

Commercial Service Date: 1-28-86

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UNIT 1

STEAM GENERATOR EDDY CURRENT

U1 R18 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 18th refueling outage in Unit 1 (U1R18) was conducted during October 2014. Mode 4 entry of Unit 1 was entered on November 7, 2014. 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 fifth examination performed in Unit 1 following steam generator replacement in U1R12. This examination is not considered a 100% full length tubing inspection.

The examinations resulted in a total of 0 tubes being plugged in SG 11, and 0 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 bobbin examinations of the peripheral tubes.

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. 13 4-2010	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
<ul style="list-style-type: none"> Rev 1 added cautionary note, no change to site qualification. 								

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 primary data analysis. Areva provided the secondary data analysis.

Each individual from Westinghouse and Areva 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 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. No tubes were plugged this outage.

Appendix E contains a map that details 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

Initially, no inspections were planned for U1R18. Experience from recent PVNGS outages indicates that there is an increasing trend in the Steam Generators associated with foreign objects and foreign object wear. In the most recent outage in all 3 units, foreign object wear has been encountered (1R17, 3R17, and 2R18). Prior to these findings, there were only 2 other instances of FO wear since SG replacement. As a result, a conservative decision was made to perform a foreign object inspection in PVNGS Unit 1 during U1R18. The inspection verified that no foreign objects (or foreign object wear) exist in the high flow regions of the top of tubesheet (TTS) and Flow Distribution Plate areas in each SG. This area was defined as approximately the first 5 rows of the periphery in the hot leg TTS and cold leg TTS. Both primary (ECT) and secondary (FOSAR) inspections were performed in these areas. The extent of the bobbin testing was from tube end to 1st eggcrate. The specific inspection plan as well as the plugging criteria was documented in the U1R18 Degradation Assessment.

Tube Inspections

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 18. No tube pulls or insitu pressure testing were required based on the results of the examinations.

Foreign Object Search and Retrieval (FOSAR)

Tubesheet FOSAR Activities

Tubesheet FOSAR was conducted using a power cart mounted with a remotely operated camera, guide tubes, video probes and various retrieval tooling. The following areas were inspected:

- Hot and cold leg top of tubesheet annulus region. At least 5 tube rows into the bundle were viewed from the annulus.
- Hot and cold leg blowdown lanes. Approximately 5 rows deep into the tube bundle were viewed from the lane.

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 1 during U1R15. The condition was first identified in Unit 2 during U2R15. The inspections confirmed that the weld material in the vicinity of the cracked weld on all 4 patch plates (2 per SG) is intact, and a loose parts concern is not being created. A previous evaluation concluded that, with the presence of the cracked welds, the patch plates in the Unit 2 SGs will continue to perform their design function and that the probability of loose parts being formed is remote. This evaluation applies to the Unit 1 SGs as well since the design is the same. Thus, there is a very low risk that the cracked welds will affect the structural or leakage integrity of tubes in these steam generators.

SG11 Tubesheet FOSAR Results

No foreign objects were found during the inspections on the top of tubesheet in SG 11.

SG12 Tubesheet FOSAR Results

As a result of the inspections performed in SG 12, 5 items were logged as foreign objects. The inspection results were documented in PVAR 4586454. Of the 5 items logged, one foreign object was removed from the SG. Part 12-005 was found on the cold leg side in between tubes R1C6, R2C5 and R3C6 and was successfully retrieved. No wear was identified visually or by ECT in the area of these tubes. Part 12-005 is rod shaped and appears to be a dowel pin as shown in Figure 8-1. Of the 4 objects that were not retrieved from SG 11:

- Parts 12-001 and 12-002 appear to be non-metallic chips. Part 12-001 was identified lying next to tube R23C2 and in the annulus on the cold leg side and measured approximately 0.4 in X 0.2 in X 0.04 in (Figure 8-2). Part 12-002 was identified lying in the annulus near tube R170C115 on the cold leg side and measured approximately 0.35 in X 0.3 in X 0.2 in (Figure 8-3). Since these objects are likely non-metallic (ECT did not identify a part in the areas), the threat to tube integrity is considered very low. There was no wear associated with these tubes. 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. Per the PVNGS SG Program, trending of these locations will continue in future outages.
- Part 12-003 appears to be an extremely small sludge rock located in the cold leg annulus near tube R160C137. Part 12-003 measured approximately 0.15 in X 0.04 in X 0.15 in (Figure 8-4). There was no wear associated with these tubes. 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. Per the PVNGS SG Program, trending of these locations will continue in future outages.

- Part 12-004 was originally thought to be a sludge rock; however, Plus Point ECT testing did not identify an object in this location, indicating that the material may be graphite. Part 12-004 is located in between tubes R154C59 and R153C60 on the cold leg side. Part 12-004 measured approximately 0.25 in X 0.12 in X 0.12 in (Figure 8-5). Attempts to retrieve this item were unsuccessful. There was no wear associated with these tubes. 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. Per the PVNGS SG Program, trending of these locations will continue in future outages.

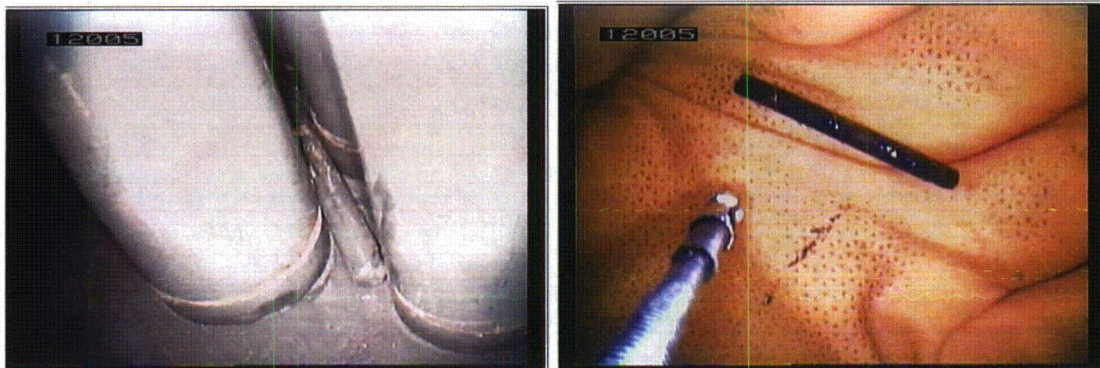


Figure 8-1 – Part 12-005 – Rod Shaped Object (Dowel Pin) Left: In Bundle; Right: After Retrieval



Figure 8-2 – Part 12-001 – Non-Metallic Chip



Figure 8-3 – Part 12-002 – Non-Metallic Chip



Figure 8-4 – Part 12-003 – Sludge Rock

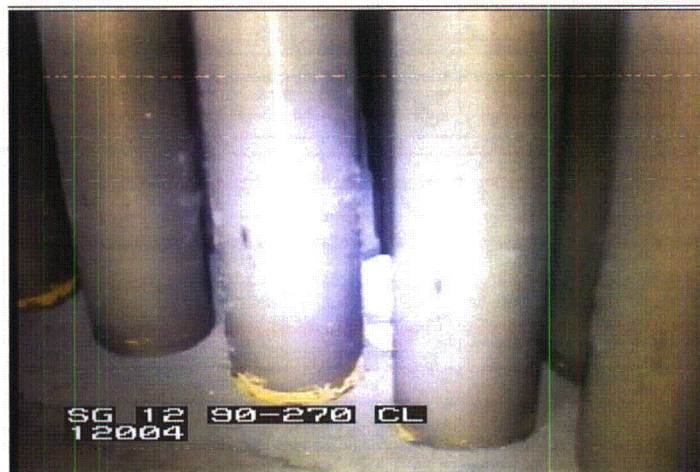


Figure 8-5 – Part 12-004 – Sludge Rock (possibly graphite material)

Flow Distribution Plate FOSAR Activities

Flow Distribution Plate (FDP) FOSAR was conducted using a series of guide tubes video probes and various retrieval tooling. The annulus region was inspected as well as looking in bundle approximately 5 tubes rows.

Note - Foreign material introduced via the feed-train is most often found on the cold leg top of tubesheet. There is a small gap (0.25 inches) in between the bottom of the feedwater box and the top

of the FDP where foreign objects could be introduced via FW onto the FDP, but this is considered a less likely flow path.

Foreign material could also enter the SG through the downcomer piping at the top of the SG. This is also a less likely flow path since only 10% of the feedflow is introduced via the downcomer piping. This downcomer feed flow is combined with the internal SG recirculation flow and is introduced into the tube bundle at the tube sheet on the hot leg side and through the Downcomer Window on the cold leg side. This window is between the 03C and 04C eggcrate support.

SG11 FDP FOSAR Results

As a result of the inspections performed on top of the FDP in SG 11, 1 item was logged as a foreign object. The inspection results were documented in PVAR 4586212. This was the only foreign object found in SG 11. The object was successfully retrieved from the SG. The object (Part ID 11-001) measures approximately 4 in X 0.128 in X 0.01 in and is metallic and could not be picked up by a magnet (Figure 8-6). The part's origin is unknown. It was located in between tubes R68C9, R66C9, R67C10, R65C10, R66C11, R65C12, and R63C12. No wear was detected on these tubes or in the area surrounding these tubes by bobbin or plus point ECT.

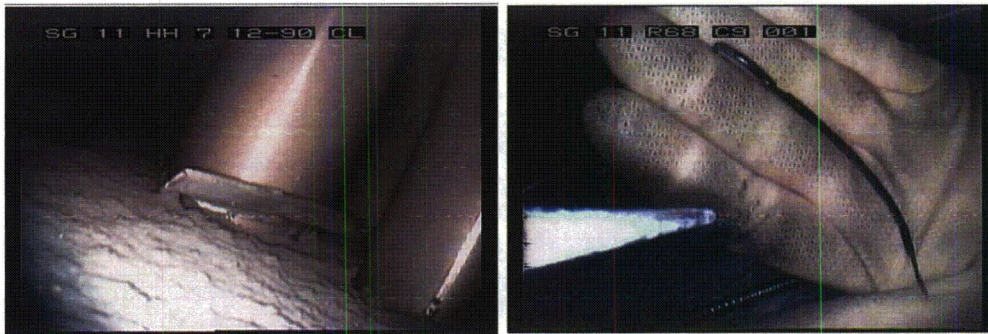


Figure 8-6 – Part 11-001 – Unknown Metallic Object - Left: In Bundle; Right: After Retrieval

SG12 FDP FOSAR Results

No foreign objects were found during the inspections on the FDP in SG 12.

Foreign Object Wear Discovered During UIR18

No foreign object wear was discovered in SG 11 or 12 during FOSAR inspection or during eddy current testing.

Potential Loose Parts

SG11

The only PLPs detected in SG 11 during ECT in U1R18 were historical PLP signals from 1R17 and are shown below. These tubes (and surrounding tubes) were tested with plus point with no indications of wear. It should be noted that these tubes are located near the stay cylinder area. FOSAR was not performed in this area because it is inaccessible due to the stay cylinder design. This area is not a high flow region.

Row	Col	Location
32	79	Hot Leg
33	80	Hot Leg
32	81	Hot Leg

SG12

There were no PLP calls in SG 12 detected during ECT in U1R18. The tubes surrounding R8C1, R10C1, and R9C2 were tested with plus point with no indications of wear.

Plug Integrity and NSAL 12-1 Inspection

No tube plug inspection was required during U1R18. The EPRI Steam Generator Examination Requirements state "Visual examination shall be performed on all installed plugs when the SG is opened for scheduled primary side examinations". The U1R18 inspection is not a scheduled examination, so there is no requirement to perform this inspection.

A channel head inspection was performed in response to Westinghouse Engineering Nuclear Safety Advisory Letter (NSAL) 12-1, dated January 5, 2012. The inspection was performed in accordance with APS Supplier Document Number 13-MN725-A02011. No discrepancies were found.

TABLE 1
EXAMINATION SUMMARY

SCOPE DESCRIPTION		SG 11	SG 12
Exam Description	Extents	Scope	Scope
COLD LEG BOBBIN	TEC-01C	2011	1994
HOT LEG BOBBIN	TEH-01H	1957	1940
COLD STRAIGHT & UBEND SECTION BOBBIN	na	na	na
HOT STRAIGHT SECTION BOBBIN	na	na	na
HOT STRAIGHT RC*	VARIOUS	18	30
HOT U & SQUARE BEND RC*	na	na	na
COLD STRAIGHT RC*	VARIOUS	47	77
COLD U & SQUARE BEND RC*	na	na	na

Notes: * RC-rotating coil examinations were performed to evaluated bobbin coil examination results

TABLE 2
INDICATION SUMMARY

DAMAGE MECHANISM	STEAM GENERATOR 11		STEAM GENERATOR 12	
	Tube	Indications	Tube	Indications
WEAR				
1% - 19%	7	9	0	0
20% - 29%	1	1	0	0
30% - 39%	0	0	0	0
≥ 40%	0	0	0	0
PLUGGED	(0)		(0)	
Possible Loose Parts (RC)				
PLI	0		0	
PLP	3		0	
PLUGGED	(0)	na	(0)	na
PREVENTATIVE	(0)	na	(0)	na
PLUGGED	(0)		(0)	
TOTAL PLUGGED / %	(88 / 0.7%)		(107 / 0.9%)	

NOTES

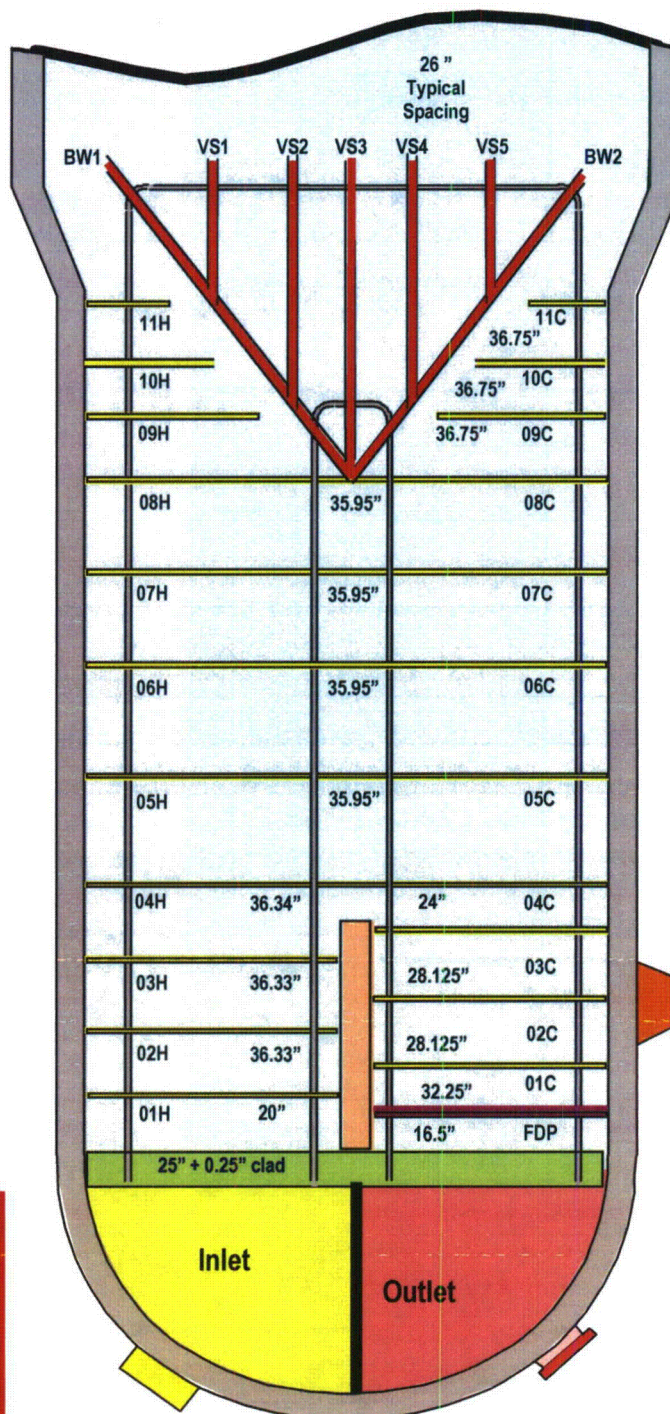
1. Numbers in (X) are tubes numbers plugged in each category
2. The "Tube" column above represents Bobbin Coil results for the number of tubes; using the largest wear indication
3. The "Indications" column above represents Bobbin Coil results for the number of wear indications

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 StrapVS1
	#1 BatwingBW1
	#1 Support Plate in Hot Leg.....01H
	#7 Support Plate in Cold Leg.....07C
	Top Tube Sheet Cold LegTSC
	Tube End Hot LegTEH
	Tube End Cold LegTEC
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
History Review.....	HR
ID Chatter.....	IDC
Indication Not Found	INF
Indication Not Reportable	INR
Multiple Axial Indication	MAI
Manufacturer Burnishing Mark	MBM
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.....	EXP
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 Volumetric Indication	SVI
Senior (Lead) Analysis Review	SR
Sludge.....	SLG
To Be Plugged.....	TBP
Volumetric Indication.....	VOL

Quality Codes:

Cross talk.....	QCT
Insufficient extent tested.....	QET
Sudden drift of signal base line	QDO
Less than the required samples.....	QDR
Quality issue for ADS or RTAA	QDS
System out of balance.....	QOS
Spiking or parasitic noise	QPN
One or more required channels without signal	QPS
Saturated signals in the tube	QSS
Probe speed varies.....	QSV
Historical indications not present	QPV
Tube number in question	QTI

APPENDIX B

STEAM GENERATOR 11

SUMMARY DATA SHEETS

SG - 11 Bobbin Percent Calls (1 - 100%)

Palo Verde 1 U1R18

PVNGS1 20141001

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ROW	COL	VOLTS	DEG	IND	PER	CRLEN	CHN	LOCN	INCH1	INCH2	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX	UTIL1	UTIL2
168	99	.26	122	PCT	8		P2	01C	.00		01C	TEC	.610	NBAZ1	5	C	180		
171	100	.31	73	PCT	10		P2	01C	.02		01C	TEC	.610	NBAZ1	6	C	182		
171	100	.31	73	PCT	10		P2	01C	.05		01C	TEC	.610	NBAZ1	6	C	182		
168	101	.78	74	PCT	20		P2	01C	.93		01C	TEC	.610	NBAZ1	6	C	180		
170	101	.39	100	PCT	12		P2	01C	.22		01C	TEC	.610	NBAZ1	6	C	181		
170	101	.61	107	PCT	16		P2	01C	.87		01C	TEC	.610	NBAZ1	6	C	181		
171	102	.33	106	PCT	12		P2	01C	.68		01C	TEC	.610	NBAZ1	5	C	177		
168	103	.32	91	PCT	12		P2	01C	.63		01C	TEC	.610	NBAZ1	5	C	175		
171	104	.34	100	PCT	10		P2	01C	.50		01C	TEC	.610	NBAZ1	6	C	176		
171	106	.25	93	PCT	10		P2	01C	.82		01C	TEC	.610	NBAZ1	5	C	171		
ROW	COL	VOLTS	DEG	IND	PER	CRLEN	CHN	LOCN	INCH1	INCH2	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX	UTIL1	UTIL2

APPENDIX C

STEAM GENERATOR 12

SUMMARY DATA SHEETS

(NONE IN SG 12)

APPENDIX D

PLI & PLP

DATA SHEETS

(NONE IN SG 12)

SG - 11 +PT PLP Calls

Palo Verde 1 U1R18

PVNGS1 20141001

10/21/2014 16:07:55

ROW	COL	VOLTS	DEG	IND	PER	CRLEN	CHN	LOCN	INCH1	INCH2	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX	UTIL1	UTIL2
32	79	1.83	82	PLP			8	TSH	.35		TSH	TSH	.600	NPSHZ	12	H	12	HR	
33	80	.40	98	PLP			8	TSH	.78		TSH	TSH	.600	NPSHZ	12	H	7	HR	
32	81	1.68	85	PLP			8	TSH	1.46		TSH	TSH	.600	NPSHZ	12	H	6	HR	
ROW	COL	VOLTS	DEG	IND	PER	CRLEN	CHN	LOCN	INCH1	INCH2	BEGT	ENDT	PDIA	PTYPE	CAL	L	IDX	UTIL1	UTIL2

APPENDIX E

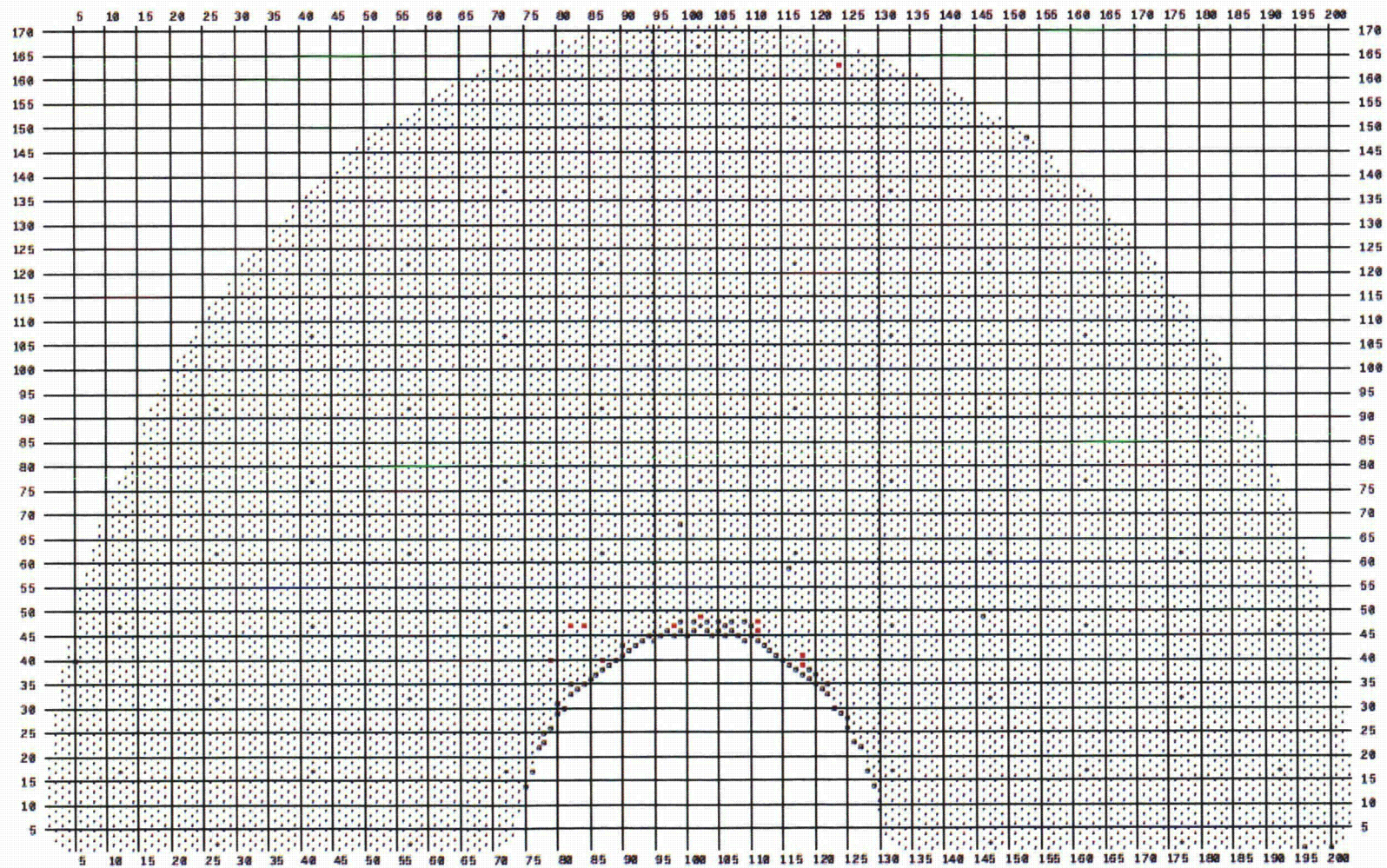
PLUG MAPS

(SAME AS U1R17)

SG - 11 Tubes Plugged in U1R17

Palo Verde U1R17 PWNGS1 1RSG

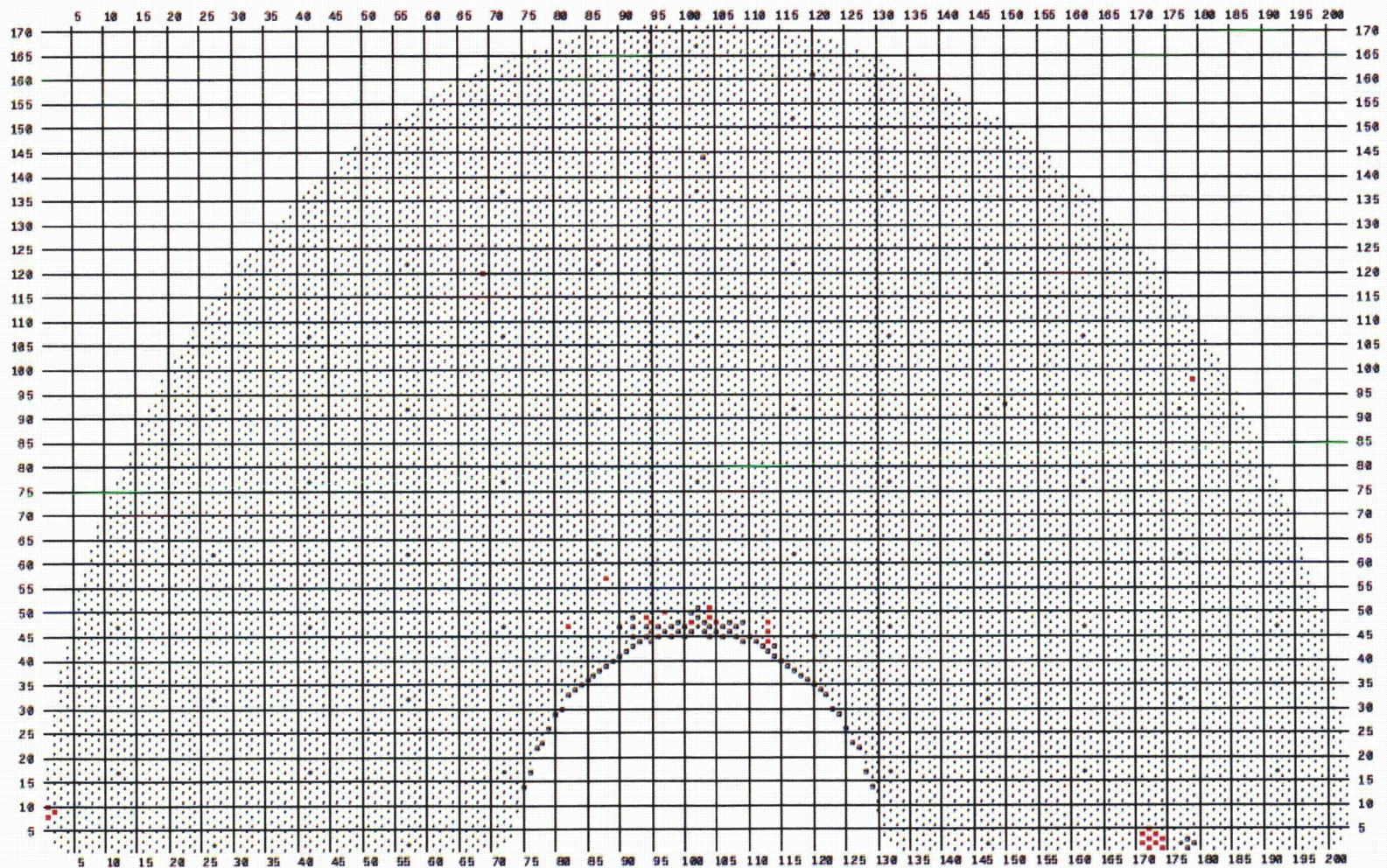
- 11 Tubes Plugged in U1R17
- 53 Stay Rod
- 77 Plugged Tube



SG - 12 Tubes to Plug in U1R17

Palo Verde U1R17 PVNGS1 1RSG

- 27 Tubes Plugged in U1R17
- 53 Stay Rod
- 80 Plugged Tube



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

Ansaldo

224

NA

173

STEAM
GENERATOR 11

1MRCEE01B

Ansaldo

225

NA

174

STEAM
GENERATOR 12

APS

NIS - 1 BACK

OWNERS' DATA REPORT FOR INSERVICE INSPECTIONS

7. EXAM DATES

October 2014

8. INSPECTION INTERVAL

7-18-08 to 7-17-18

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. No tubes were plugged as a result of this examination.

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 **Hansen, Douglas**
Digitally signed by Hansen, Douglas B(Z41530)
DN: cn=Hansen, Douglas B(Z41530)
Date: 2015.03.31 09:05:41 -0700'

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 October 2014 TO March 2015, 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.

Hogstrom,
INSPECTOR **Robert (YH2450)**
Digitally signed by Hogstrom, Robert (YH2450)
DN: cn=Hogstrom, Robert (YH2450)
Reason: HSB GS Inspector
Date: 2015.04.01 14:18:27 -0700'

COMMISSIONS N.B. 9685 "A,N,I,C", Az 264
NATL' BOARD, STATE, PROVINCE

DATE _____