American Electric Power

Mitchell Station

Unit #2

TB #170X394

Advance Aero Steampath Replacement

Fall Outage 2005

Inspection & Repair Services
General Electric International, Inc.
Pittsburgh Service Center
4930 Buttermilk Hollow Road
West Mifflin, PA 15122-1108
412.469.6080

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JOB SUMMARY

This report documents the work performed for American Electric Power in the Pittsburgh Service Center during the Unit #2 fall 2005 outage at the Mitchell Power Station.

Work performed at the Pittsburgh Service Center as part of the Mitchell Station Unit #2 Advanced Aero Steampath Replacement included:

1. HP/RHT Turbine Rotor Advance Aero Bucket Replacement
2. HP Inner Shell Repairs and Modifications
3. N-1 / N-3 Packing Head – Packing Installation
4. New N-2 Packing Head – Packing Installation
5. HP/RHT Diaphragms Repairs and Modifications
6. First Stage Nozzle Box Repairs and Modifications

This report is assembled from data collected from the following sources:

- John Bishop, Service Shop Manager
- Randy Stephenson, Power Generation Manager
- Jim Locklear, Turbine Engineering
- Bob Masters, Turbine Engineering
- Shop Craftsmen and Technicians

HP/RHT Rotor Advanced Aero Bucket Replacement

In Spring 2005, the American Electric Power spare HP/IP rotor was received and unloaded at the Pittsburgh Service Center to be modified as part of the Mitchell Station Unit # 2 Advanced Aero Steampath Replacement. After all the original buckets were removed from the rotor, initial inspections were performed (see attached data sheets). The rotor was then blast cleaned, and a magnetic particle inspection of the entire rotor was performed. No recordable linear indications were detected during the inspection. (See attached NDE report). A bore plug was manufactured and then installed in generator end of the rotor.

The 2nd through 6th stage diaphragm packing fits and 1st tooth on the N-2 packing lands were machined as part of the Advanced Aero Steampath. (See attached data sheets). According to GE recommendations, the T-1 journal was reconditioned due to an out-of-round state. The T-2 journal was polished in preparation for the multi-step low speed balance process.

A low speed balance of the rotor was performed with all original buckets removed and all other work completed except for the installation of the new Advanced Aero Buckets. Following the initial balance, the new Advanced Aero buckets for the middle stages of the rotor were installed and machined. A second low speed balance of the rotor was performed with only the middle stages of the new buckets installed. The final two end stages of the new Advanced Aero buckets were then installed and machined. A final low speed balance of the rotor was performed with the two end rotor stages of buckets installed. (See attached final balance report). The control was then installed and run-out inspections were performed. (See attached control rotor inspection report).

The rotor was prepared for transportation and shipped to Mitchell Station November 1, 2005.

SEE ATTACHED SUPPORTING DOCUMENTATION

GE Inspection Services

MAGNETIC PARTICLE EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To:	From:	Date:
GE Service Shop	Steve Alger	09/30/2005

Project: Bucket covers/rivets

Purchase Order No:

GEIS Job No: 50123

Item	Weld ☐	Structural ☐	Casting ☐	Machinery ☐	Mach. Parts ☑	Pipe ☐	N/A ☐	Other:
	Non-Weld ☐	Plate ☐	Pipe ☐	Bar ☐	Casting ☐	Mach. Parts ☐	N/A ☐	Other

Material	Size:	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
		2	CS		

Location	Pittsburgh,PA	System	Mitchell
Acceptance Standards	Customer Specifications	Procedure	GEIS QCP #500

Type of Check	Initial	Plate Edge	In Process	Back Gouge	Root Pass	Repair	24 Hr.	7 Day	Final
	☑	☐	☐	☐	☐	☐	☐	☐	☐

Type of Inspection					Other:
	☐ Longitudinal	☑ Coil	☐ DC Probe	☑ Continuous	
	☐ Wet	☐ Dry	☐ Direct Contact	☐ Residual	
	☑ Circular	☐ AC Prod	☐ Yoke	☐ Other	

MT Equipment / Model-Serial No.	Surface Preparation Method
Magnaflux Y-6 SN. NMP009	sand blasted
Inspection Medium / Color	**Demagnetization Method / Equipment**
Circlesafe No. 778 Flourescent	Magnaflux Y-6 SN. NMP009

Results of Inspection

Bucket covers and rivets were examined on all 5 buckets containing rivets.

No reportable indications were observed

☑ Customer Specifications ☑ Accept ☐ Reject	Requested By:	Reported By (Technician):	NDT Supervisor:
	Matthew Mcguire	Steve Alger	Joe Lubrant

NOTICE:
THIS EXAMINATION REPORT IS A REPORT OF THE RESULTS OF THE NDT PROCEDURE ACTUALLY PERFORMED BY THIS COMPANY IT IS SUBJECT TO THE LIMITATIONS OF THE TESTING SPECIFICATIONS AND PROCEDURES WHICH WERE UTILIZED. BY FURNISHING THIS REPORT, *GE INSPECTION SERVICES* DOES NOT GUARANTEE ANY CONDITION OF THE TESTED SPECIMEN.

GE Inspection Services

VISUAL EXAMINATION REPORT

☐ Nuclear ☑ Non-Nuclear

To:	From:	Date:
GE Service Shop	Steve Alger	09/30/2005

Project: Bucket covers/rivets

Purchase Order No:	GEIS Job No:
	50123

Item	Weld ☐	Structural ☐	Casting ☐	Machinery ☐	Mach. Parts ☑	Pipe ☐	N/A ☐	Other:
	Non-Weld ☐	Plate ☐	Pipe ☐	Bar ☐	Casting ☐	Mach. Parts ☐	N/A ☐	Other

Material	Size:	No. of Pieces	Type of Base Metal	Type of Filler Material	Weld ☑ N/A ☐ Smooth ☐ As Welded
		2	CS	NA	

Location		System	
	Pittsburgh,PA		Mitchell
Acceptance Standards	GEIS QCP #800	Procedure	GEIS QCP #800

Type of Inspection

N/A	Accept	Reject		N/A	Accept	Reject	
☑	☐	☐	Joint Preparation	☑	☐	☐	Joint Fit-Up
☑	☐	☐	Arc Strikes	☑	☑	☐	Weld Spatter
☑	☐	☐	Porosity	☑	☐	☐	Weld Contour
☑	☐	☐	Weld Reinforcement	☑	☐	☐	Undercut
☑	☐	☐	Root Pass	☑	☐	☐	Fillet Size
☑	☐	☐	Joint Cleanliness	☐	☑	☐	Indications
☑	☐	☐	Slag	☐	☑	☐	Other: General conditon

Results of Inspection

Bucket covers and rivets were examined on all 5 buckets containing rivets.

No reportable indications were observed

☑ Customer Specifications ☑ Accept ☐ Reject	Requested By:	Reported By (Technician):	NDT Supervisor:
	Matthew Mcguire	Steve Alger	Joe Lubrant

NOTICE:

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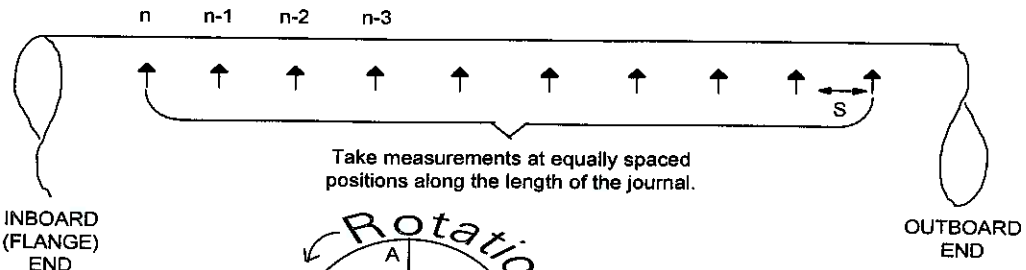
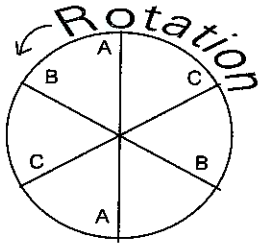
Steam Turbine Rotors

Journal Dimensions

R.O. No.	50123	Journal No.	T1	Type of Rotor	
Customer	AEP	Journal Location	Turb End	HP	
Station	Mitchell			HP-IP	XXX
Turbine S/N		Inspected By	I&RS PGH	IP	
Generator S/N		Date	7/14/2005	IP-LP	
Dwg. No.				LP: A	
		As Found		B	
		As Left	XXX	C	

POSITION





A-A position is at the 0 degree mark or at the No. 1 coupling bolt hole

Number of position points	12
Length of journal surface	12.000
Distance between positions(S)	1.000

Position	90 Deg.	90 Deg.	0 Deg.	Lobe (Out of Round)
1	15.9930	15.9930	15.9930	0.0000
2	15.9930	15.9930	15.9930	0.0000
3	15.9930	15.9930	15.9930	0.0000
4	15.9930	15.9930	15.9930	0.0000
5	15.9930	15.9930	15.9935	0.0005
6	15.9935	15.9930	15.9935	0.0005
7	15.9935	15.9935	15.9935	0.0000
8	15.9935	15.9935	15.9935	0.0000
9	15.9935	15.9935	15.9935	0.0000
10	15.9935	15.9935	15.9935	0.0000
11	15.9935	15.9935	15.9935	0.0000
12	15.9935	15.9935	15.9935	0.0000
Taper	0.0005	0.0005	0.0005	Diameter Variance
Avg. Dia.	15.9933	Jnl Dia. Dwg.		

Additional Comments:

Steam Turbine Rotors

Journal Dimensions

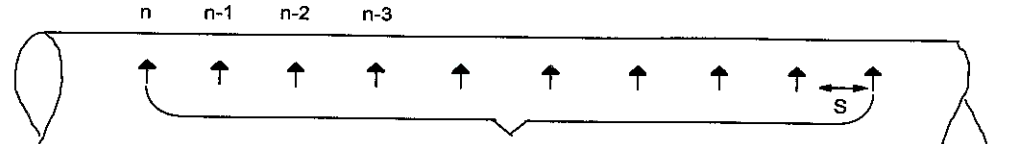
R.O. No.	50123
Customer	AEP
Station	Mitchell
Turbine S/N	
Generator S/N	
Dwg. No.	

Journal No.	T2
Journal Location	Gen End
Inspected By	I&RS PGH
Date	7/14/2005
As Found	
As Left	XXX

Type of Rotor

HP	
HP-IP	XXX
IP	
IP-LP	
LP: A	
B	
C	

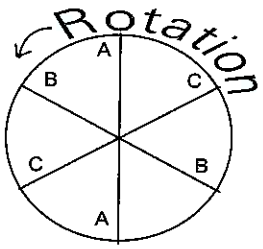
POSITION



Take measurements at equally spaced positions along the length of the journal.

INBOARD (FLANGE) END

OUTBOARD END



A-A position is at the 0 degree mark or at the No. 1 coupling bolt hole

Number of position points	12
Length of journal surface	12.000
Distance between positions(S)	1.000

Position	90 Deg.	90 Deg.	0 Deg.	Lobe (Out of Round)
1	16.9660	16.9660	16.9650	0.0010
2	16.9660	16.9655	16.9650	0.0010
3	16.9660	16.9655	16.9655	0.0005
4	16.9660	16.9655	16.9650	0.0010
5	16.9660	16.9655	16.9655	0.0005
6	16.9660	16.9655	16.9650	0.0010
7	16.9660	16.9655	16.9655	0.0005
8	16.9660	16.9660	16.9655	0.0005
9	16.9660	16.9660	16.9655	0.0005
10	16.9655	16.9660	16.9650	0.0010
11	16.9655	16.9660	16.9655	0.0005
12	16.9660	16.9660	16.9650	0.0010
Taper	0.0005	0.0005	0.0005	Diameter Variance
Avg. Dia.	16.9656	Jnl Dia. Dwg.		

Additional Comments:

Steam Turbine Rotors

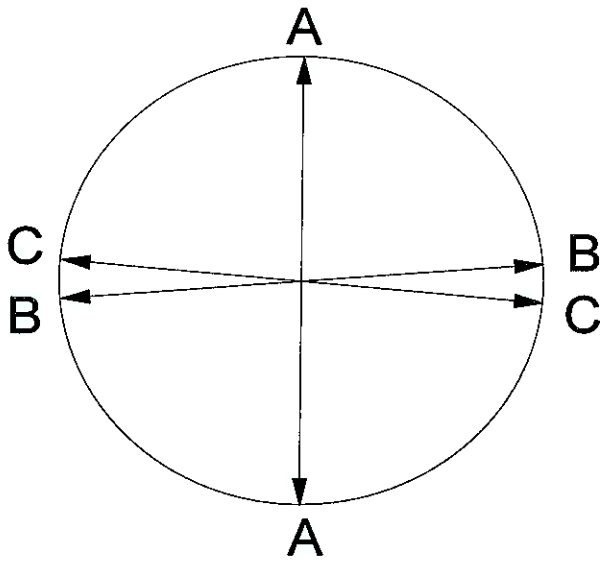
Oil Deflector Rings

R.O. No. 50123
Customer AEP
Station Mitchell

Turbine S/N
Unit No. 1
Dwg. No.
Deflector No.

Inspected By I&RS Pittsburgh
Date 5/17/2005

As Found XXXX
As Left



Tooth Number	Oil Deflector A-Dia	Oil Deflector B-Dia	Oil Deflector C-Dia	Journal Dia	Clearance Average	Clearance Min.	Clearance Max.
T-1				18.4970			
T-2				17.9910			

Comments:
Both fits on T-1 and T-2 were round and striaight with-in .001"

Lite rubbing noted on both fits

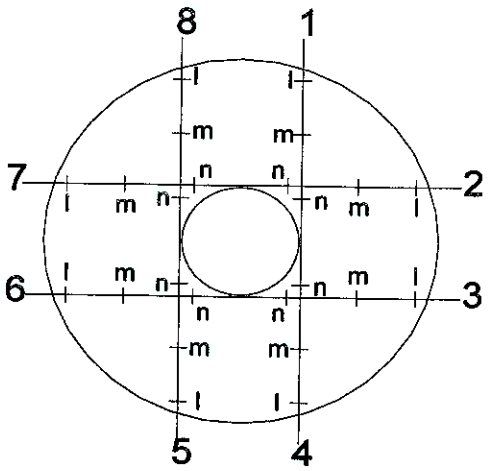
Steam Turbine Rotors

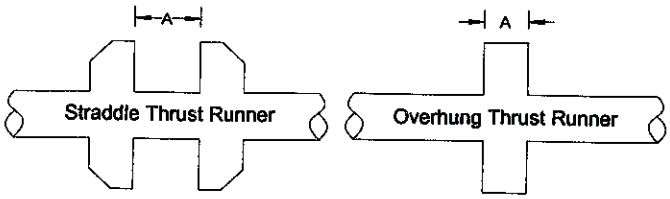
Thrust Runner Inspection

Customer AEP
Station Mitchell
R.O. No. 50123

Stage
Turbine S/N
Inspected By I&RS PITTSBURGH
Date 5/17/2005

XXX As Found [ ] As Left





Dimensional Inspection

	A		
	Inner	Mid	Outer
0°	15.0070	15.0065	15.0065
90°	15.0070	15.0070	15.0065
180°	15.0070	15.0065	15.0065
270°	15.0070	15.0070	15.0065

TE Face Flatness

	1	2	3	4	5	6	7	8
L	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010
N	0.0010	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0010

GE Face Flatness

	1	2	3	4	5	6	7	8
L	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
M	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000
N	0.0000	0.0000	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000

Comments:

Lightly Scored

Steam Turbine Rotors

Coupling Face Flatness & Male / Female Rabbet Interference

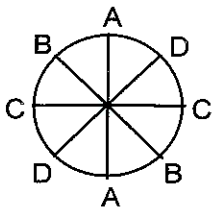
Customer **AEP**
Station **Mitchell**
R.O. No. 50123
Turbine S/N
Coupling Location **Generator End**

Inspected By **GE I&RS Pittsburgh**
Date **5/20/2005**
Unit No.

MALE RABBET

RABBET FIT DIAS

	As Found	As Left
A-A		
B-B		
C-C		
D-D		
Avg.		
O.O.R	0.0000	0.0000



Positive number indicates interference.
Negative number indicates clearance.

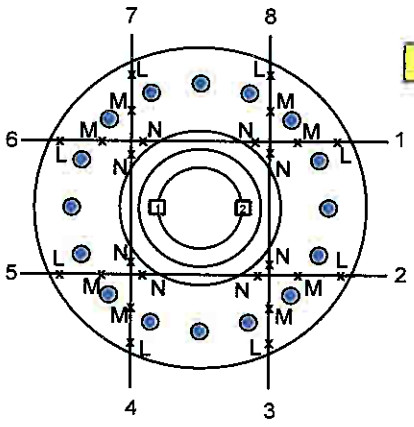
Interference (As Found)

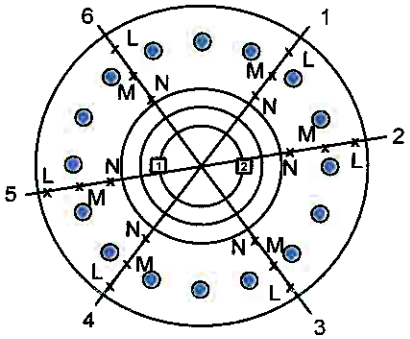
Interference (As Left)

FEMALE RABBET

RABBET FIT DIAS

	As Found	As Left
A-A	21.9980	
B-B	21.9980	
C-C	21.9975	
D-D	21.9975	
Avg.	21.9978	
O.O.R	0.0005	0.0000





MALE RABBET

	As Found			As Left		
	L	M	N	L	M	N
1						
2						
3						
4						
5						
6						
7						
8						

Comments:

FEMALE RABBET

	As Found			As Left		
	L	M	N	L	M	N
1	0.0015	0.0000	0.0000			
2	0.0015	0.0000	0.0000			
3	0.0015	0.0000	0.0000			
4	0.0015	0.0000	0.0000			
5	0.0015	0.0000	0.0000			
6	0.0015	0.0000	0.0000			

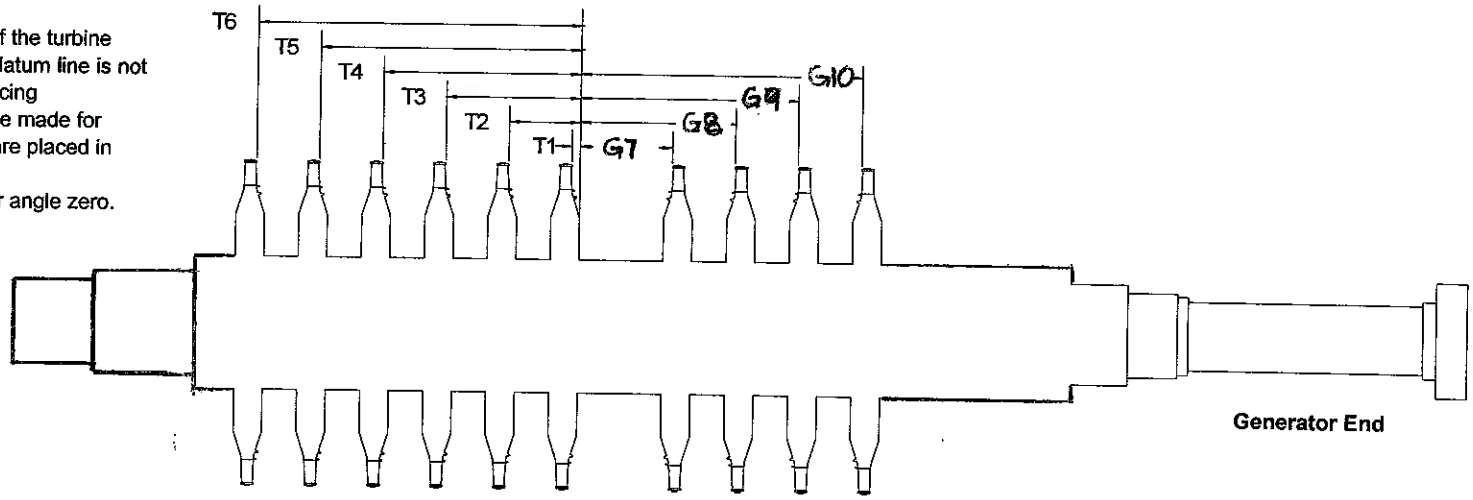
Comments:

Steam Turbine Rotors

Rotor Cover Position

Customer **AEP**
Station **Mitchell Station**
R.O. No. **50123**
Turbine S/N **170X394** ASD
Rotor S/N PGSD
Rotor Dwg. No.
Inspected By **I&RS Pittsburgh**
Date **9/10/2005**

Note:
1. Datum line is located at the front of the turbine end first stage wheel. See figure. If datum line is not within tolerances based on wheel spacing measurements, compensation must be made for machining the covers so that covers are placed in correct axial positions.
2. Measurements to be taking at rotor angle zero.



Stage to Datum Line Cover Locations (See Note)			
Stage	Turbine End		
	Dwg	Actual	Δ
T01	1.184	1.184	0.000
T02	15.791	15.791	0.000
T03	23.772	23.767	-0.005
T04	31.944	31.948	0.004
T05	39.908	39.908	0.000
T06	48.152	48.152	0.000

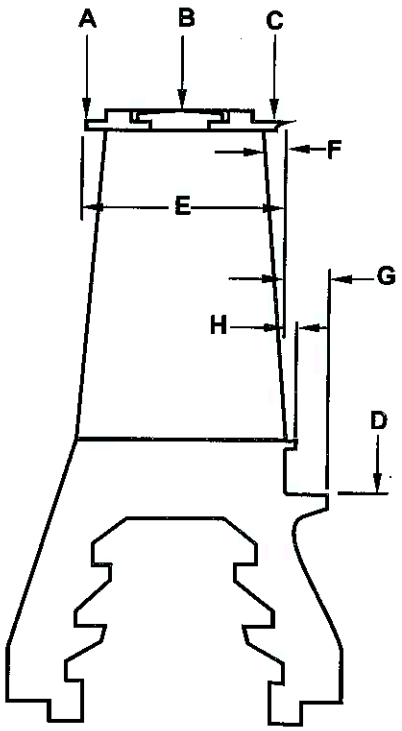
Stage to Datum Line Cover Locations (See Note)			
Stage	Generator End		
	Dwg	Actual	Δ
G07	55.432	55.432	0.000
G08	68.070	68.070	0.000
G09	79.108	79.108	0.000
G10	89.178	89.178	0.000

Measure from front of bucket cover to datum line

Bucket and Cover Final Machining

Advanced Design Steam Path Installation

Date 9/10/2005 **Turbine Serial No.** 170X394 **Prepared by** I&RS Pittsburgh



Rotor Serial No. _____

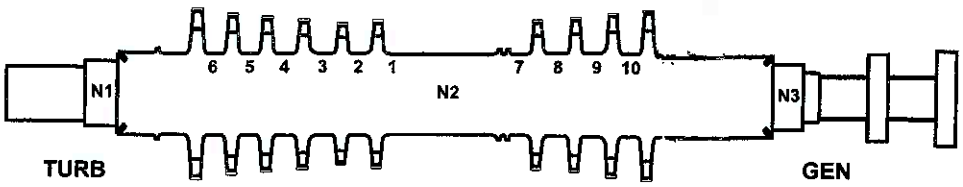
Rotor Asm. Dwg. No. _____

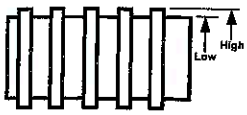
Stage	A. Dia.	B. Dia.	C. Dia.	D. Dia.	E	F	G	H
T01			44.132	38.145	4.294	0.260	1.184	
T02	42.140	42.040	41.900	34.092	2.223	0.240	0.664	0.072
T03	42.743	42.639	42.499	34.607	2.269	0.235	0.670	0.104
T04	43.540	43.440	43.300	34.607	2.418	0.225	0.720	0.154
T05	44.740	44.640	44.500	34.607	2.470	0.250	0.780	0.203
T06	47.340	47.099	46.500	35.488	2.957	0.300	0.899	0.311
G07	52.596		52.596	41.572	2.587	0.122	1.120	0.145
G08	54.718	54.478	54.477	41.572	2.348	0.158	1.358	0.376
G09	56.994	56.754	56.754	42.675	2.497	0.185	1.030	0.536
G10	59.140		58.476	42.675	2.352	0.140	1.149	0.675

HP / IP Rotor Packing Diameters

Thrust in Mid Standard
Advanced Design Steam Path Installation

Date 10/6/2005 **Turbine Serial No.** 170X394 **Prepared by** I&RS Pittsburgh





PACKING DETAIL

Rotor Dwg. No. _____
Rotor Serial No. _____

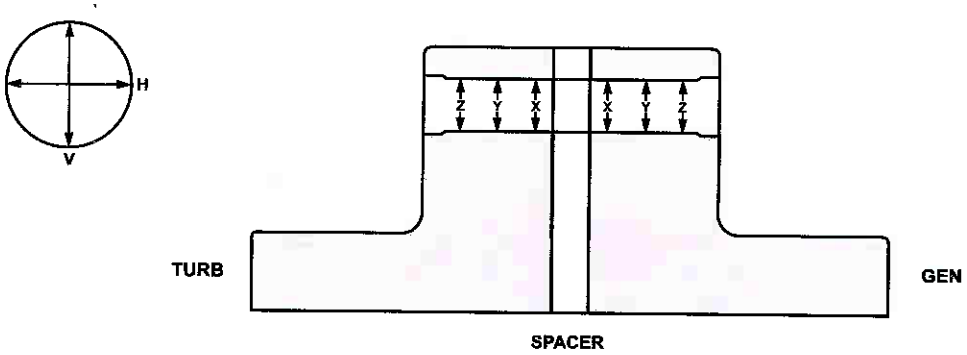
Stage	Diameter – High Actual	Diameter – High Drawing	Diameter – Low Actual	Diameter – Low Drawing	Condition of Lands
N1–G1	19.976		19.724		
N1–G2	19.978		19.722		
N1–G3	27.995		27.748		
N1–G4	27.993		27.746		
N1–G5	27.994		27.746		
N1–G6	27.994		27.746		
N1–G7	27.993		27.746		
6	26.980		26.730		
5	26.980		26.730		
4	26.980		26.730		
3	26.980		26.715		
2	26.980		26.730		
N2–G1	28.162		27.918		
N2–G2	28.162		27.918		
N2–G3	28.165		27.918		
N2–G4	28.162		27.918		
N2–G5	28.165		27.918		
N2–G6	28.165		27.918		
N2–G7	28.162		27.918		
N2–G8	28.162		27.918		
7					
8					
9					
10					
N3–G1	25.994		25.745		
N3–G2	25.993		25.743		
N3–G3	25.995		25.745		
N3–G4	20.976		20.726		
N3–G5	20.975		20.726		

NOTE:

1. If packing diameters are original, record only high land diameters.
2. If packing diameters have been remachined, record both high and low diameters for remachined stages.
3. Land Condition Codes: G–Good RC–Rounded Corners; U (upstream); D (downstream)
   E–Eroded HRC–Heavily Rubbed/Cut E–Other
4. Denote machined (not original) drawing diameters with asterisk (*).
5. Use unit specific packing designations under "Stage" column.

Coupling Bolt Hole Diameters
Advanced Design Steam Path Installation

Date 8/26/2005 **Turbine Serial No.** 170X362 **Prepared by** Pittsburgh I&RS



Coupling Designation Generator
Rotor Drwg. No. 737e550
Rotor Serial No.

Spacer Drwg. No.
Spacer Thickness

Rotor Drwg. No.
Rotor Serial No.

BOLT HOLE DIAMETERS

Coupling Bolt Hole Number	Turbine End						Generator End						Coupling Spacer					
	X		Y		Z		X		Y		Z		X		Y		Z	
	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
1									2.813									
2									2.813									
3									2.828									
4									2.813									
5									2.813									
6									2.823									
7									2.813									
8									2.813									
9									2.813									
10									2.813									
11									2.827									
12									2.813									
13									2.813									
14									2.843									

S1 BALANCE

Steam Turbine Rotors

Final Balance Report

Customer **AEP**
Station **Mitchell Station**
R.O. No. **50123**
Turbine S/N **170X394**

Dwg. No.
Rotor Type **HP RHT**
Inspected By **GE I&RS Pittsburgh**
Date **7/21/2005**

Note: All recorded angles MUST be rotor angles NOT machine angles

Were bolt holes shimmed to obtain identical bolt sizes: [X] Yes [ ] No

BALANCE WEIGHTS

	AS FOUND			AS LEFT	
	Grv Radii	Weight	Rotor Angle	Weight	Rotor Angle
TE Coupling Balance Groove					
TE Factory Balance Groove	14.500	695gm	220	434gm	235
TE Field Balance Groove					
Midspan Factory Balance Groove	15.625	547gm	240	450gm	260
Midspan Field Balance Groove					
GE Factory Balance Groove	16.875	261gm	280	452gm	280
GE Field Balance Groove					
GE Coupling Balance Groove					

Note: Remove only as instructed by engineering.

ALANCE READINGS WITH WEIGHTS REMOVED

Bal. Groove	mplitude or w	Rotor Angle
TE Journal		
GE Journal		

WEIGHTS USED TO OBTAIN LOW SPEED BA

Bal. Groove	Weight	Rotor Angle
TE Journal	579gm	242
GE Journal	690gm	273

MIDSPAN RUNOUT

Maximum TIR	0.0040
Location (Rotor Angles)	45
Axial Location of Runout	mid span

RESOLVED WEIGHT PLACEMENT

Bal. Groove	Weight	Rotor Angle
TE Location	340gm	380
Midspan Factory	450gm	260
GE Journal	475gm	280

Note: Resolved weight placement informantion obtained from engineering

FINAL BALANCE READINGS

Bal. Groove	Weight	Rotor Angle
TE Journal	9gm	287
GE Journal	9gm	90

Note: Readings taken after trimming.

Comments:

1ST STEP BALANCE

S2 BALANCE

Steam Turbine Rotors

Final Balance Report

Customer **AEP**
Station **Mitchell Station**
R.O. No. **50123**
Turbine S/N **170X394**

Dwg. No.
Rotor Type **HP RHT**
Inspected By **GE I&RS Pittsburgh**
Date **9/6/2005**

Note: All recorded angles MUST be rotor angles NOT machine angles

Were bolt holes shimmed to obtain identical bolt sizes: [X] Yes [ ] No

BALANCE WEIGHTS

	S2 BALANCE			AS LEFT	
	Grv Radii	Weight	Rotor Angle	Weight	Rotor Angle
TE Coupling Balance Groove					
TE Factory Balance Groove	14.500			120gm	40
TE Field Balance Groove					
Midspan Factory Balance Groove	15.625			1259gm	176
Midspan Field Balance Groove					
GE Factory Balance Groove	16.875			365gm	185
GE Field Balance Groove					
GE Coupling Balance Groove					

Note: Remove only as instructed by engineering.

ALANCE READINGS WITH WEIGHTS REMOVED

Bal. Groove	mplitude or w	Rotor Angle
TE Journal		
GE Journal		

WEIGHTS USED TO OBTAIN LOW SPEED BA

Bal. Groove	Weight	Rotor Angle
TE Journal	405gm	165
GE Journal	1100gm	180

MIDSPAN RUNOUT

Maximum TIR	0.0040
Location (Rotor Angles)	45
Axial Location of Runout	mid span

RESOLVED WEIGHT PLACEMENT

Bal. Groove	Weight	Rotor Angle
TE Location	292gm	12
Midspan Factory	1259gm	176
GE Journal	520gm	184

Note: Resolved weight placement informantion obtained from engineering

FINAL BALANCE READINGS

Bal. Groove	Weight	Rotor Angle
TE Journal	5.34gm	44
GE Journal	13.3gm	165

Note: Readings taken after trimming.

Comments:

2ND STEP BALANCE

S3 BALANCE

Steam Turbine Rotors

Final Balance Report

Customer **AEP**
Station **Mitchell Station**
R.O. No. **50123**
Turbine S/N **170X394**

Dwg. No.
Rotor Type **HP RHT**
Inspected By **GE I&RS Pittsburgh**
Date **9/26/2005**

Note: All recorded angles MUST be rotor angles NOT machine angles

Were bolt holes shimmed to obtain identical bolt sizes: [X] Yes [ ] No

BALANCE WEIGHTS

		S3 BALANCE		AS LEFT	
	Grv Radii	Weight	Rotor Angle	Weight	Rotor Angle
TE Coupling Balance Groove					
TE Factory Balance Groove	14.500			166gm	20
TE Field Balance Groove					
Midspan Factory Balance Groove	15.625				
Midspan Field Balance Groove					
GE Factory Balance Groove	16.875			199.5gm	15
GE Field Balance Groove					
GE Coupling Balance Groove					

Note: Remove only as instructed by engineering.

ALANCE READINGS WITH WEIGHTS REMOVED

Bal. Groove	mplitude or w	Rotor Angle
TE Journal		
GE Journal		

WEIGHTS USED TO OBTAIN LOW SPEED BA

Bal. Groove	Weight	Rotor Angle
TE Journal	166gm	20
GE Journal	199.5gm	15

MIDSPAN RUNOUT

Maximum TIR	0.0040
Location (Rotor Angles)	45
Axial Location of Runout	mid span

RESOLVED WEIGHT PLACEMENT

Bal. Groove	Weight	Rotor Angle
TE Location		
Midspan Factory		
GE Journal		

Note: Resolved weight placement informantion obtained from engineering

FINAL BALANCE READINGS

Bal. Groove	Weight	Rotor Angle
TE Journal	14.9gm	355
GE Journal	12.5gm	50

Note: Readings taken after trimming.

Comments:

3RD/FINAL STEP BALANCE

Steam Turbine Rotors

AEP - Mitchell

Contol Rotor Inspection

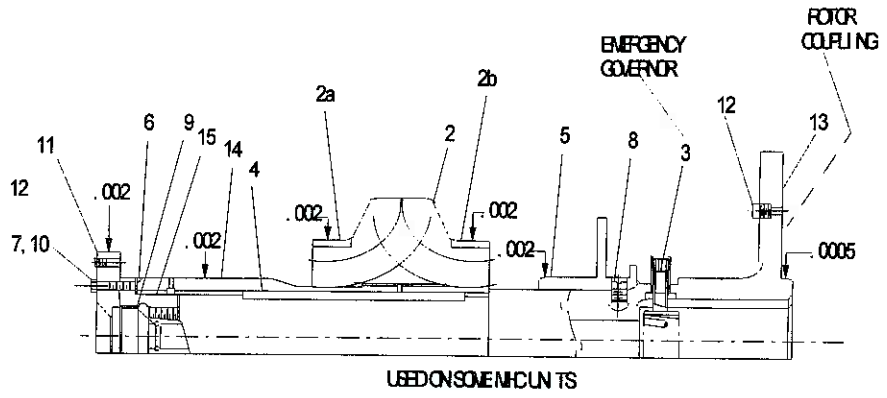
Job No. 50123

Dwg. No.

Insp. by I&RS Pittsburgh

Turbine No. 170X394

Date 10/13/2005



RADIAL RUNOUT INSPECTION - WITH CONTROL ROTOR ON HP ROTOR

AREA INDICATED	0°	45°	90°	135°	180°	225°	270°	315°
2. IMPELLER	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
a. wear ring	.0000	.0000	.0005	.0000	.0000	.0000	.0000	.0000
b. wear ring	.0000	.0000	.0005	.0010	.0005	.0000	.0000	.0000
5. BEARING COLLAR	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0050
11. RING	.0000	.0005	.0015	.0030	.0015	.0000	.0000	.0000
13. STUB SHAFT	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
14. BUSHING	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000

DIMENSIONAL INSPECTION

AREA MEASURED	0°	45°	90°	
2. IMPELLER	12.495	12.495	12.495	
a. wear ring	8.7310	8.7305	8.7305	
b. wear ring	8.7300	8.7300	8.7300	
5. BEARING COLLAR	5.3710	5.3710	5.3710	
14. BUSHING	5.3120	5.3120	5.3120	
RABBET	5.0470	5.0470	5.0470	Patch Ring
RABBET on HP	5.0470	5.0470	5.0470	After Machining

HP/Inner Shell Repairs and Modifications

The lower half inner shell was picked up at A.E.P. Central Machine Shop and transported to the Pittsburgh Service Center. Work on the lower half shell consisted of welding the "B" main steam inlet bore retaining ring groove area and 2nd stg pressure tap fit area. Upon completion of the welding the lower half was shipped to GE vendor (Highway Machine) for completion of the boring mill work.

Once the upper half shell was received from C.M.S. it was assembled to the lower, the joint bolts were stretched and set up on the V.B.M. All of the HP and RH diaphragm seal faces were skin cut .030". The crush pin side of the pockets was not cut. The nozzle box and N-2 packing case rabbet fits were trued up, the "B". Inlet bore was machined, the remaining main steam inlets, reheat steam inlets and cooling steam extraction bores were rounded out. Also while at the vendor the centering pins were removed bores rounded out, and the orfice block and piping was removed.

With all the machine work requiring a VBM complete, the halves were shipped back to the Pittsburgh Service Center. The remaining work completed in the shop consisted of installing centering pins, replace the 8th stage cooling steam inlet boss, orfice and piping, installed spring back keys, blended indications in the 2nd stg diaphragm ledge area and diaphragm pocket radius, removed 4 broken nozzle box hold down bolts, replace horizontal joint stud, and machine welded pressure tap fit area.

While in the shop the stationary components, including the 1st stage nozzle box, N-2 packing case, and diaphragms were installed in both halves of the shell to check proper clearances and locations. The nozzle box keys were fit and blue checked.

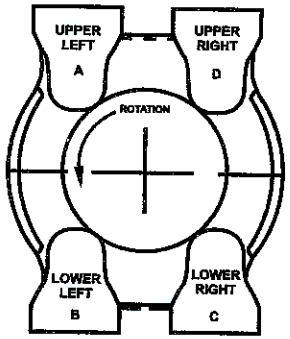
The lower half gib post was hand worked to remove taper. The upper half was shipped to the AEP Central machine Shop for machining of the gip post.

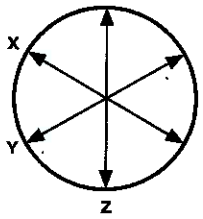
SEE ATTACHED SUPPORTING DOCUMENTATION

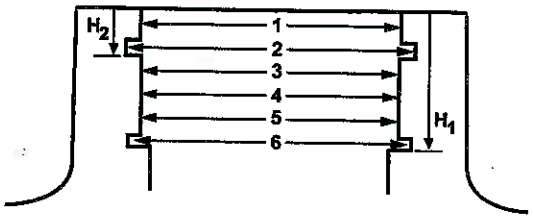
Shell and Nozzle Box Seal Ring Bores

Advanced Design Steam Path Installation

Date 12/2/2005 **Turbine Serial No.** 170X394 **Prepared by** R. Masters







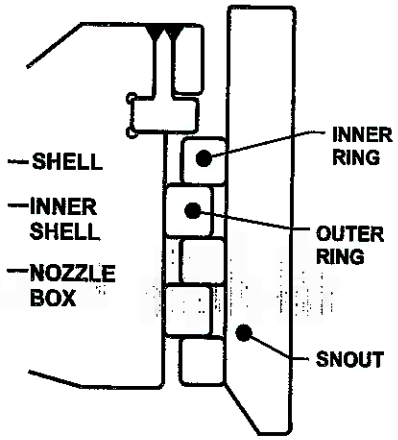
Reheat Inlets

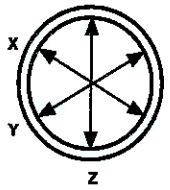
	A Upper Left Bore Diameter				B Lower Left Bore Diameter				C Lower Right Bore Diameter				D Upper Right Bore Diameter			
Outer Shell	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
1																
2																
3																
4																
5																
6																
Taper (max-min) H1 + H2																
Inner Shell	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
1	19.335	19.335	19.335	0.000	19.317	19.317	19.317	0.000	19.317	19.317	19.317	0.000	19.335	19.336	19.336	0.001
2	19.775	19.777	19.781	0.006	19.794	19.798	19.800	0.006	19.787	19.791	19.793	0.006	19.785	19.686	19.800	0.114
3	19.324	19.325	19.325	0.001	19.310	19.310	19.310	0.000	19.310	19.310	19.310	0.000	19.323	19.323	19.323	0.000
4	19.324	19.324	19.325	0.001	19.310	19.310	19.310	0.000	19.310	19.310	19.310	0.000	19.324	19.324	19.324	0.000
5	19.324	19.324	19.325	0.001	19.310	19.310	19.310	0.000	19.310	19.310	19.310	0.000	19.423	19.324	19.325	0.099
6																
Taper (max-min) H1	NA	NA	NA		NA	NA	NA		NA	NA	NA		NA	NA	NA	
Nozzle	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
1																
2																
3																
4																
5																
6																
Taper (max-min) H1														NA	NA	

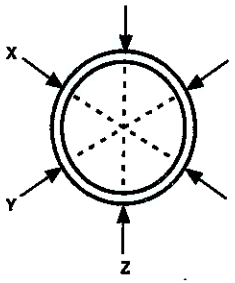
Seal Rings

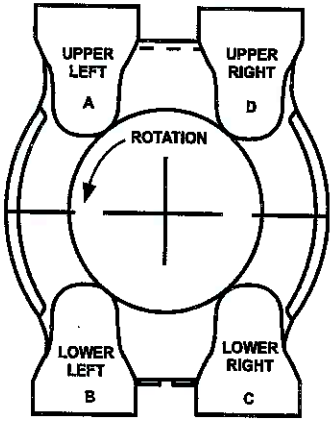
Advanced Design Steam Path Installation

Date Nov. 30, 2005 **Turbine Serial No.** 170 X 394 **Prepared by** Vince Kollin









NOTE:

1. **Inner diameters required for the inner seal rings. Outer diameters required for the outer seal rings.**
2. **Seal ring identification:**
   Conventional _____ **Bi-Metallic** X
3. **Seal Ring Assy. Dwg. No:**
   Outer Shell _____ **Inner Shell** Reheat **Nozzle** _____
4. **Numbering is in direction of steam flow.**

OUTER SHELL	A Upper Left Ring Diameter			B Lower Left Ring Diameter			C Lower Right Ring Diameter			D Upper Right Ring Diameter		
INNER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	17.495"	17.495"	17.495"	17.513"	17.513"	17.513"	17.509"	17.509"	17.509"	17.480"	17.480"	17.480"
2	17.495"	17.495"	17.495"	17.513"	17.513"	17.513"	17.509"	17.509"	17.509"	17.480"	17.480"	17.480"
3	17.495"	17.495"	17.495"	17.513"	17.513"	17.513"	17.509"	17.509"	17.509"	17.480"	17.480"	17.480"
4												
5												
6												
OUTER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	19.324	19.324	19.324	19.308"	19.308"	19.308"	19.308"	19.308"	19.308"	19.323	19.323	19.323
2	19.323	19.323	19.323	19.308"	19.308"	19.308"	19.308"	19.308"	19.308"	19.324	19.324	19.324
3												
4												

Global Power Generation Services

Company Proprietary Information

Seal Rings

Advanced Design Steam Path Installation

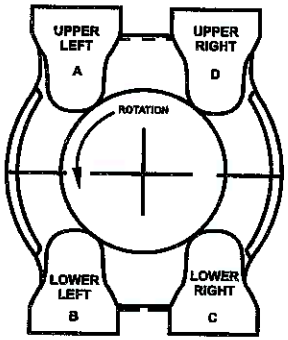
INNER SHELL	A Upper Left Ring Diameter			B Lower Left Ring Diameter			C Lower Right Ring Diameter			D Upper Right Ring Diameter		
INNER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	10.995"	10.996"	10.996"	11.011"	11.011"	11.011"	11.011"	11.011"	11.011"	10.997"	10.997"	10.997"
2	10.996"	10.996"	10.996"	11.011"	11.011"	11.011"	11.011"	11.011"	11.011"	10.997"	10.997"	10.997"
3	10.997"	10.997"	10.997"	11.011"	11.011"	11.011"	11.011"	11.011"	11.011"	10.997"	10.997"	10.997"
4												
5												
6												
OUTER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	12.779"	12.778"	12.779"	12.781"	12.780"	12.780"	12.779"	12.778"	12.779"	12.774"	12.774"	12.775"
2	12.776"	12.776"	12.776"	12.779"	12.780"	12.779"	12.779"	12.779"	12.779"	12.775"	12.775"	12.775"
3												
4	12.776"	12.776"	12.776"	12.778"	12.778"	12.778"	12.778"	12.778"	12.778"	12.774"	12.774"	12.774"

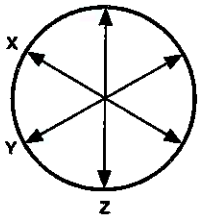
NOZZLE BOX	A Upper Left Ring Diameter			B Lower Left Ring Diameter			C Lower Right Ring Diameter			D Upper Right Ring Diameter		
INNER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	12.234	12.250	12.234	12.260	12.261	12.261	12.262	12.261	12.261	12.245	12.246	12.245
2	12.234	12.234	12.234	12.260	12.260	12.260	12.261	12.262	12.262	12.245	12.245	12.244
3	12.235	12.234	12.234	12.260	12.259	12.260	12.262	12.262	12.262	12.246	12.245	12.245
4												
5												
6												
OUTER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	14.246	14.247	14.246	14.248	14.247	14.249	14.247	14.248	14.248	14.248	14.247	14.249
2	14.247	14.247	14.247	14.247	14.248	14.248	14.247	14.247	14.248	14.247	14.248	14.248
3	14.246	14.246	14.246	14.248	14.247	14.247	14.248	14.249	14.248	14.248	14.247	14.247
4												

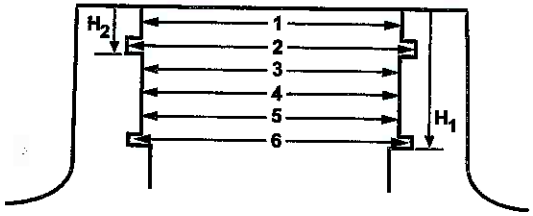
Shell and Nozzle Box Seal Ring Bores

Advanced Design Steam Path Installation

Date 12/2/2005 **Turbine Serial No.** 170X394 **Prepared by** R. Masters



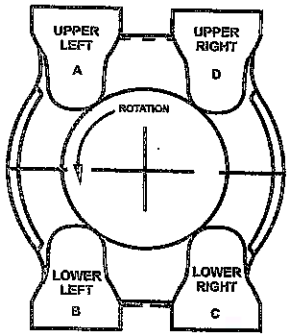




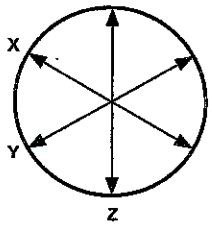
	A Upper Left Bore Diameter				B Lower Left Bore Diameter				C Lower Right Bore Diameter				D Upper Right Bore Diameter			
Outer Shell	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**
1																
2																
3																
4																
5																
6																
Taper (max-min)																
H1 + H2																
Inner Shell	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**
1	15.008	15.008	15.008		14.010	14.010	14.010		14.029	14.029	14.029		15.008	15.008	15.008	
2	14.760	14.762	14.762		14.754	14.754	14.756		14.901	14.914	14.914		14.789	14.790	14.791	
3	12.778	12.778	12.778		12.782	12.781	12.781		12.781	12.781	12.781		12.776	12.776	12.777	
4	12.778	12.778	12.778		12.782	12.782	12.782		12.782	12.782	12.782		12.776	12.777	12.776	
5	12.778	12.778	12.778		12.781	12.781	12.781		12.782	12.782	12.782		12.774	12.774	12.774	
6																
Taper (max-min)																
H1																
Nozzle	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**
1	14.261	14.261	14.262	0.001	14.261	14.262	14.262	0.001	14.261	14.262	14.262	0.001	14.261	14.261	14.262	0.001
2	15.641	15.642	15.641	0.001	15.653	15.654	15.655	0.002	15.635	15.640	15.641	0.006	15.639	15.639	15.640	0.001
3	14.248	14.249	14.248	0.001	14.249	14.250	14.250	0.001	14.249	14.250	14.250	0.001	14.249	14.249	14.249	0.001
4	14.248	14.248	14.248	0.000	14.249	14.250	14.249	0.001	14.249	14.250	14.250	0.001	14.249	14.249	14.249	0.000
5	14.248	14.249	14.248	0.001	14.249	14.249	14.249	0.000	14.249	14.249	14.250	0.001	14.249	14.249	14.249	0.000
6																
Taper (max-min)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
H1																

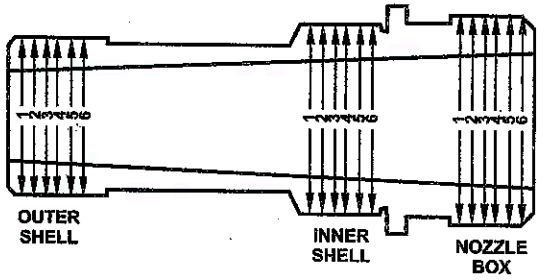
Seal Ring Snout Pipe
Advanced Design Steam Path Installation

Date ###### **Turbine Serial No.** 170 X394 **Prepared by** Craig Schmotzer



Reworked pipes from CMS





NOTE:

1. **Snout pipe diameters recorded on this form.**
2. **No flat spots allowed.**
3. **Tolerances: Taper .003", Out of Round .005".**

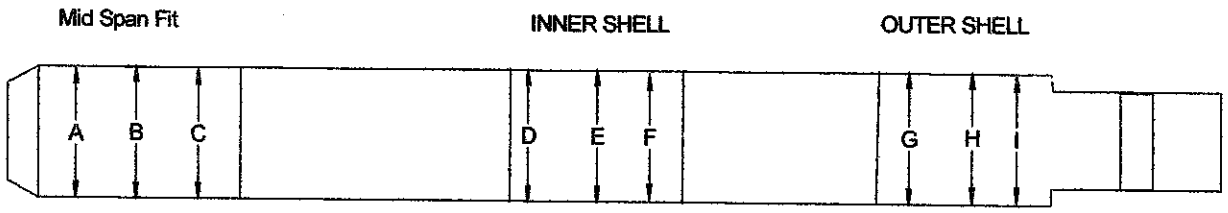
	A Upper Left Snout Diameter				B Lower Left Snout Diameter				C Lower Right Snout Diameter				D Upper Right Snout Diameter			
Outer Shell	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**
1	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500	10.500	0.000	10.478"	10.478"	10.478"	
2	10.420"	10.420"	10.420"		10.500	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
3	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
4	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
5	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
6	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
Taper (max-min)					0.000		0.000			0.000	0.000					
Inner Shell	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**
1	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
2	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
3	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
4	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
5	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
6	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
Taper					0.000	0.000	0.000		0.000	0.000	0.000					
Nozzle	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**	**X**	**Y**	**Z**	**O.O.R.**
1	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
2	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
3	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
4	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
5	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
6	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
Taper					0.000	0.000	0.000		0.000	0.000	0.000					

Blow Down Pipe

Dense Pack Steam Path Installation

Date N0v. 30, 2005 **Turbine Serial No.** 170 X 394 **Prepared by** Vince Kollin

HP Blow Down Pipe

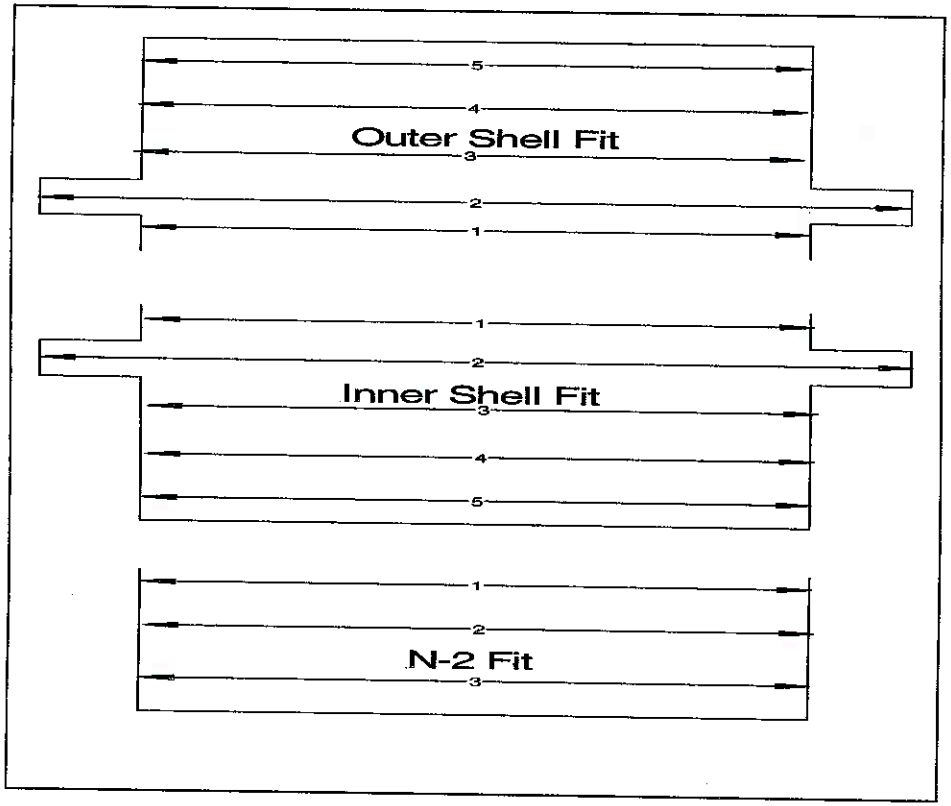


	Mid Span					INNER SHELL					OUTER SHELL			
	X	Y	Z	O.O.R.		X	Y	Z	O.O.R.		X	Y	Z	O.O.R.
A	3.355	3.356	3.356	0.001	D	3.365	3.366	3.366	0.001	G	3.375	3.376	3.376	0.001
B	3.355	3.356	3.356	0.001	E	3.365	3.366	3.366	0.001	H	3.375	3.376	3.376	0.001
C	3.355	3.356	3.356	0.001	F	3.365	3.366	3.366	0.001	I	3.375	3.376	3.376	0.001
Taper (max-min)	0.000	0.000	0.000		Taper	0.000	0.000	0.000		Taper	0.000	0.000	0.000	

Blow Down Ring Bores

Dense Pack Steam Path Installation

Date Nov. 30, 2005 **Turbine Serial No.** 170 X 394 **Prepared by** Vince Kollin



	Outer Shell Fit				Inner Shell Fit				N-2 Fit			
	0	45	90	O.O.R.	0	45	90	O.O.R.	0	45	90	O.O.R.
1	5.144"	5.142"	5.140"		5.138	5.139	5.139		3.357	3.357	3.357	
2	5.765"	5.765"	5.765"		5.139	5.139	5.140		3.357	3.357	3.357	
3	5.139"	5.139"	5.139"		5.137	5.138	5.137		3.357	3.357	3.357	
4	5.138"	5.138"	5.138"									
5	5.138"	5.138"	5.138"									
aper (max-min)									0.000	0.000	0.000	

N-1 / N-3 Packing Head

Packing was installed, butt clearances checked and corrections made as necessary. The upper & lower halves were assembled for measurements of the hook fits. The hook fits were rounded out. Reroundable packing was supplied, installed, and adjusted to achieve a round and straight bore with proper clearances.

New N-2 Packing Head

Packing was installed and butt clearances checked. Corrections were made as necessary.

The upper and lower halves were assembled and the teeth measured to insure proper size and clearances.

The centering pin was machined to correct side slip to inner shell.

The rabbet fit was machined to achieve the correct axial location and clearance to shell.

Machined the balance access hole (stock left in bore for field machining) to accommodate the new balance pipe.

Machined, installed, & seal welded a plug in the mid span eccentricity hole. The holes in the outer and inner shells had been previously plugged.

SEE ATTACHED SUPPORT DOCUMENTATION

General Electric Co.

Job Number: 29035
Customer: Mitchell
Date:
Page 1 of 1

N - 1 Packing Case - Butt Clearance

Location:	Dwg. Butt Clearance	As found Butt Clearance	Corrected Butt Clearance	Date completed and operator initials
N01 G03	0.012	0.012		
N01 G04	0.012	0.012		
N01 G05	0.012	0.011		
N01 G06	0.012	0.009		
N01 G07	0.012	0.012		

General Electric Co.

Job Number: 29035
Customer: AEP Mitchell

N - 2 Packing Case - Butt Clearance

Location:	Dwg. Butt Clearance	As found Butt Clearance	Corrected Butt Clearance	Date completed and operator initials
N02 G01	0.012	0.009		
N02 G02	0.012	0.002		
N02 G03	0.012	0		
N02 G04	0.012	0.031		
N02 G05	0.012	0.016		
N02 G06	0.012	0.01		
N02 G07	0.012	0.007		

HP/RHT Diaphragms

Packing was installed in all diaphragms and butt clearances were checked. Corrections were made as necessary.

Centering pins were machined to set side clearances.

All diaphragms were set up on a vertical boring mill and steam seal faces were machined for fit up to the seal face ledges in the shell.

Crush pins on all diaphragms were sized for proper clearances to the shell.

The 8th stage diaphragm was spotted to the inner shell and set up on a horizontal boring mill and thermocouple wells were installed in line with corresponding centerline of thermocouple in inner shell within 0.005". The diaphragm was then assembled to the 7th stage. (Stacked)

First Stage Nozzle Box

The customer's spare nozzle box was refurbished in the Albany Shop to meet the design conditions for the ADSP.

The halves were assembled and set – up on a horizontal boring mill rotary table to machine the axial locating female rabbet fit to achieve the correct axial location and clearance to shell.

The sealing rings were set- up machined and installed in the nozzle box prior to shipping.

SEE ATTACHED SUPPORT DOCUMENTATION

General Electric Co.

Job Number: 29035
Customer: Mitchell

Date:
Page 1 of 1

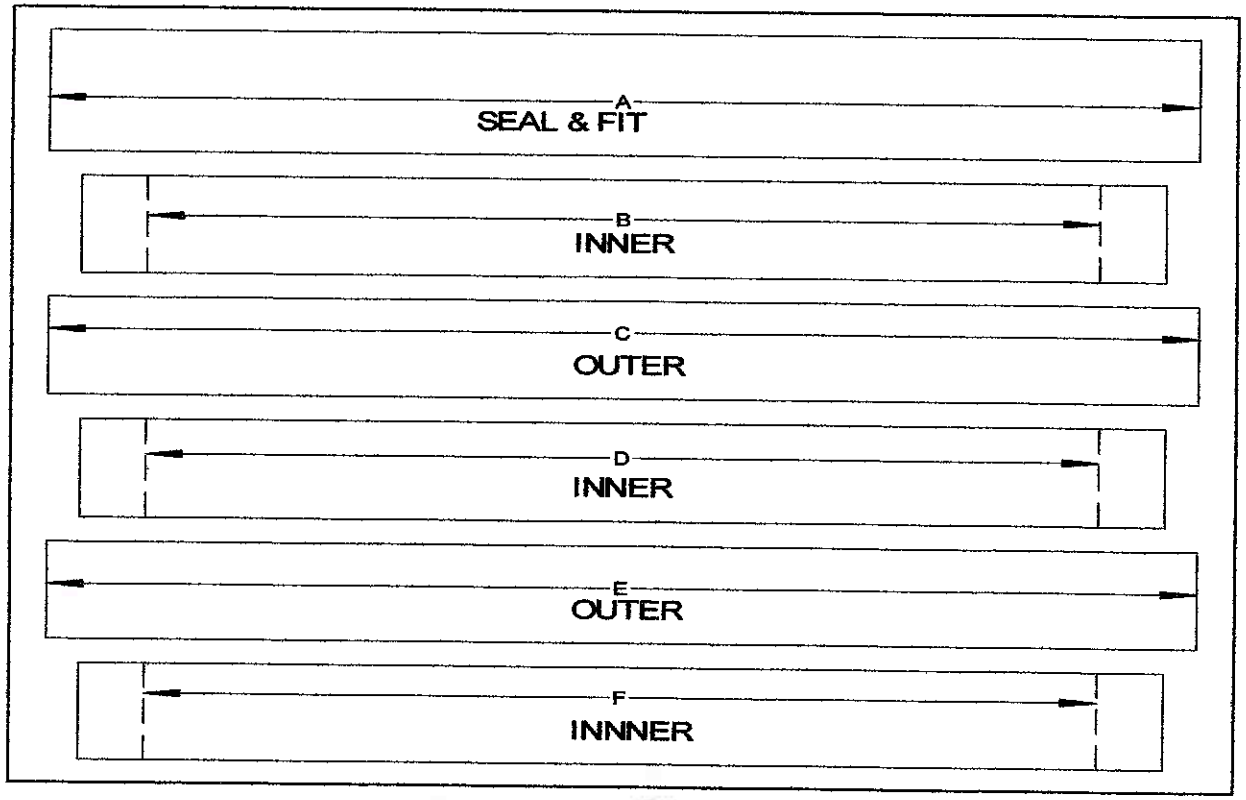
Diaphragm Packing - Butt Clearance

Location:	Dwg. Butt Clearance	As found Butt Clearance	Corrected Butt Clearance	Date completed and operator initials
Stg 2	0.012	0.014		
Stg 3	0.012	0.018		
Stg 4	0.012	0.036		
Stg 5	0.012	0.012		
Stg 6	0.012	0.018		
Stg 7 Stg 7 Seal	0.012 0.377	0.007 0.377		
Stg 8	0.012	0.011		
Stg 9	0.012	0.02		
Stg 10	0.012	0.01		

Final Outer Shell Blow Down Ring Diameter

Dense Pack Steam Path Installation

Date Nov. 30, 2005 **Turbine Serial No.** 170 X 394 **Prepared by** Vince Kollin



	Final Ring Sizes			
	X	Y	Z	O.O.R.
A	5.138"	5.138"	5.138"	
B	3.378"	3.378"	3.378"	
C	5.136"	5.136"	5.136"	
D	3.379"	3.379"	3.379"	
E	5.136"	5.136"	5.136"	
F	3.378"	3.378"	3.378"	

Fill in the Blank

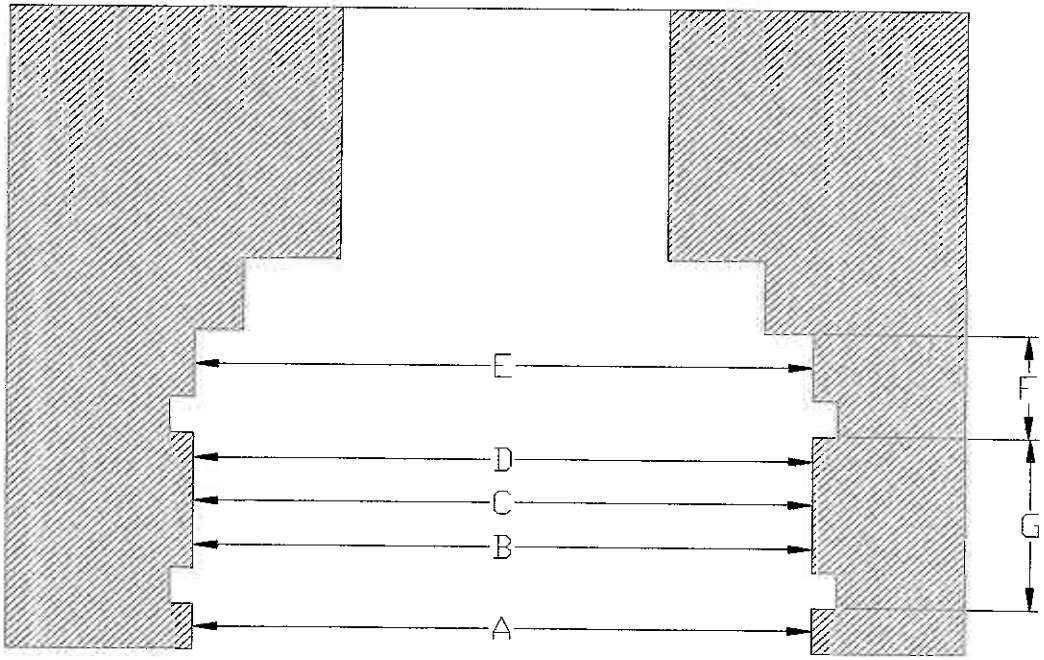
Dense Pack Steam Path Installation

Customer: **AEP Mitchell**
Station: **Unit # 2**

Turbine S/N **170X394**

Prepaired By: **Vince Kollin**
Date: **Nov. 30,2005**

Reheat Outer Shell



	A Upper Left Ring Diameter				B Lower Left Ring Diameter				C Lower Right Ring Diameter				D Upper Right Ring Diameter			
Outer Shell	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
A	19.337"	19.337"	19.337"		19.320"	19.320"	19.320"		19.320"	19.320"	19.320"		19.337"	19.337"	19.337"	
B	19.327"	19.327"	19.327"		19.310"	19.310"	19.310"		19.310"	19.310"	19.310"		19.325"	19.325"	19.325"	
C	19.327"	19.327"	19.327"		19.310"	19.310"	19.310"		19.310"	19.310"	19.310"		19.325"	19.325"	19.325"	
D	19.327"	19.327"	19.327"		19.310"	19.310"	19.310"		19.310"	19.310"	19.310"		19.3260	19.3260	19.3260	0.0000
E																
F																
G																

Seal Rings

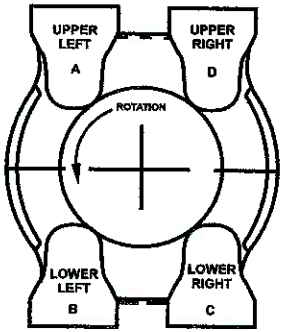
Advanced Design Steam Path Installation

INNER SHELL	A Upper Left Ring Diameter			B Lower Left Ring Diameter			C Lower Right Ring Diameter			D Upper Right Ring Diameter		
INNER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	10.995"	10.996"	10.996"	11.011"	11.011"	11.011"	11.011"	11.011"	11.011"	10.997"	10.997"	10.997"
2	10.996"	10.996"	10.996"	11.011"	11.011"	11.011"	11.011"	11.011"	11.011"	10.997"	10.997"	10.997"
3	10.997"	10.997"	10.997"	11.011"	11.011"	11.011"	11.011"	11.011"	11.011"	10.997"	10.997"	10.997"
4												
5												
6												
OUTER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1	12.779"	12.778"	12.779"	12.781"	12.780"	12.780"	12.779"	12.778"	12.779"	12.779"	12.779"	12.779"
2	12.776"	12.776"	12.776"	12.779"	12.780"	12.779"	12.779"	12.779"	12.779"	12.779"	12.779"	12.779"
3												
4	12.776"	12.776"	12.776"	12.778"	12.778"	12.778"	12.778"	12.778"	12.778"	12.774"	12.774"	12.774"

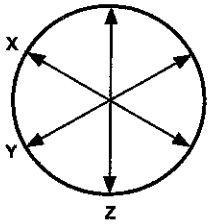
NOZZLE BOX	A Upper Left Ring Diameter			B Lower Left Ring Diameter			C Lower Right Ring Diameter			D Upper Right Ring Diameter		
INNER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1												
2												
3												
4												
5												
6												
OUTER RINGS	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z
1												
2												
3												
4												

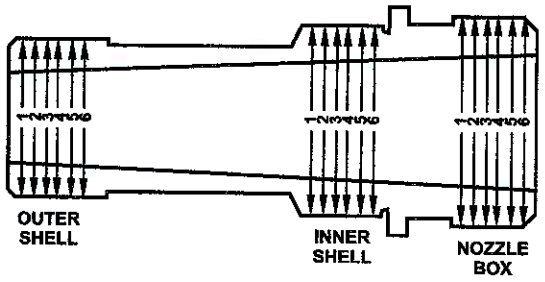
Seal Ring Snout Pipe
Advanced Design Steam Path Installation

Date ###### **Turbine Serial No.** 170 X394 **Prepared by** Craig Schmotzer



Reworked pipes from CMS



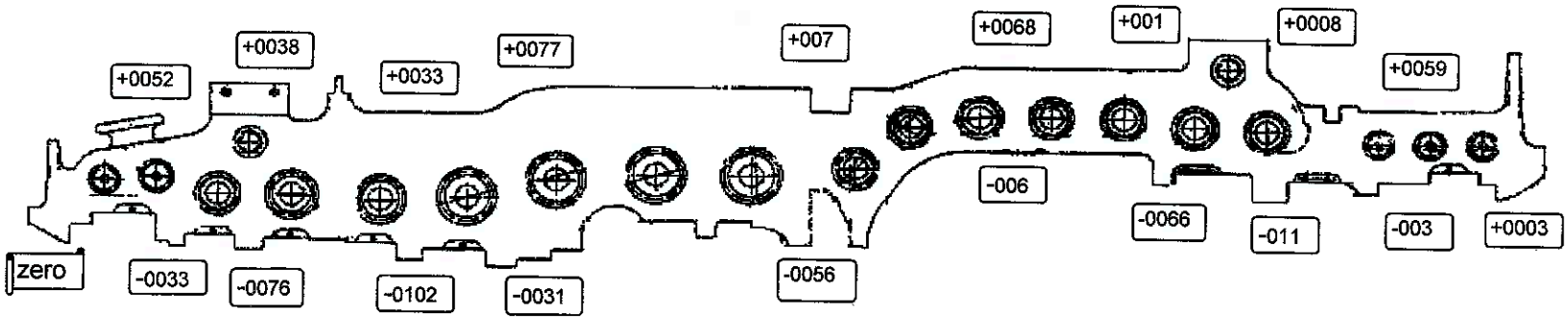


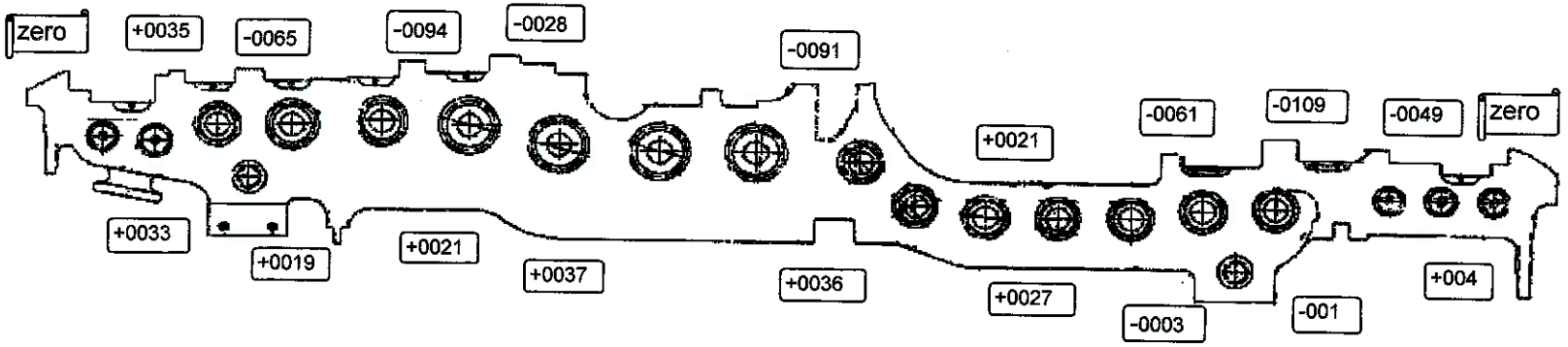
NOTE:

1. **Snout pipe diameters recorded on this form.**
2. **No flat spots allowed.**
3. **Tolerances: Taper .003", Out of Round .005".**

	A Upper Left Snout Diameter				B Lower Left Snout Diameter				C Lower Right Snout Diameter				D Upper Right Snout Diameter			
Outer Shell	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
1	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500	10.500	0.000	10.478"	10.478"	10.478"	
2	10.420"	10.420"	10.420"		10.500	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
3	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
4	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
5	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
6	10.420"	10.420"	10.420"		10.500"	10.500"	10.500	0.000	10.500"	10.500"	10.500"		10.478"	10.478"	10.478"	
Taper (max-min)					0.000		0.000			0.000	0.000					
Inner Shell	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
1	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
2	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
3	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
4	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
5	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
6	10.985"	10.985"	10.985"		10.999	10.999	10.999	0.000	10.999	10.999	10.999	0.000	10.965"	10.965"	10.965"	
Taper					0.000	0.000	0.000		0.000	0.000	0.000					
Nozzle	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.	X	Y	Z	O.O.R.
1	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
2	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
3	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
4	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
5	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
6	12.220"	12.220"	12.220"		12.247	12.247	12.247	0.000	12.249	12.249	12.249	0.000	12.231"	12.231"	12.231"	
Taper					0.000	0.000	0.000		0.000	0.000	0.000					

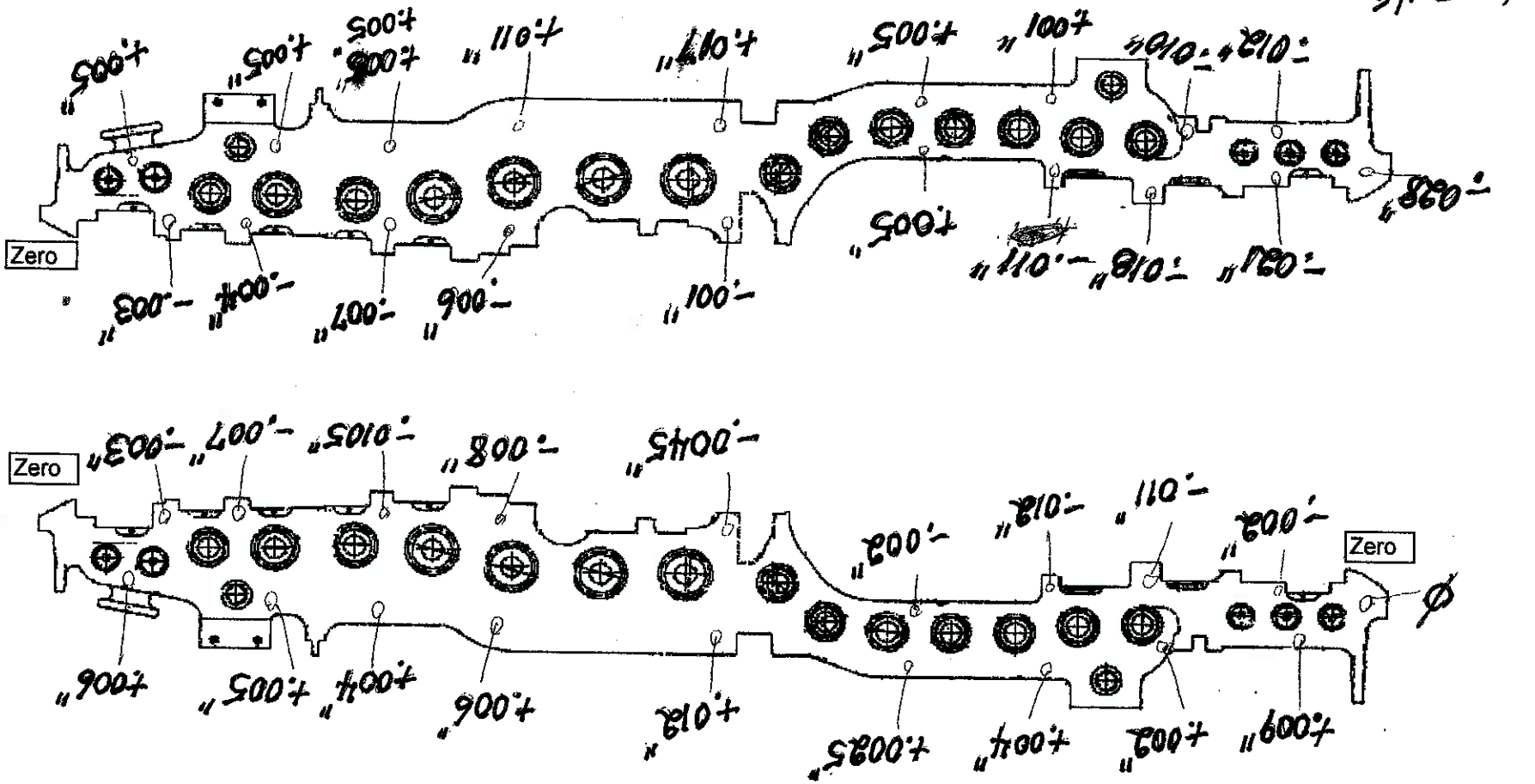
H P Inner Shell Mitchell Unit # 2
Laser Horizontal Joint Flatness Check





Readings taken at AEP CMS Charleston W.Va.
09-27-05 by Vince Kollin & Craig Schmotzer

AEP Mitchell Unit # 2
HP Inner Shell Upper Half
Horizontal Joint Flatness
Check W/ Hamar Laser



End of Report