A Century of Firsts

Mitchell Station Unit #1

American Electric Power Company

Ohio Power Company

A unit of American Electric Power

Westinghouse T-G Set

800 MWs - Tandem Compound - 3600 rpm

VHP-HP Turbine	Serial Number	13A3160-1
IP Turbine	Serial Number	13A3161-1
LP Turbine #1	Serial Number	13A3162-1
LP Turbine #2	Serial Number	13A3163-1
Turbine Instruction Book		1250-C679
Generator	Serial Number	1-S-87P0755
Brush Collector	Serial Number	1-S-94P0063
Generator Instruction Book		90P0944
Brush Collector Instruction Book		1560-0093
Boiler Feed Pump Drive Turbine		15-A-2961-1
BFP/DT Instruction Manual		1150-C129
Spring Outage		4-1-2006 to 6-18-2006

Table of Contents

Executive Summary

Mitchell Station Unit 1 was removed from service on Friday, 4/1/06 for a scheduled ten-week outage. The primary scope of the work included an inspection of the IP double flow turbine element (2nd Reheat) and the HP main steam flow valves.

RSO crews teamed with CMS personnel performed the inspection work during the outage. See below for the key personnel for the outage. All work was completed by 6/10/06, and the unit was released to the system on 6/18/06 after a successful start-up.

A brief summary of the work completed by the RSO and CMS crews during the outage is as follows:

- Disassembled/reassembled the double flow intermediate pressure turbine element
- Disassembled/reassembled the collector end electric generator casing end bell and hydrogen seal gland
- In-Situ inspection electric generator field rotor and stator
- Overhaul four main turbine stop valves
- Overhaul eight main turbine control valves
- Gasket replacement of the right side 1st reheat stop valve bonnet
- Cleaning of the main turbine lubrication oil coolers
- Cleaning of electric generator hydrogen seal oil skid coolers
- Cleaning of the electric generator stator water cooling skid coolers
- Cleaning of the EHC skid coolers and skid
- NDE inspection of the main unit low pressure turbine element(s) L-0 blading
- NDE inspection of the boiler feed pump drive turbine element L-0 blading.
- Replacement of BFPT drive coupling

Start-up of the main turbine occurred on 6/18/06. Less the vibration dampening at #11 bearing, all vibrations levels were acceptable to the plant personnel without field balancing for grid generation.

Resources

Internal

Steve Dolan	Mitchell Station	Process Owner – Electric
Jack Huggins	Mitchell Station	Rotating Equipment
Ralph Pederson	GET TSV TC	Lead Turbine Coordinator
John Powell	GET TSV TC	2nd Shift Turbine Coordinator
John Lackner	GET TSV Planning	Maintenance Planner
Ron Kline	GET TSV RSO	Supervisor – Turbine Crew
Jeff Brothers	GET TSV RSO	Supervisor – Turbine Crew
Doug Foster	GET TSV RSO	Supervisor – Turbine Crew
Doug Graley	GET TSV CMS	Non Destructive Examination
Jim Cable	GET	Eng'g Turbine Engineer

External

Federal Industrial	Sandblasting Services
Mannings	Bolt Induction Heating Consultation
Cincinnati Babbitt	Bearing Repairs
Schmidt Industries	Replacement Hi – Temp Fasteners
Shutler Machining	Shop Machining Services
Steam Turbine Alternative Resources	Steam Path Packing

WO Numbers

See Attached Following Three Pages

Main Unit **Tab 1**

IP Turbine Element

Rotor & Blading

This equipment inspection involved the removal of the existing operating rotor, TD 44176, and its replacement with an OEM refurbished rotor, TD 39415. New style blading in rows 2 and 3 of refurbished CI rotor required the placement of new J hook seal strips in the #1 blade rings (GVN & GNN). The existing seal strips were machined level with the blade ring bore ID. New grooves were machined into blade path bores approximately ¾" from the existing labyrinth grooves. The grooves were located by instructions on OEM provided drawings, included later. The placement of new seal strip grooves was due to a change of the shroud width. The new style blades were an integral shroud design with no need for riveted cover shroud.

Stationary Blading

The blade rings (1 & 2; GVN & GNN) were shipped to CMS.

The #1 blade rings (GVN & GNN) were grit cleaned and NDE inspected. New row 1 blade diaphragms were installed. The installed diaphragms were machined to OEM provided drawings. The new diaphragm shroud width due to machining resulting in a new "K" dimension for charting and setting the rotor axial location. The rotor was moved 0.040" toward the GVN. The movement matched up within 0.007" of using the plant stored "A" and "C" coupling spacers installed originally with this rotor train. The new rotor blading of rows 2 and 3 resulted in new axial readings for proper charting.

The #2 blade rings (GVN & GNN) were grit cleaned and NDE inspected. Several rows of required repair welding of hard particle erosion (see CMS Shop Report).

Centerline Alignment

The centerline alignment of the internal IP components was performed with the tops off. The lower blade ring transverse alignment pockets required weld patches to be applied to one side or the other and field dressing to restore pin to pocket clearances of 0.005". The blade ring elevations were corrected at the horizontal joint as necessary. These vertical alignments were minor of about 0.010". The clearances of the internal split line key features in their respected cylinder pockets were opened up as necessary per Siemens Bulletin Operations and Maintenance Memo 148 (Support Key Vertical Clearances).

Turbine Casings

The inner cylinder was grit blasted and NDE inspected in the field. The component halves ware found in good condition and required no repairs. The inner to outer cylinder floating seal rings were manually cleaned and verified for freedom of movement before installation.

The outer cylinder was grit blasted and NDE inspected. The component halves were found in good condition. The lower cylinder exhaust bowl struts and their seal welds were found cracked. These were repair welded using 7018-A1 electrodes after removing the fractured inconel seal.

The inlet flow guide was found distorted. Past reports showed this to be a pre-existing condition. There appears to have no change to this component.

Electric Generator

Rotor & Retaining Ring (see attached Columbus report)
Stator & End Turns (see attached Columbus report)

This was a rotor In-Situ inspection. See attachment for Columbus inspection report. All requested action items of this report were completed.

Hydrogen Glands

The collector end generator end bell and hydrogen gland casing were disassembled to investigate the cause of hydrogen side seal oil entering the stator coil cavity during generation operation. This disassembly aided the Columbus Engineering interior inspections. The disassembly aided the mechanical inspection of the hydrogen gland casing and seal ring for condition and possible cause of oil leakage to the coil cavity. Inspections of the seal ring and gland casing found nothing of real note other than visual scuffmarks on the seal ring axial faces as it aligned to the upper half gland. The large diameter taper alignment pin to the right side of the gland casing had physical mechanical distress marks on it. Shutler Machine produced a new pin to replace the damaged item. Precision measurements of the gland casing and seal ring found clearances in expected acceptable conditions. The reassembly of the hydrogen gland casing and the end bell halves resulted in no greater than a 0.001” step at the horizontal joints.

The investigation of the oil egress into the coil cavity continued with the removal of inspection covers on the end bell defoaming tanks at each end of the generator. These tanks were found relatively clean with no foreign debris. The oil drain lines were inspected with a borescope camera back to the loop seal tank and nothing was found. The loop seal tank was drained and hand valves removed to visually inspect interior for debris; none found.

Gland Seal Oil Skid

The air side and hydrogen side seal oil positive displacement pumps were shipped out for refurbishment at RPM. The air side pump after system testing required its bearing flanges shipped to Shutler Machine to establish “O” ring grooves to seal the heavy leakage from these mechanical joints.

The air side seal oil cooler(s) cooling water return loops were shipped to Shutler Machine to repair erosion damage at the lantern ring and “O” ring fit areas. These repairs (field drawings attached later) were necessary to return to the original seal techniques without use of RTV compound and other fixatives, which interfere with the movement of the cooler floating head.

Brush Collector Rotor

Alignment

The collector rotor was elevated at the #11 bearing to put a 0.003” gap at the bottom of the coupling. This gap is a deviation from the Siemens technical manual for this aftermarket equipment. The gap was established to put additional loading on the #11 bearing thus reduce the high vibrations being experienced during operation. The rotor was then put through a swing check to assure the outboard end of the rotor ran a crank of no more than 0.005” TIR with the coupling bolts at expected torque values. The TIR was 0.003” with torque values no more than 2400 foot-pounds and no less than 2000 foot-pounds.

This alignment activity above reduced the vibration energy when the rotor rolled through its critical speed, but the at speed vibration levels are above 6 mils. Operations continues to dampen this energy by controlling the hydrogen side seal oil and air side seal oil supply temperatures at a differential spread of approximately 30 degrees Fahrenheit. Operations has found this technique dampens the collector shaft vibration, at issue with this technique is the mechanical twisting of the brass/babbitt seal ring thus inhibiting the OEM intended floating in its gland casing groove. Operations have been using this technique since the brush collector installation. This twisted ring condition is a source of concern for seal oil entering the generator coil cavity. The amount of oil entering the collector end of the generator varied from shift to shift during the start up from barrels down to gallons per shift. The seal oil skid operation was reviewed and adjusted without much success. A thermograph review to the hydrogen side seal oil regulating tank showed it and the receiver tank full with hot return drain oil backed up the line toward the generator end bell defoaming tanks. The regulating tank appeared to not be operating properly. A boiler outage a short while later provided an opportunity to investigate the regulating tank float valves (see attached report). The adjustment of the float valve(s) dead band brought the seal oil entering the generator during operation down to four ounces per shift.

Pedestals & Couplings

Pedestal #1

Main Oil Pump

The front standard was disassembled to allow correction of experienced high main oil pump seal ring wear. The brass seal rings were fretting to destruction. The fretting activity had damaged the seal ring grooves of the pump housing. This work order removed the stub shaft and its mounted oil pump impellor from the HP rotor element-coupling flange. The stub shaft was shipped to CMS for inspection and repair. The stub shaft was disassembled to its smallest components and inspected (see CMS Shop Report). The stub shaft was reassembled and the impellor nut torqued to 1000 foot-pounds. The rotor was then checked for runout and the operational seal lands precision ground. The stub shaft was remounted to the HP turbine element pulling the coupling flange bolts to 600 foot-pounds. The swing test of the stub shaft revealed a TIR of 0.002".

The pump housing seal grooves required weld repair and dimensional restoration. This required the parting of the suction and discharge pump lines below the concrete pier after cutting openings into the guard pipe. The removed pump housing base and cover were shipped to CMS for weld repair and machining (see CMS Shop Report). The sealing shim rings between the pump housing feet and the oil pedestal floor were replaced with split ring components to allow future elevation changes as needed without cutting supply and discharge piping. The thickness of the shim rings was cut to set the housing bore central to the pump impellor. This required lowering the pump housing 0.105" from as found. Field drawing of Shim Ring Detail attached later.

Oil Deflector

The oil deflector was removed to allow installation of the rotor jack during the rotor and shell movements needed to correct the "A" coupling alignment. The labyrinths were found in good condition but large diameter. The seal at reassembly was gapped 0.006" at the bottom and even at the sides.

Bearing #1

The tilting pad bearing sleeve was found in good condition. It was disassembled to support correction of HP element to the 2nd reheat IP element coupling alignment. Alignment is accomplished by changing dimension changes of the pucks between the bearing shell and babbitt pad. Upper pad clearances were restored after alignment completion.

IP Pedestal #2-#3

Oil Deflectors

The oil deflectors were removed to allow installation of the rotor jack during the rotor and shell movements needed to correct the “A” coupling alignment. The #2 labyrinths were is good condition. The #3 labyrinths were found with excessive clearance and thus repaired at CBI. The deflectors at reassembly were gapped 0.005” to 0.006” at the bottom and even at the sides.

Bearing #2

The tilting pad bearing sleeve was found in good condition. It was disassembled to support correction of HP element to the 2nd reheat IP element coupling alignment. Coupling alignment is accomplished by changing dimensions of the pucks between the bearing shell and babbitt pad. Upper pad clearances were restored after alignment completion.

Bearing #3

The tilting pad bearing sleeve was shipped to Cincinnati Babbitt Inc to apply new babbitt to the pads for the replacement rotor journal. The rework of the pads also eliminated spalled babbitt edges. The pads were blued checked to a mandrel before setting the top pad(s) clearance to the rotor. The upper bearing pad(s) to journal clearances to corrected to design. Coupling alignment is accomplished by changing shims of the bearing shell outer spherical pads to the pedestal saddle.

IP Pedestal #4

Oil Deflector

The #4 oil deflector was removed to allow removal of the rotor for the outage inspection. The labyrinths were found with excessive clearance as compared to the replacement rotor and thus repaired at CBI. The deflector at reassembly was gapped 0.005” to 0.006” at the bottom and even at the sides.

Bearing #4

The tilting pad bearing sleeve was shipped to Cincinnati Babbitt Inc to apply new babbitt to the pads for the replacement rotor journal. The rework of the pads also eliminated spalled babbitt edges. The pads were blued checked to a mandrel before setting the top pad(s) clearance to the rotor. The upper bearing pad(s) to journal clearances to corrected

to design. Coupling alignment is accomplished by changing shims of the bearing shell outer spherical pads to the pedestal saddle.

Rotor Coupling "A"

The alignment of the HP element to the 2nd reheat IP element required the dropping the #1 bearing sleeve and the GVN of the HP shell to bring it into circular letter expectations. Difficulty was encountered developing repeatable sixteen point face readings. The most reliable repeatable readings were found taken at the rotor(s) spigot faces rather than the highly polished coupling head(s) friction surfaces.

Rotor Coupling "B"

The coupling heads were inspected and found in good condition. This coupling assembles without axial spacer.

Rotor Coupling "C"

The assembled 2nd reheat IP rotor element and jackshaft required very little movement of the #3 and #4 bearing sleeves to bring the "C" coupling to within circular letter expectations.

Main Turbine Steam Flow Valves

Main Stop Valves (4)

The valve bonnets were jacked out of their steam chests with difficulty due to oxide scale build up. This resulted in a number of jack bolt threads being damaged to complete the activity. The bonnets after valve plug removal were shipped to CMS to repair these threads. CMS installed double threaded sleeves as a repair. CMS at this time installed the fine mesh screens to the bonnet strainers. The fine mesh screens were stitch welded to the strainers. See CMS Shop Report.

Valve bonnets 2 and 4 required replacement of the backseat bushings due to damage in the backseat face. CMS completed the removal and installation of these items.

The valve plugs were disassembled down to their finest components. Two valve main plugs were replaced. A number of new parts were put into the four valve plug assemblies to complete the inspection and overhaul. The rebuild of the plug assemblies re-established the required component travels of the valves from the interior pilots to the stem themselves. The actuator dashpots were checked and found adequate at the time these components were ganged to the installed valve assemblies, not linkage adjustment

was necessary. The Belleville washer compression was reviewed and adjusted as needed after the unit start up.

Control Valves (8)

The valve stands #4 and #6 were shipped to CMS to have the snout bushings reset, as these were pulled loose or cocked with respect to the stand itself at disassembly. Disassembly was hindered by oxide scale build up in the clearance between the steam chest bore and valve stand snout alignment interface. The stand #6 had a new snout bushing installed, as one was allowable. The #4 snout was pulled and reset. New bushings for the bushings should be in stock for the next valve inspection (quantity 8).

Many new parts were put in the valve plug and stem assembles to restore sliding clearances or the correct plug damage. The dashpot of the actuators were checked and corrected when the linkages were assembled. The Belleville washer compression was reviewed and adjusted as needed. Several washer trays needed washer correction.

Reheat Stop Valves (1st RHT RS)

The valve cover was removed to replace the failed flexitallic gasket. The component(s) sealing faces were found in good condition and did not require any repairs other than clean up. The gasket and cover were installed with the fasteners pulled to a 45KPSI preload using a torque wrench.

Drive Turbine

Pedestals & Couplings

The coupling between the drive turbine and the boiler feed pump was disassembled to the point of removing the coupling heads from both pump and turbine shaft. It was intended to install a new style coupling but was found not ready for this outage. The source of issue was an incorrect spool piece between the coupling heads.

The shaft fit areas and the old coupling head components were inspected for correct geometry and NDE'd for evidence of crack propagation, none found. The pump coupling head ID was blued to the shaft with good contact evident. The coupling heads were heated and put on with proper advance.

The GVN pedestal fasteners were removed one at a time and RTV sealant applied to the heads to eliminate an oil seepage path.

The EHC piping gas filled accumulators were recharged with nitrogen gas to resolve system behavior issues. No data was found as to when the Viton bladders were last changed out. Nothing more was heard about these during start up.

Miscellaneous Inspections **Tab 2**

Columbus AEP Generator Report	(2 Pages)
CMS Work Performed Report	(103 Pages)
MOP Pipe Weld Traveler	(9 Pages)
Siemens Vibration Report	(21 Pages)
Mitchell Boiler Outage	(19 Pages)

Mitchell 1 Generator Inspection
April 6, 2006

Unit 1 generator was inspected with the rotor in place. The turbine end was entered via the riverside access cover, on the side of the generator. The collector end upper half enedbell was removed. The single bushing well access cover was removed to allow for its inspection.

Generally the generator was in good condition. Heavy oil contamination was observed on the collector end. The turbine end had a light coating of oil.

Items Recommended For Completion During The 2006 Outage

Collector End Of The Stator

1. Wipe the end turns with solvent dampened rags to remove the oil.
2. Wipe the collector end water hoses with dry rags to remove the oil drippings.
3. Investigate the water header supports at the 1:00 and 11:00 o'clock positions. Check the tightness of the locked tabbed bolts and tighten as required. Clean off the greasing on the surface of the water header supports.
4. Vacuum up the paint chips at the top of the stator. They are mostly concentrated between the bars next to the core.

Equalizing Line

The stator water equalizing line, which runs from the collector end to the turbine end is scheduled for replacement during this outage.

A new line will be run parallel to the existing line. The existing line will be retired in place.

Present plans are to fabricate a new line outside of the generator stator and complete the final two welds in the stator.

Support of the new line is planned to be by using epoxy saturated glass roving around the new line, existing retired line and the larger diameter gas distribution pipe in the top of the stator. Note: The larger diameter gas distribution pipe has holes drilled on the side. These are at approximately the 5:00 o'clock position when facing the collector end of the generator. Dacron epoxy saturated felt should be used to pad the new line, old line and gas distribution line.

To provide greater airflow during the welding and epoxy loaded material installation, remove the second cover on the turbine end, opposite the cover already removed.

A small person will be required to install the epoxy materials in the top of the generator stator.

Consideration should be given to installing the new line between the old equalizing line and the gas distribution pipe.

Bushing Well

The angled bushings have deep puddles of oil at their bases. Generally the bushing well is very oily. The oil needs wiped up and the interior of the bushing well needs wiped with clean rags.

Collector Rings and Brush Rigging

Clean the flyash and carbon deposits from the brush supports. Clean the base area of the collector rings and brush rigging.

Generator Rotor

At the collector end, clean the accessible dust and oil out from under the retaining ring.

Megger the generator field with 50 vdc for ten minutes, when all repairs are completed.

Generator CT's

The generator CT area is coated with flyash and dirt. Wipe the CT's and supports off with solvent dampened rags.

While in the area, change the Isophase bus air intake filter. It is very dirty.

Collector Ring Dog House

1. Wipe down the interior of the doghouse to remove the oil, carbon dust and flyash.
2. Clean off the oil and flyash on the exterior of the doghouse, at the shaft entrance area.
3. Replace the filters on the top of the exciter doghouse.

Steve Ridenbaugh
AEP-Columbus
200-1465

Dan Shriver
AEP-Columbus
200-2138

AMERICAN ELECTRIC POWER

DATE: July 20, 2006

SUBJECT: MITCHELL PLANT UNIT 1
PLANNED SPRING 2006 OUTAGE

FROM: B. K. Mabe – Central Machine Shop

TO: W. L. Irons / C. W. George – Mitchell Plant

Attached is a report concerning the work CMS performed during this planned spring Unit 1 outage. If you have questions concerning the report or require additional information, please contact me.

C: D. J. Sculley – GET Engineering
File – CMS

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 1

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT

LOW PRESSURE "A" AND "B" TURBINE ROTORS

Magnetic particle (wet fluorescent) inspection of the last stage blades (L-0 Stage) on the "A" and "B" low pressure turbine rotors revealed no defect indications (cracks) are present on the rotors

BEARINGS

Ultrasonic inspection of the T-3, T-4 and T-11 bearings housing to babbett bond revealed a satisfactory bond on all three bearings.

STUD BOLTS

Ultrasonic inspection of the 2rh. turbine outer shell stud bolts revealed no defect indications (cracks) are present.

Ultrasonic inspection of the 2rh turbine inner shell studs revealed no defect indications (cracks) are present.

Ultrasonic inspection of the 2rh turbine packing gland studs revealed no defect indications (cracks) are present.

Ultrasonic inspection of the four throttle valve studs revealed no defect indications (cracks) are present.

Ultrasonic inspection of the eight governor valve studs revealed no defect indications (cracks) are present.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 2

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

FLOW GUIDE BOLTS

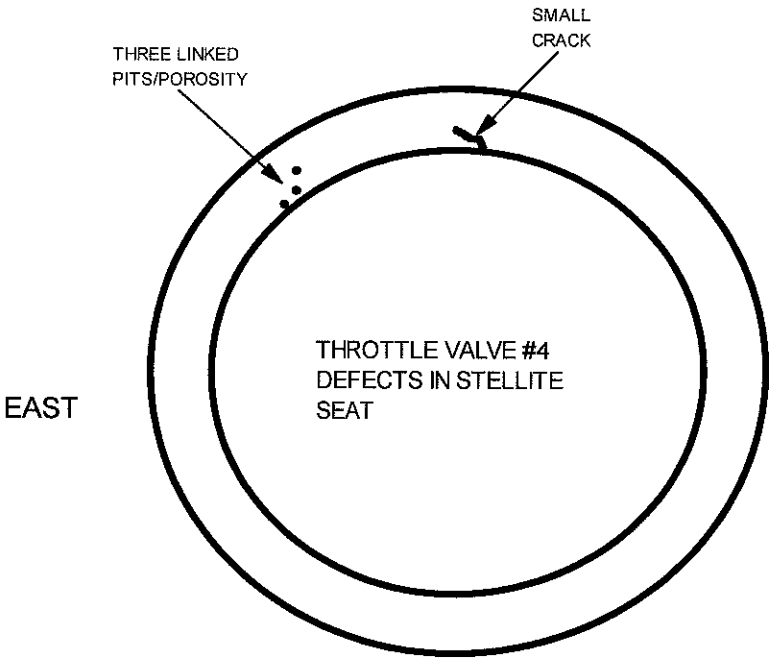
Ultrasonic inspection of the low pressure "A" turbine and low pressure "B" turbine steam flow guide bolts revealed no defect indications (cracks) are present.

VALVES

THROTTLE VALVES

Visible dye inspection of the four throttle valve stellite seats revealed no defect indications (cracks) are present in valves # 1, 2 and 3. Valve #4 has one small crack and, in another location, has three pits (porosity) that are linked together.

MITCHELL PLANT UNIT 1
SPRING 2006 OUTAGE



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 3

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

THROTTLE VALVES (CONTINUED)

Magnetic particle inspection of the inside and outside of the four (4) throttle valve bodies revealed no defect indications (cracks) are present.

GOVERNOR VALVES

Magnetic particle (wet fluorescent) inspection of the governor valve chests (2) revealed no defect indications (cracks) are present. The non-stellite governor valve seats have visual areas of erosion in the seat area. There is a ¼" crack on the bypass pipe weld to the flange and a ¾" long crack on the flange face outlet hole.

Magnetic particle (wet fluorescent) inspection of the governor valve stands revealed one with an 1\8" to ¼" long crack beside the rabbit fit on the inside section of the stand.

HAND SHUT OFF VALVES

Magnetic particle (wet fluorescent) inspection of the hand shut off valve welds revealed the following:

- 12th Floor – Penthouse 5R vent valve – 2 welds – No defect indications (cracks)
- 12th Floor – Penthouse 6L vent valve – 2 welds –No defect indications (cracks)
- 11th Floor – Drain Valve 11R –3 welds – No defect indications (cracks)
- 11th Floor – Drain valve 12R – 3 welds – No defect indications (cracks)
- 11th Floor – Drain valve 13R – 2 welds – No defect indications (cracks)
- 11th Floor – Drain valve 14R – 2 welds – No defect indications (cracks)
- 11th Floor – Drain valve 13L – 2 welds – No defect indications (cracks)
- 11th Floor – Drain valve 14L – 2 welds – No defect indications (cracks)
- 11th Floor – Drain valve 7L – Inside Penthouse – 1 weld – No defect indications (cracks)
- 7th Floor – Drain valve 19R – 4 welds – No defect indications (cracks)
- 5th Floor – Drain valve 25R – 3 welds – No defect indications (cracks)

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 4

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

HAND SHUT OFF VALVES (CONTINUED)

- 5th Floor – Drain valve 25R – 3 welds – No defect indications (cracks)
- 5th Floor – Drain valve 25L – 2 welds – No defect indications (cracks)
- 5th Floor – Drain valve 29L – Inside boiler – 1 weld – No defect indications (cracks)
- 5th Floor – Drain valve 29R –2 welds – No defect indications (cracks)
- 5th Floor – Drain valve 30R –2 welds – No defect indications (cracks)
- 5th Floor – Drain valve 30L –2 welds – No defect indications (cracks)

Magnetic particle (wet fluorescent) inspection of hand shut off valve 32R welds (2) revealed no defect indications (cracks) are present.

DRAIN LINE WELD REPAIRS

Magnetic particle inspection of the following drain line weld repairs revealed the following:

- Pass 5 to 6 bottle drain – Coupling weld repairs just outside of boiler – No defect indications (cracks) are present.
- #3 Main Stop Valve – Below seat drain line – Weld repair to the west side of 1st hand shut off valve – No defect indications (cracks) are present.
- #31L Boiler Drain – Inspection of welds on one (1) hand shut off valve and 1 butt weld on the outside of the boiler at the "T" above small expansion joint and two (2) 1" line welds on the inside of the boiler revealed no defect indications (cracks) are present.

2ND REHEAT STEAM LINE

Magnetic particle inspection of the **cover pass weld on the gamma plug** revealed no defect indications (cracks) are present.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 5

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

DEAERATOR

Magnetic particle (wet fluorescent) inspection of the deaerator circumferential (all) welds on the outside of the deaerator, the inlet lines welds, the outlet lines welds, the small lines welds, the stiffner leg support welds, the pressure relief valve welds and manway welds revealed no defect indications (cracks) are present.

Magnetic particle (wet fluorescent) inspection of the deaerator pad weld at the outside northeast corner revealed no defect indications (cracks) are present.

Magnetic particle inspection of the deaerator next to last circumferential weld and the seam weld between the next to last and last hemi head circular weld in the back end of the deaerator revealed the weld has eroded away on a 18" long area of the circular weld on the south wall. This was a previously weld repaired area.

Magnetic particle (wet fluorescent) inspection of the welds inside of the deaerator in an area toward the backside of the deaerator revealed the following:

- #5 -- Donut weld at back pipe – No defect indications (cracks) are present.
- #3 -- Circumferential weld at back hemi head – No defect indications (cracks) are present.
- #6 -- Big line weld at center buck – No defect indications (cracks) are present.
- #2 & #8 -- Hemi Head pad welds – No defect indications (cracks) are present.
- #10 -- Arc strike – No defect indications (cracks) are present.
- #11 -- Arc strike – No defect indications (cracks) are present.
- #12 -- Arc strike – No defect indications (cracks) are present.
- #13 -- Arc strike – No defect indications (cracks) are present.
- #15 – Two (2) small 90° welds at the south wall – No defect indications (cracks) are present. Two (2) top 4" pipe welds – No defect indications (cracks) are present. Two(2) 14" pipe welds at south wall – No defect indications (cracks) are present.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 6

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

DEAERATOR(continued)

- #1 Pad weld at northeast lower wall has a area with cracks.
- Magnetic particle inspection of the circumferential weld repair on the inside and outside of the deaerator on the south wall revealed no defect indications (cracks) in the weld repairs.
- Magnetic particle inspection of the outside cover pass on two 14" heater drains where they go through the shell wall revealed both welds are free from defect indications (cracks).
- A section of plate was removed from the south east corner of the deaeerator was reinstalled and a magnetic particle inspection of the welds cover pass on the inside and outside revealed no defect indications (cracks) are present. A entry door was installed into the section of plate and a magnetic particle inspection revealed no defect indications (cracks) are present in the inside and outside root, and cover pass welds.

HEATERS

Magnetic particle (wet fluorescent) inspection of the #1 low pressure heater shell revealed no defect indications (cracks) in the inside circumferential welds, the inside seam welds, the inside inlet nozzle welds and the inside spray nozzle welds.

Ultrasonic inspection was performed to the inlet nozzles to determine wall thickness. The inspection was started at the back nozzle and moving to the front. Approximately

Ten (10) thickness readings at each location revealed the following:

- Back nozzle – Pipe thickness -- .493" to .565".
- Back nozzle - - Shell part of nozzle -- .625" to .795".
- 2nd nozzle – Pipe thickness -- .475" to .580"

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 7

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

HEATER INLET NOZZLE THICKNESS READINGS(continued)

- 2nd nozzle – Shell part of nozzle -- .619" to .782"
- 3rd nozzle – Pipe thickness -- .419" to .567"
- 3rd nozzle – Shell part of nozzle -- .642" to .793"
- 4th nozzle – Pipe thickness -- .427" to .558"
- 4th nozzle – Shell part of nozzle -- .637" to .802"
- 5th nozzle – Pipe thickness -- .429" to .508"
- 5th nozzle – Shell part of nozzle -- .682" to .793"
- Front nozzle – Pipe thickness -- .489" to .528"
- Front nozzle – Shell part of nozzle -- .693" to .728"

Magnetic particle inspection of the #1 low pressure heater front heater shell circumferential weld where a small "C" shaped section was cut from the shell for alignment purposes revealed no defect indications (cracks) are present after weld repair was completed. The root pass, halfway out and the cover pass welds were inspected when the shell segment was weld back into place.

BOILER FEED PUMP TURBINE

Ultrasonic inspection of the boiler feed pump turbine rotor shaft from the pump end to the governor end revealed no defect indications (cracks) are present

Magnetic particle (wet fluorescent) inspection of the boiler feed pump turbine rotor pump end and governor end L-0 blades revealed no defect indications (cracks) are present.

Magnetic particle(wet fluorescent) inspection of the boiler feed pump couplings and coupling covers revealed no defect indications (cracks) are present.

PRIMARY AIR FAN

Magnetic particle inspection was performed to the outboard bearing journal on the fan shaft and no defect indications (cracks) are present.

MAIN OIL PUMP LINES

Magnetic particle (wet fluorescent) inspection of the main oil pump suction and discharge leg welds revealed no defect indications (cracks) are present.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

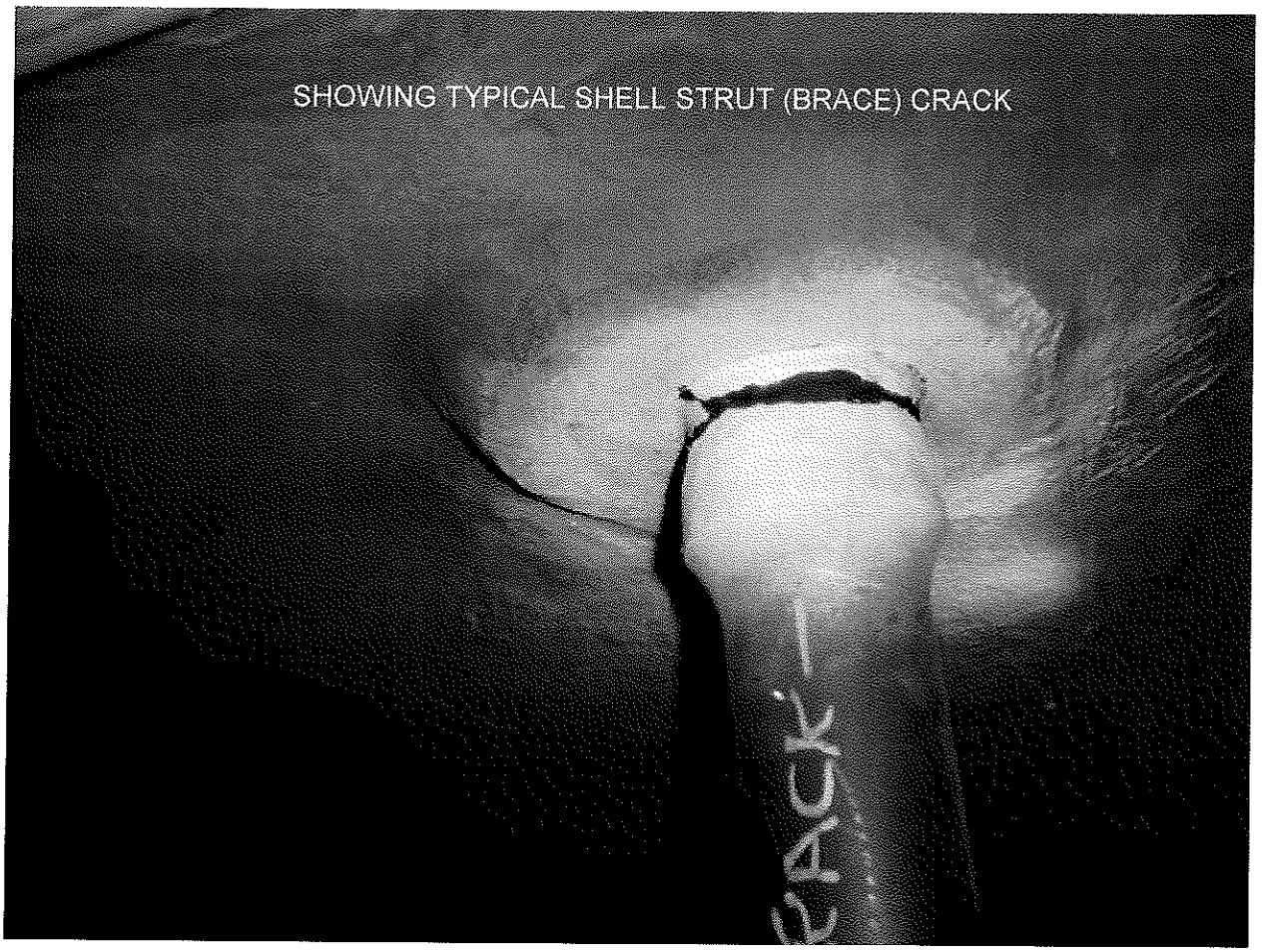
PAGE 8

JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

SECOND REHEAT TURBINE OUTER LOWER HALF SHELL

Visible dye inspection of sixteen (16) stiffener brace welds revealed twelve (12) of the brace welds have cracks. The 1-1/4" to 1-1/2" long cracks were ground and weld repairs to the 12 cracked welds was completed. A follow up visible dye inspection revealed no defect indications (cracks) remain after weld repair.



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 9

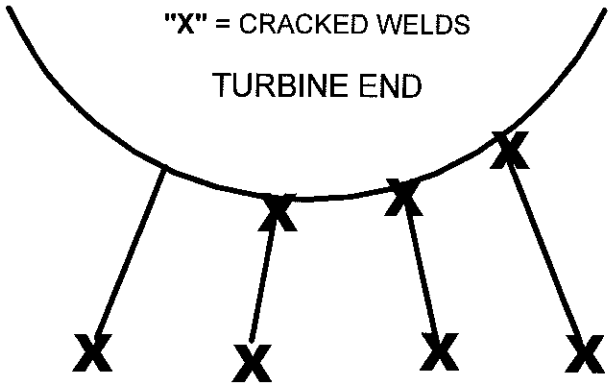
JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

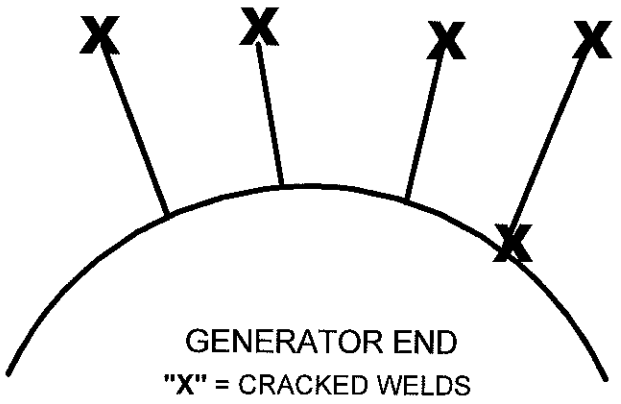
SECOND REHEAT TURBINE OUTER LOWER HALF SHELL(continued)

The following is a sketch showing the location of the twelve (12) cracked welds on the eight (8) stiffener braces:

MITCHELL PLANT UNIT 1
SPRING 2006 PLANNED OUTAGE



2ND REHEAT TURBINE SHELL LOWER HALF SUPPORT BRACES (STRUTS)



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 10

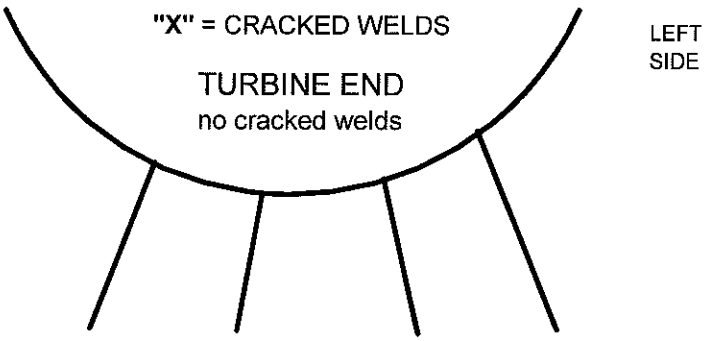
JULY 20, 2006

NDE INSPECTIONS PERFORMED AT MITCHELL PLANT(continued)

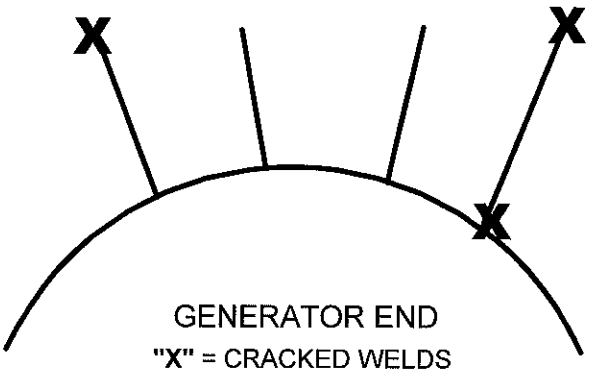
SECOND REHEAT TURBINE OUTER UPPER HALF SHELL(continued)

The following is a sketch showing the location of three (3) cracked welds of 16 welds on the eight (8) stiffener braces:

MITCHELL PLANT UNIT 1
SPRING 2006 PLANNED OUTAGE



2ND REHEAT TURBINE OUTER SHELL UPPER HALF SUPPORT BRACES (STRUTS)



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 11

JULY 12, 2006

OUTAGE WORK PERFORMED @ MITCHELL PLANT BY CMS

SECOND REHEAT TURBINE OUTER SHELL SUPPORT STRUTS (BRACES) (CONTINUED)

CMS personnel traveled to Mitchell Plant and ground to remove cracks from the second reheat turbine outer shell support struts. The ground areas were weld repaired. After welding was completed a visible dye inspection of the welded areas revealed no defect indications (cracks) are present.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 12

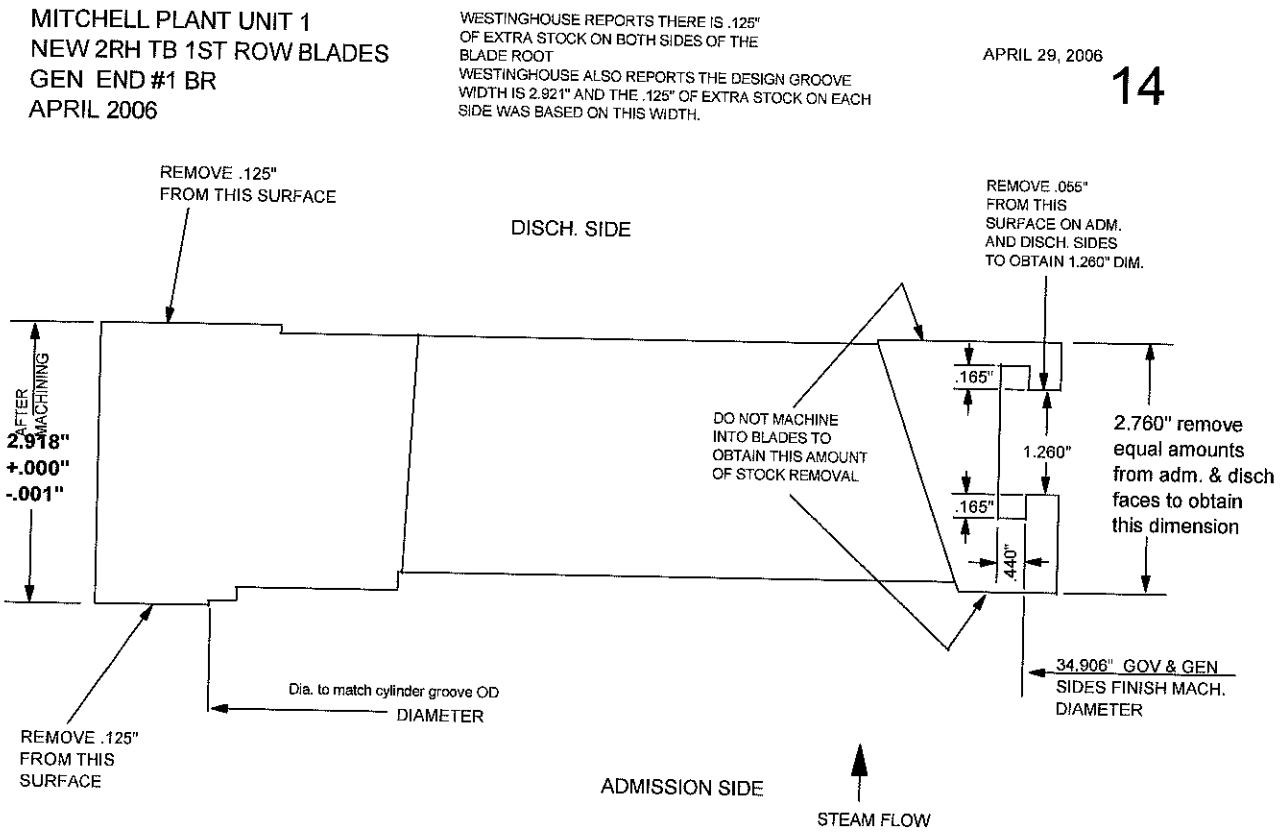
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS

#1 BLADE RING

The #1 and #2 governor and generator end blade rings were transported to CMS where the following tasks were performed:

- The row 1 blades governor and generator end were removed and new row 1 blades were installed and machined to the correct configuration and dimensions.



FINISH MACHINING DRAWING FOR GOV. & GEN ENDS OF MITCHELL PLANT UNIT 1 2ND REHEAT TURBINE STATIONARY 1ST ROW BLADES APRIL 29, 2006

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 13

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

#1 BLADE RING (CONTINUED)

- The governor and generator end 1st stage blades were removed, new blades were installed and machined.
- Impact damage and eroded areas in the 2nd and 3rd stage blade vane sections were repaired by straightening and welding. The welded areas were finish ground and all blades were NDE inspected after repairs. These inspections revealed no defect indications (cracks) remain.
- The #1 blade ring upper half was set on the lower half and dimensions were taken and recorded. The upper and lower halves were then bolted together and dimensions were taken and recorded to determine how the blade rings moved diametrically after being bolted as opposed to being free standing. See attachments below for dimensions.
- All seals were removed, new seals were installed and were machined to the correct diameters with the upper and lower half bolted together.
- The **row 2 and row 3 stationary seal grooves were moved** to make the blade ring(carrier) compatible with 2RH rotor TD 39415 which was installed during this outage. This rotor had modified blades installed at Siemens Westinghouse and requires a different seal configuration. The blade ring new seal grooves were machined per Siemens Westinghouse drawings 9D13676, 9D13686 and 9D13683 to change the location of the seals and establish the correct diameter for the seals.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 14

JULY 20, 2006

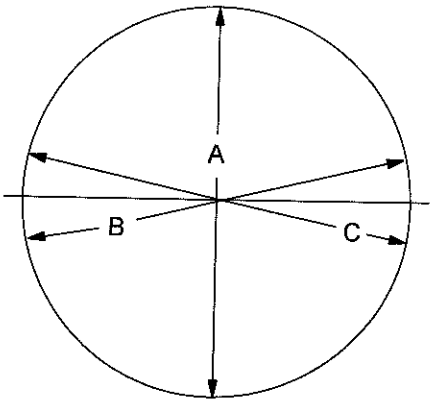
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

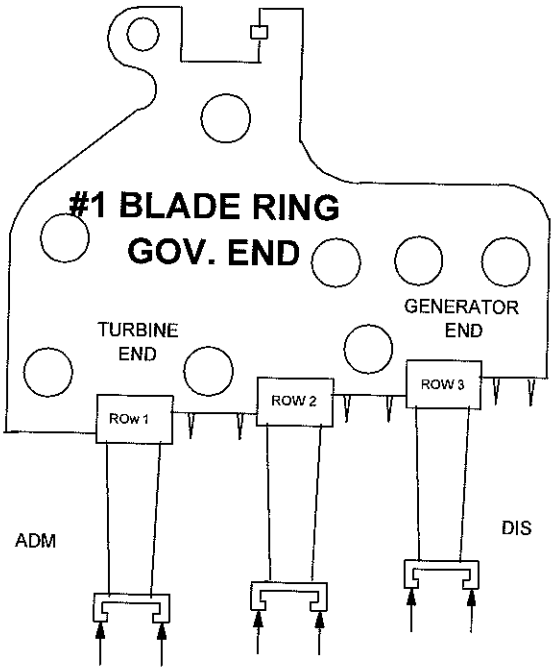
#1 BLADE RING (CONTINUED)

MITCHELL #1 GOV. END BLADE CARRIER

BOLTED	
UNBOLTED	X

	ROW 1		ROW 2		ROW 3	
A	34.449	34.444	36.324	36.337	38.225	38.241
B	34.441	34.445	36.351	36.368	38.258	38.291
C	34.441	34.432	36.328	36.356	38.257	38.286
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: May 3, 2006
TAKEN BY: Josh Duncan

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 15

JULY 20, 2006

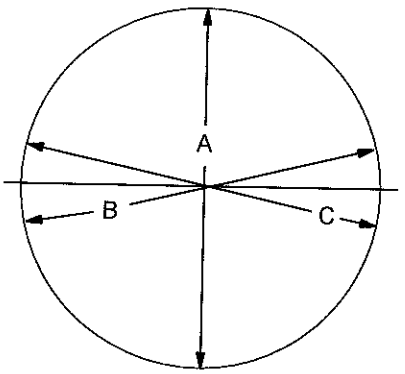
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

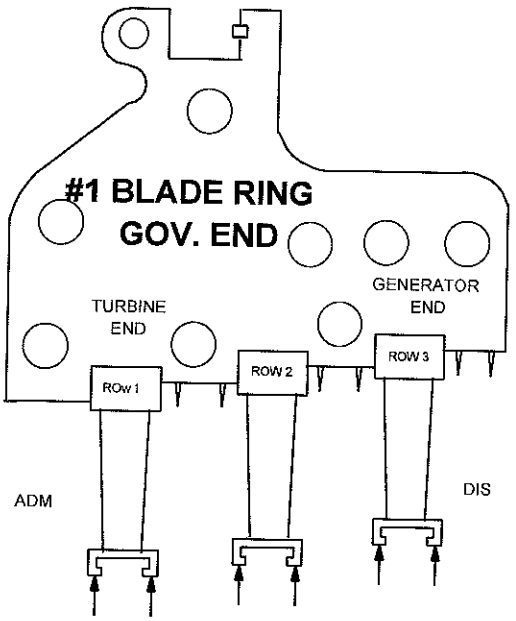
#1 BLADE RING (CONTINUED)

MITCHELL #1 GOV. END BLADE CARRIER

BOLTED	X
UNBOLTED	

	ROW 1		ROW 2		ROW 3	
A	34.420	34.425	36.304	36.318	38.202	38.226
B	34.423	34.428	36.345	36.362	38.251	38.283
C	34.433	34.433	36.347	36.347	38.245	38.275
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: May 3, 2006
TAKEN BY: Josh Duncan

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

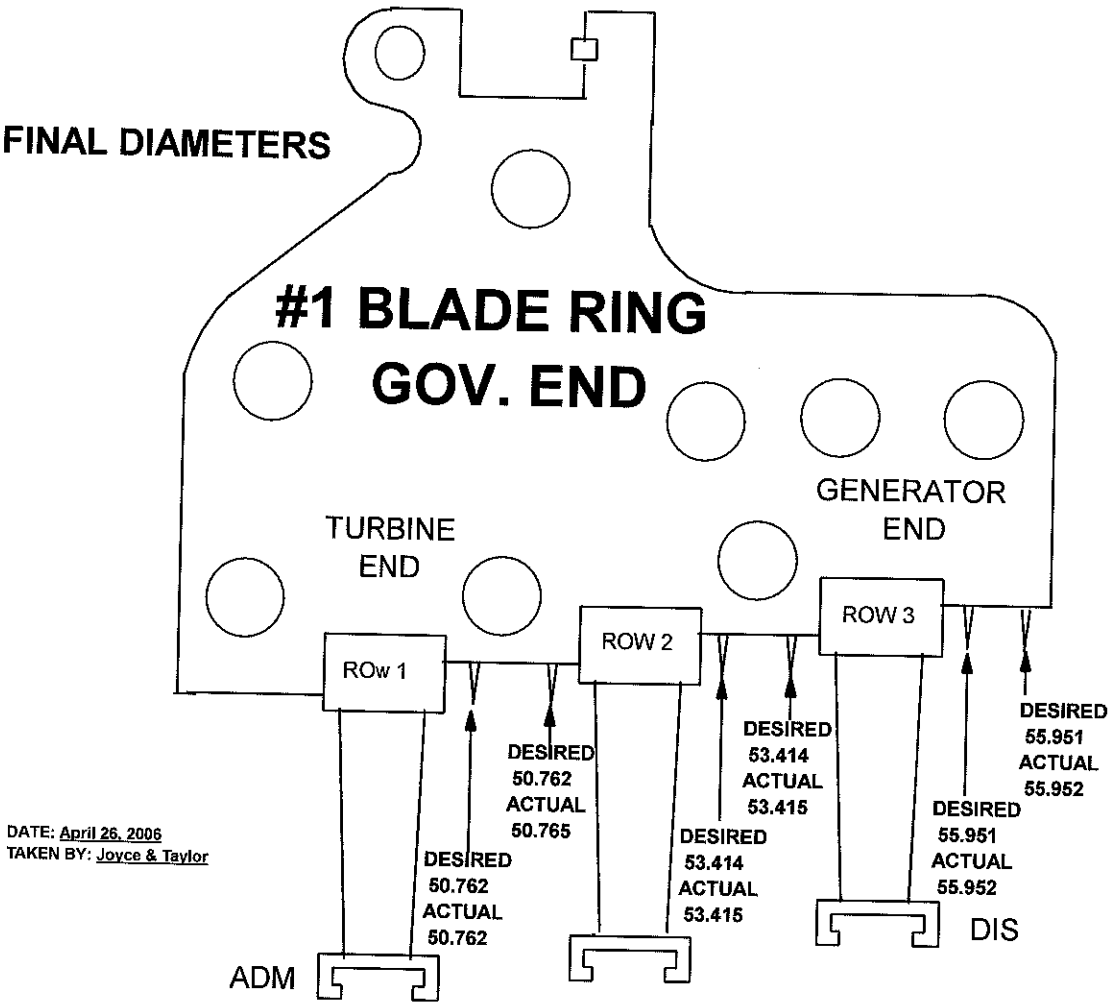
PAGE 16

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

#1 BLADE RING (CONTINUED)

MITCHELL U-1 #1 GOV. END BLADE CARRIER JULY 2006



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 17

JULY 20, 2006

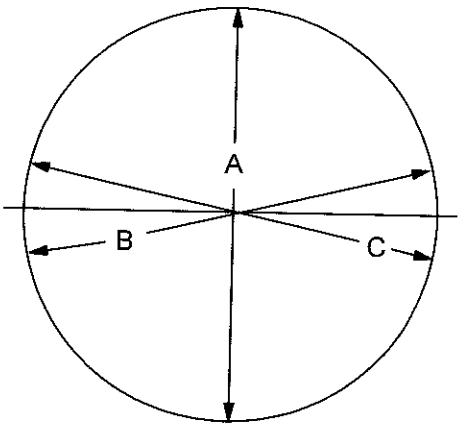
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

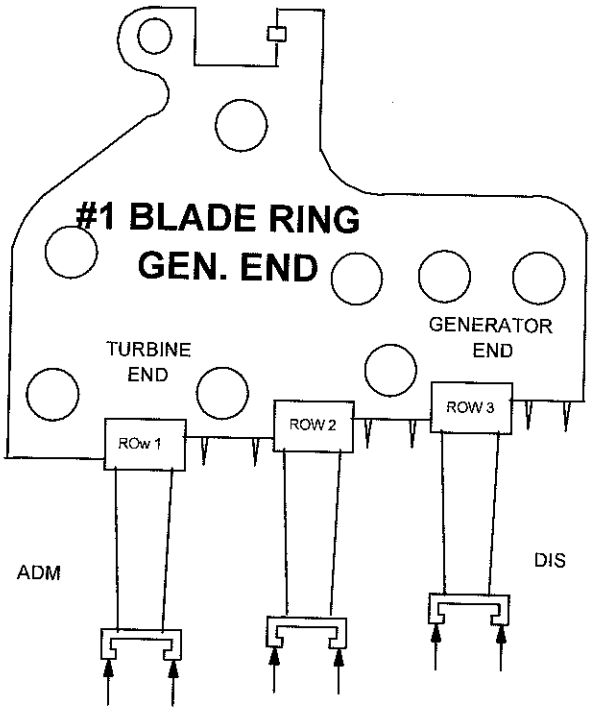
#1 BLADE RING (CONTINUED)

MITCHELL #1 GEN. END BLADE CARRIER

BOLTED	
UNBOLTED	X

	ROW 1		ROW 2		ROW 3	
A	34.405	34.406	36.299	36.280	38.211	38.196
B	34.405	34.406	36.327	36.305	38.254	38.219
C	34.405	34.406	36.342	36.318	38.251	38.224
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: May 3, 2006
TAKEN BY: Sam Halstead

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 18

JULY 20, 2006

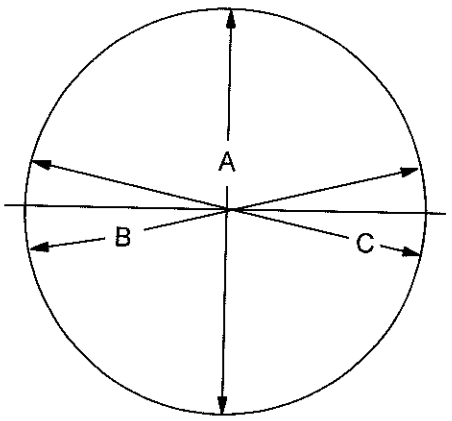
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

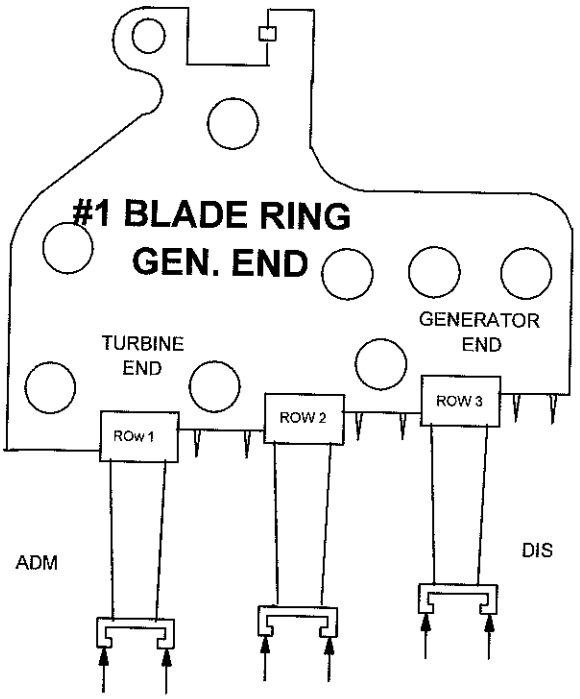
#1 BLADE RING (CONTINUED)

MITCHELL #1 GEN. END BLADE CARRIER

BOLTED	X
UNBOLTED	

	ROW 1		ROW 2		ROW 3	
A	34.404	34.406	36.293	36.279	38.202	38.191
B	34.404	34.406	36.325	36.307	38.252	38.222
C	34.405	34.406	36.338	36.319	38.246	38.223
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: May 3, 2006
TAKEN BY: Sam Halstead

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

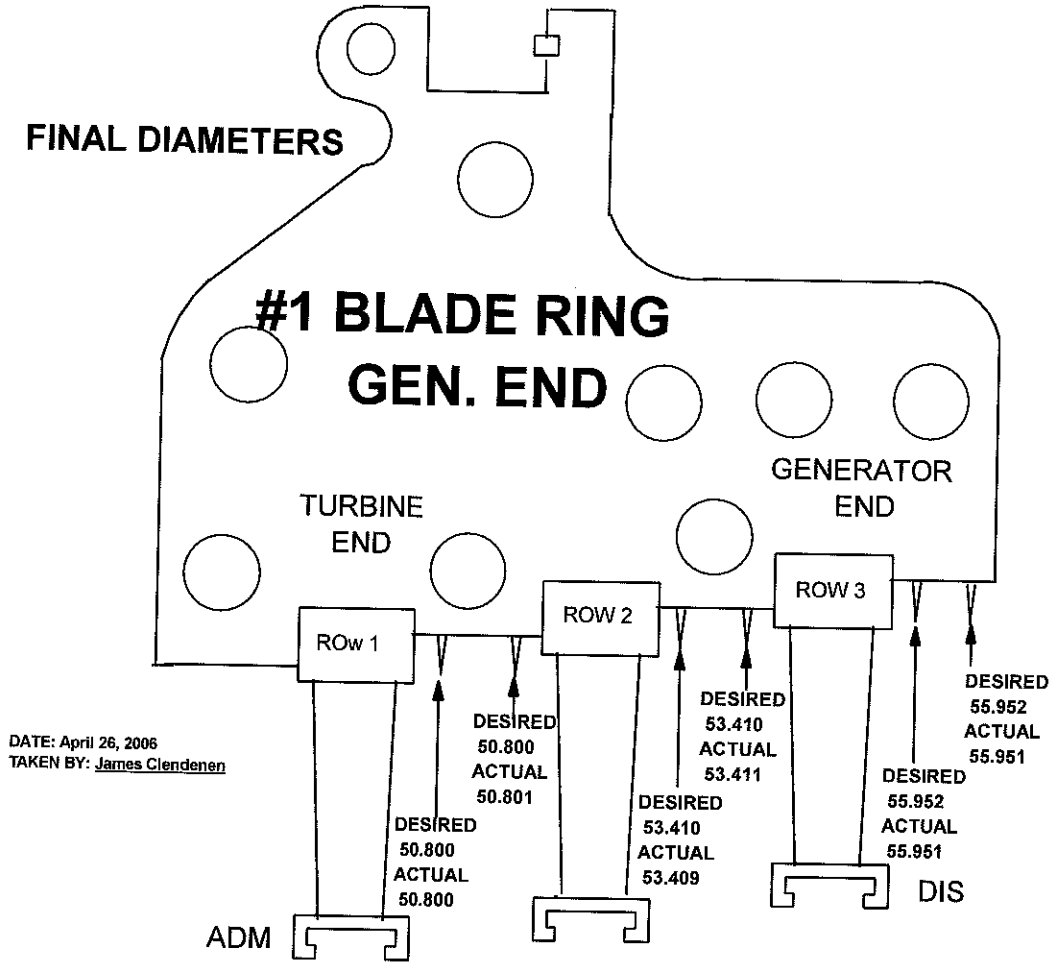
PAGE 19

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

#1 BLADE RING (CONTINUED)

MITCHELL U-1 #1 GEN. END BLADE CARRIER JULY 2006



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 20

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

#2 BLADE RING

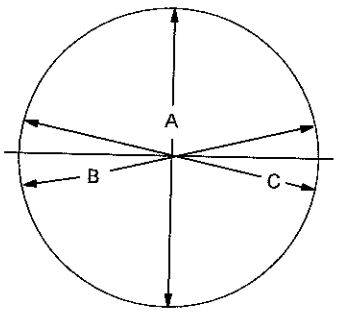
- Impact damage and eroded areas in the vane sections of all stages were repaired by straightening and welding. The welded areas were finish ground and all blades were NDE inspected after repairs. These inspections revealed no defect indications (cracks) remain.
- The #2 blade ring upper half was set on the lower half and dimensions were taken and recorded. The upper and lower halves were then bolted together and dimensions were taken and recorded to determine how the blade rings moved diametrically after being bolted as opposed to free standing dimensions. See attachments below for dimensions.
- All seals were removed, new seals were installed and the new seals were machined to the correct diameters with the upper and lower half bolted together.

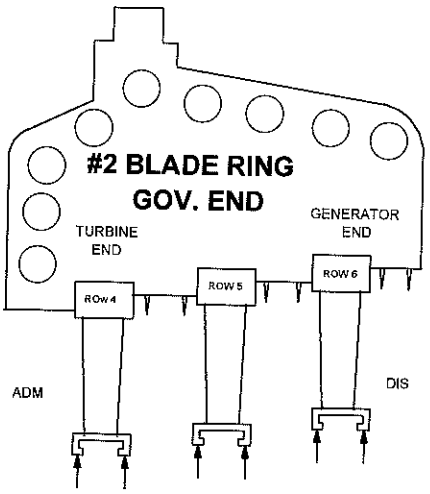
MITCHELL PLANT UNIT 1 #2 GOV. END BLADE CARRIER JULY 2006

MITCHELL #2 GOV. END BLADE CARRIER

BOLTED	
UNBOLTED	X

	ROW 4		ROW 5		ROW 6	
A	40.043	40.026	41.927	41.916	43.928	43.940
B	40.055	40.035	41.919	41.900	43.909	43.921
C	40.040	40.029	41.908	41.890	43.903	43.921
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: April 30, 2006
TAKEN BY: Halstead and Pence

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 21

JULY 20, 2006

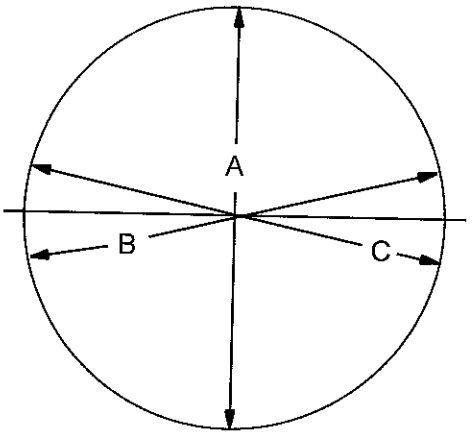
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

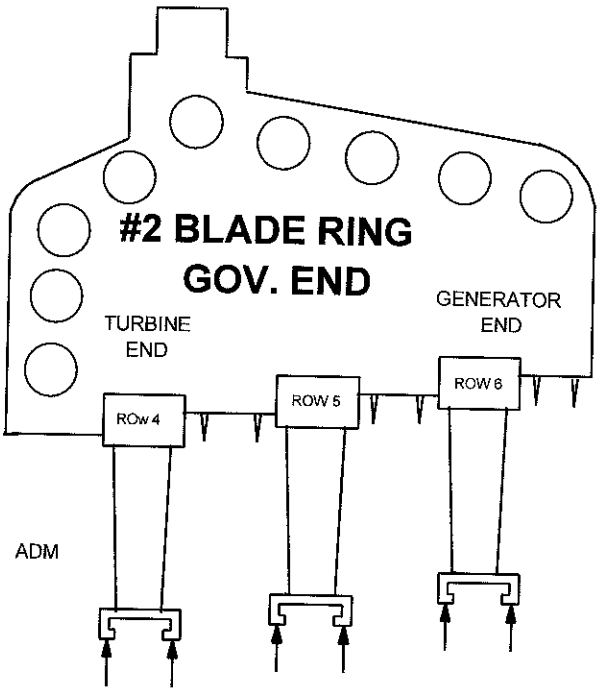
#2 BLADE RING (CONTINUED)

MITCHELL U-1 #2 GOV. END BLADE CARRIER JULY 2006

BOLTED	X
UNBOLTED	

	ROW 4		ROW 5		ROW 6	
A	40.039	40.024	41.924	41.909	43.932	43.920
B	40.051	40.035	41.924	41.906	43.927	43.914
C	40.041	40.029	41.929	41.896	43.927	43.906
	DIS	ADM	DIS	ADM	DIS	ADM





DATE:MAY 1, 2006
TAKEN BY:SMOOT & PENCE

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

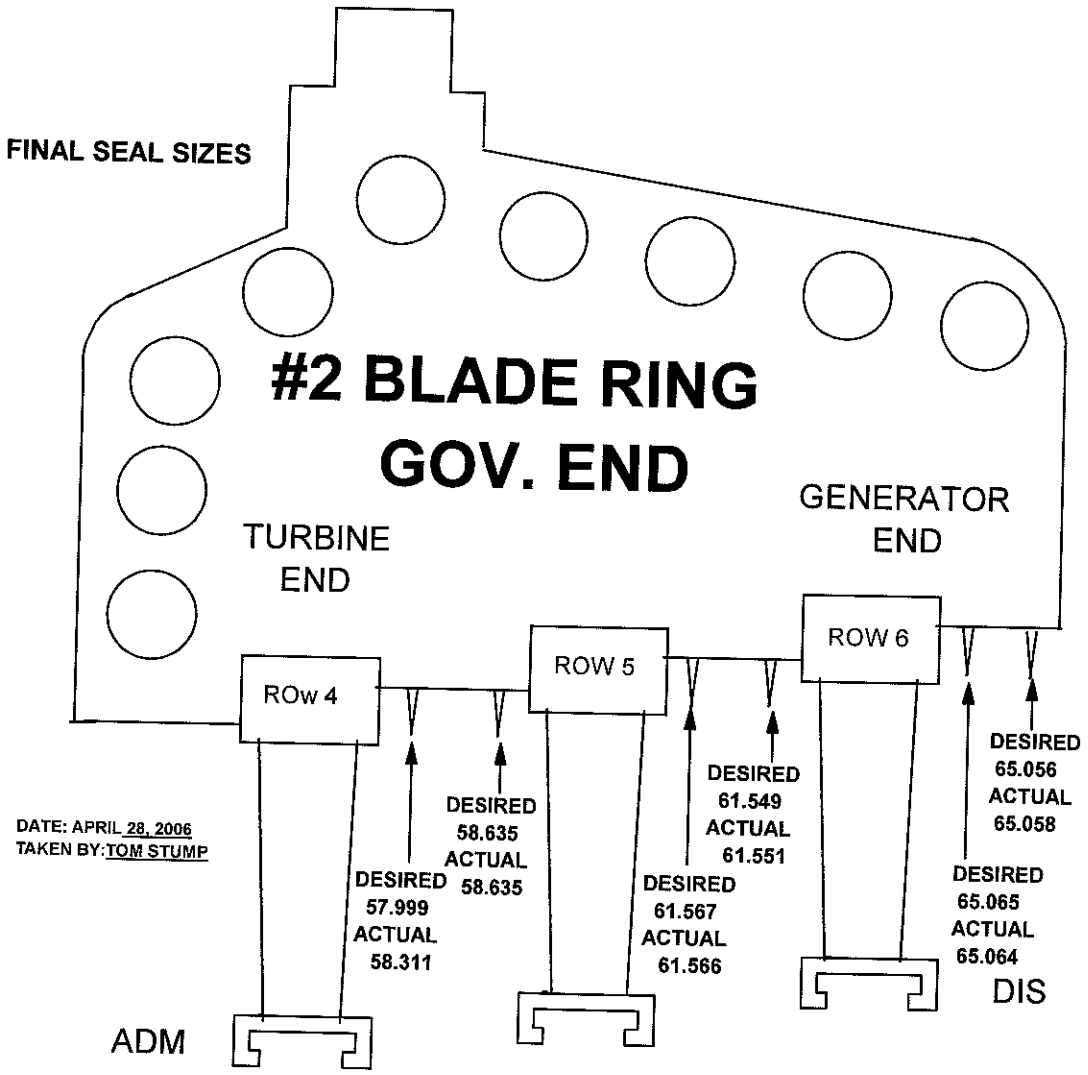
PAGE 22

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

#2 BLADE RING (CONTINUED)

MITCHELL U-1 #2 BLADE RING JULY 2006



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 23

JULY 20, 2006

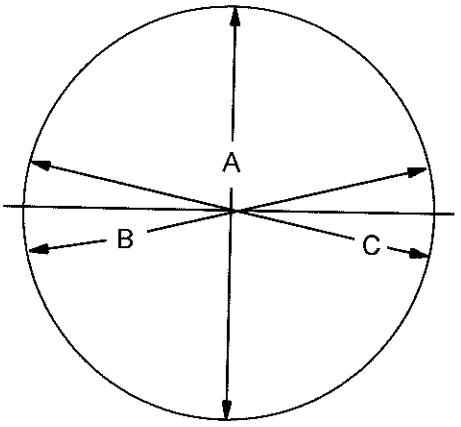
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

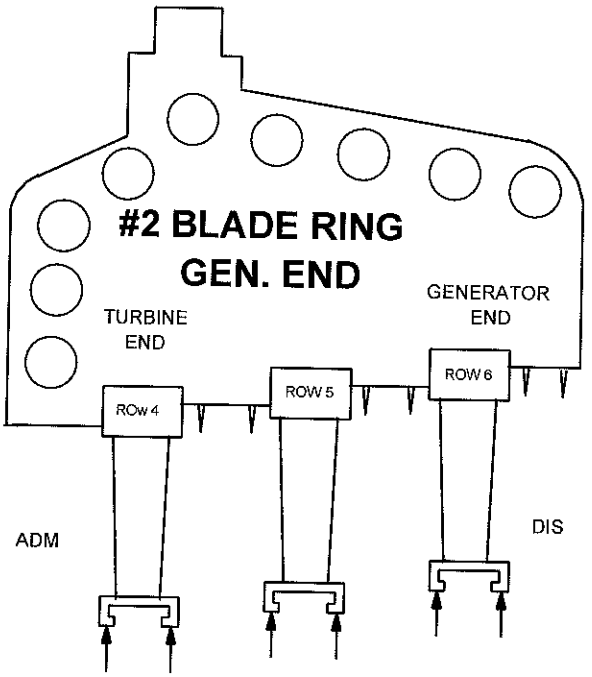
#2 BLADE RING (CONTINUED)

MITCHELL #2 GEN. END BLADE CARRIER

BOLTED	
UNBOLTED	X

	ROW 4		ROW 5		ROW 6	
A	40.082	40.047	41.939	41.921	43.938	43.925
B	40.023	39.993	41.890	41.878	43.893	43.877
C	40.034	40.007	41.887	41.875	43.895	43.889
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: May 1, 2006
TAKEN BY: Smoot and Pence

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 24

JULY 20, 2006

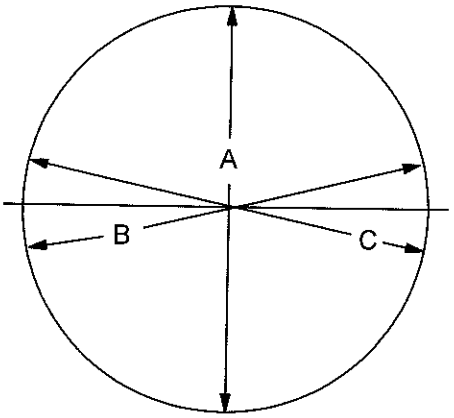
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

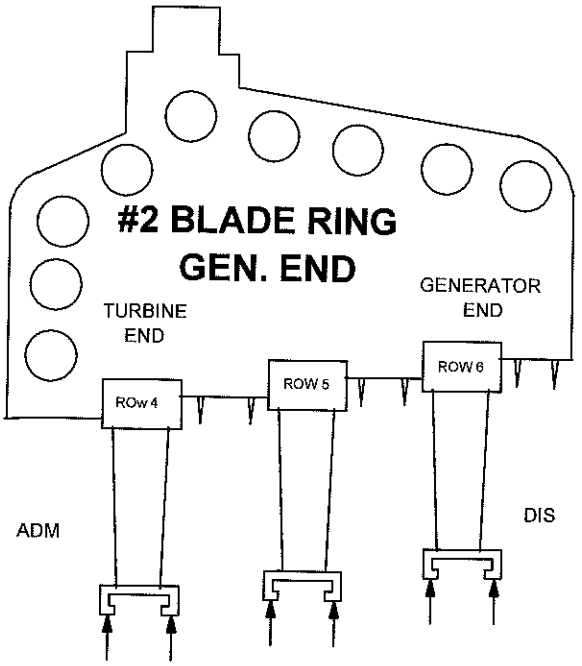
#2 BLADE RING (CONTINUED)

MITCHELL U-1 #2 GEN. END BLADE CARRIER

BOLTED	X
UNBOLTED	

	ROW 4		ROW 5		ROW 6	
A	40.059	40.030	41.925	41.909	43.931	43.921
B	40.038	40.022	41.900	41.882	43.912	43.897
C	40.029	40.014	41.897	41.879	43.900	43.983
	DIS	ADM	DIS	ADM	DIS	ADM





DATE: May 1, 2006
TAKEN BY: Smoot and Pence

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

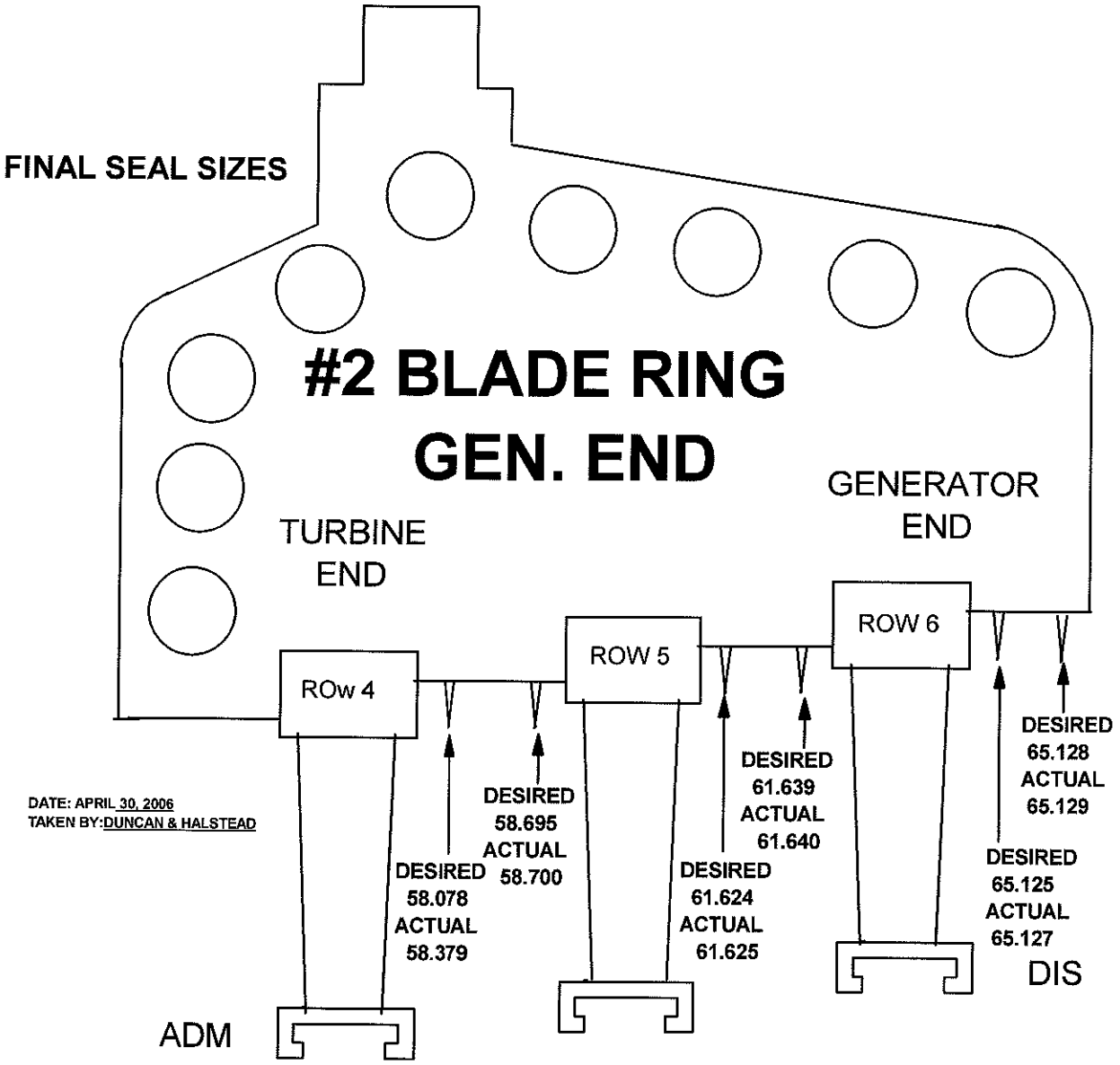
PAGE 25

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

#2 BLADE RING (CONTINUED)

MITCHELL U-1 #2 BLADE RING JULY 2006



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 26

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLER "11 A & 11 B"

The 11 A circulating water pump impeller assembly was transported to CMS for inspection and repair. The following is a description of the repairs performed:

- Magnetic particle(wet fluorescent) inspection of the exposed areas on the circulating water pump shafts revealed no defect indications (cracks) are present.
- The impeller assembly was disassembled for cleaning and inspection.
- The type 304 stainless steel impeller has areas of cavitation on the vane sections. These areas of cavitation were ground to produce a smooth surface. The ground areas were weld repaired using ER308L stainless steel filler metal. The area to be welded was preheated only enough to remove moisture prior to welding.
- Areas of erosion on the outside of the flow guide were filled using Defcon Ceramic Repair 11700 then the outside of the flow guide was coated with Chesterton 855 to prevent erosion damage.
- The impeller assembly was reassembled using new packing sleeves and new bearings. All other assembly components were reused.
- See sketches below for dimensional information:

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 27

JULY 20, 2006

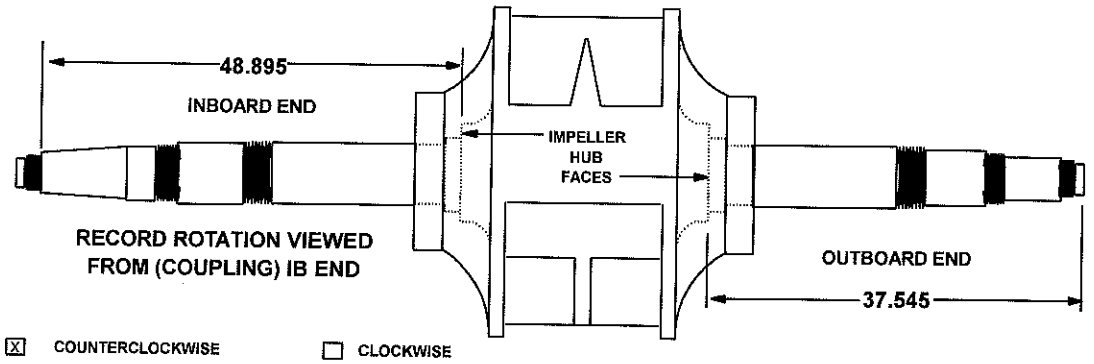
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

MITCHELL U-1 CWP JULY 2006

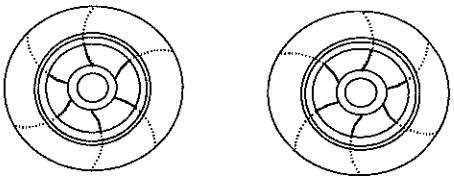
IMPELLER AXIAL POSITION & ROTATION

PUMP 11 A

SKETCH #1



[X] COUNTERCLOCKWISE [ ] CLOCKWISE



DATE: 4-18-06
RECORDED BY: Rick Stickley

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 28

JULY 20, 2006

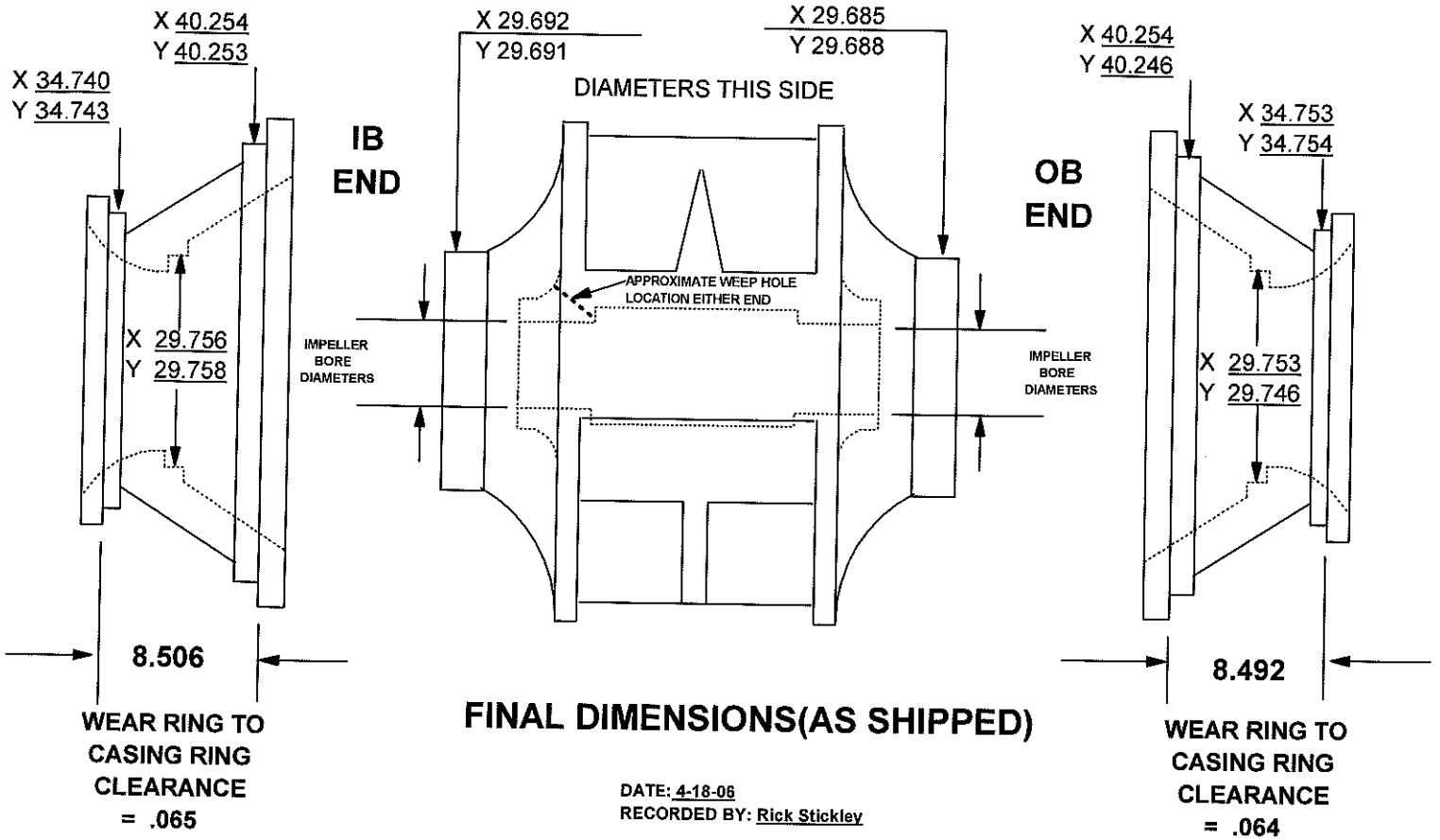
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP IMPELLER ASSEMBLY JULY 2006

PUMP 11 A

SKETCH #2



FINAL DIMENSIONS(AS SHIPPED)

DATE: 4-18-06
RECORDED BY: Rick Stickley

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 29

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

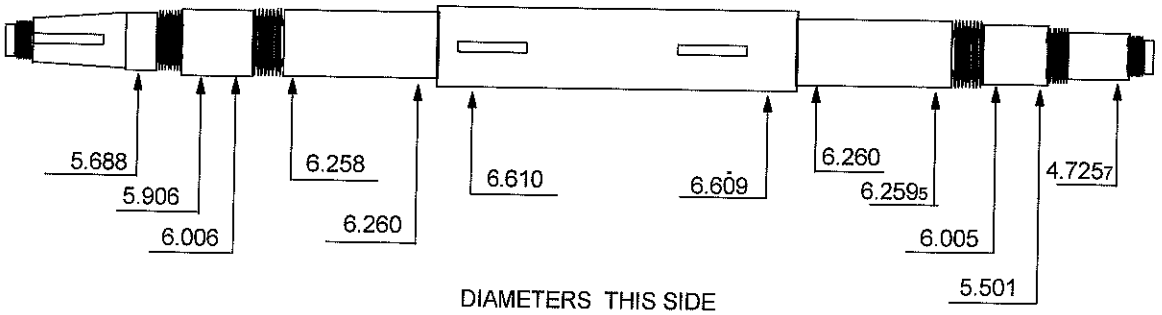
MITCHELL U-1 CWP 11A SHAFT JULY 2006

PUMP 11 A

SKETCH #3

EXISTING SHAFTWAS REUSED (AS RECEIVED)

COUNTERCLOCKWISE ROTATION



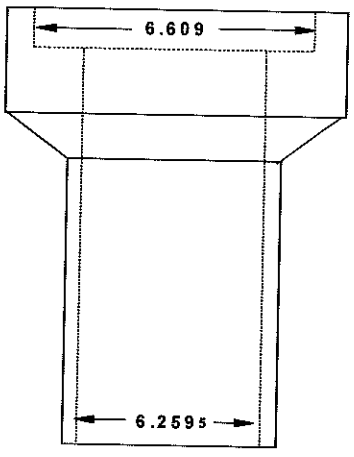
DATE: 4-18-06
RECORDED BY: Mike Smoot

MITCHELL U-1 CWP SLEEVES (NEW) JULY 2006

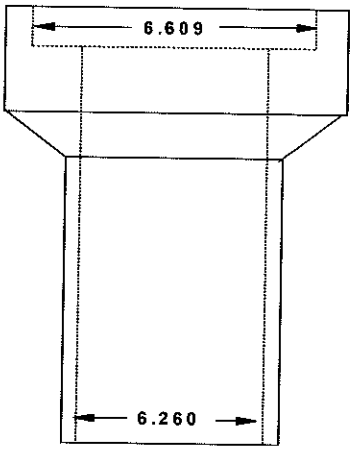
NEW SLEEVES

SKETCH #4

PUMP 11 A



DATE: May 15, 2006
RECORDED BY: Pyles/Harpold



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 30

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

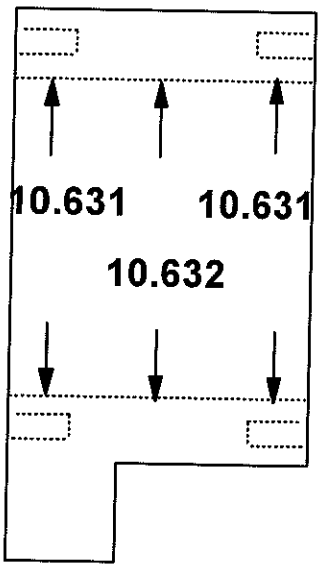
CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL UNIT 1 CWP 11 A JULY 2006

SKETCH #5

PUMP 11 A BEARING HOUSINGS

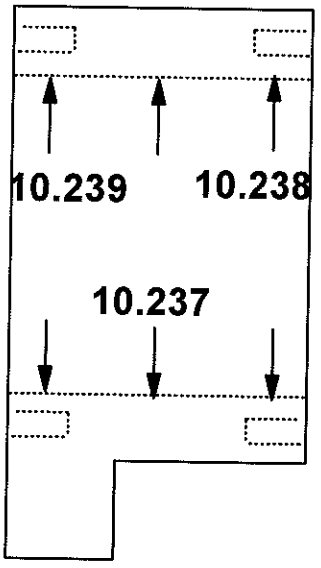
INBOARD HOUSING



MIC DIRECTLY WHERE THE BEARING FITS.

DATE: 4-18-06
RECORDED BY: Mike Smoot

OUTBOARD HOUSING



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 31

JULY 20, 2006

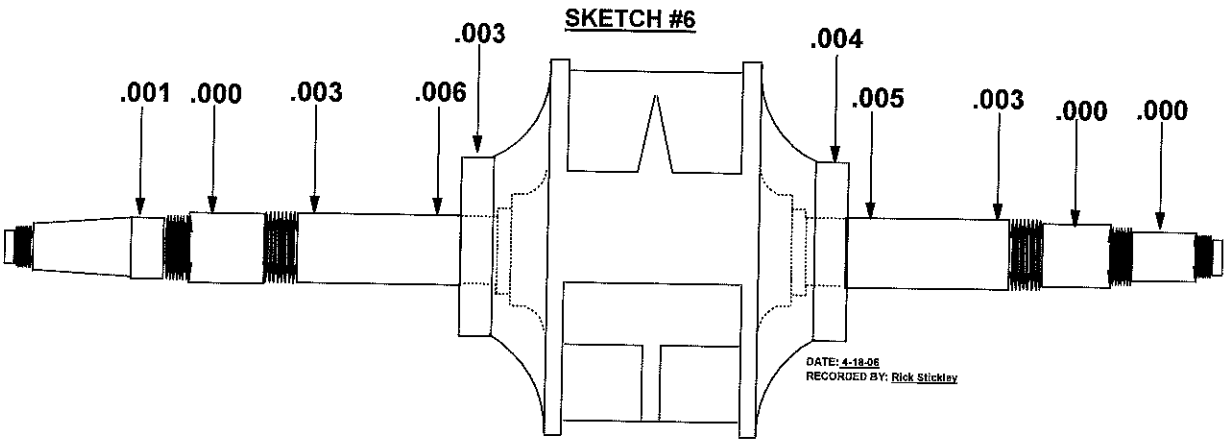
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11 A JULY 2006

FINAL RUNOUT CHECKS WITHOUT PACKING SLEEVES

CWP PUMP 11 A



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 32

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

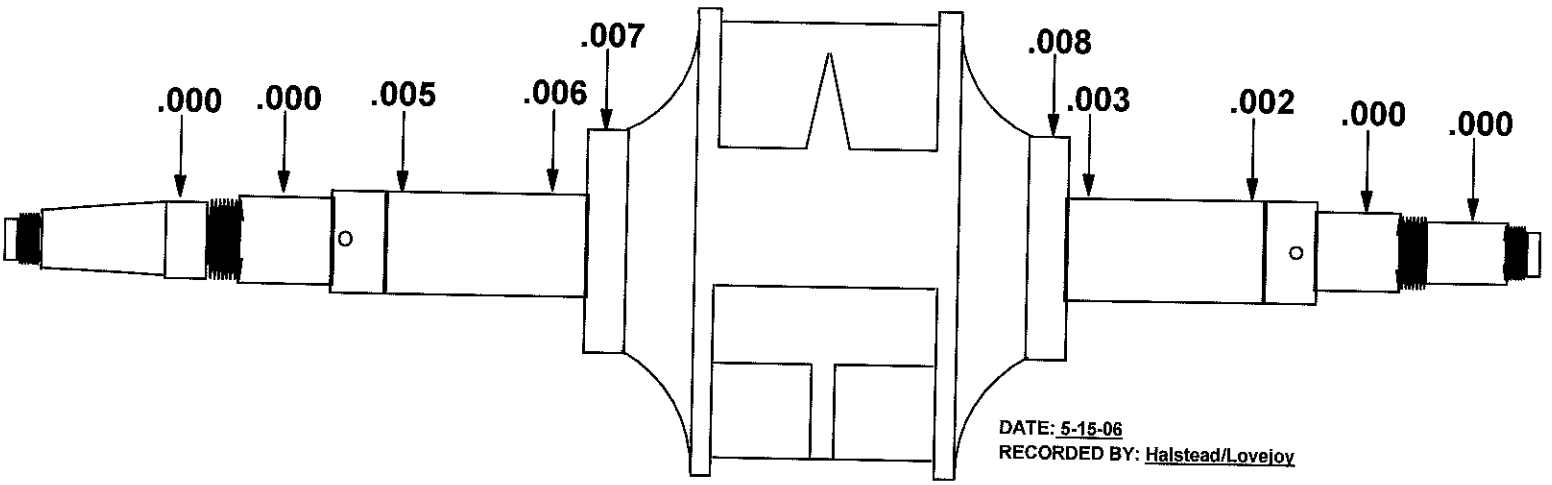
CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11A JULY 2006

RUNOUT CHECKS WITH PACKING SLEEVES

CWP 11 A

SKETCH #7



FINAL

RUNOUT CHECK

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 33

JULY 20, 2006

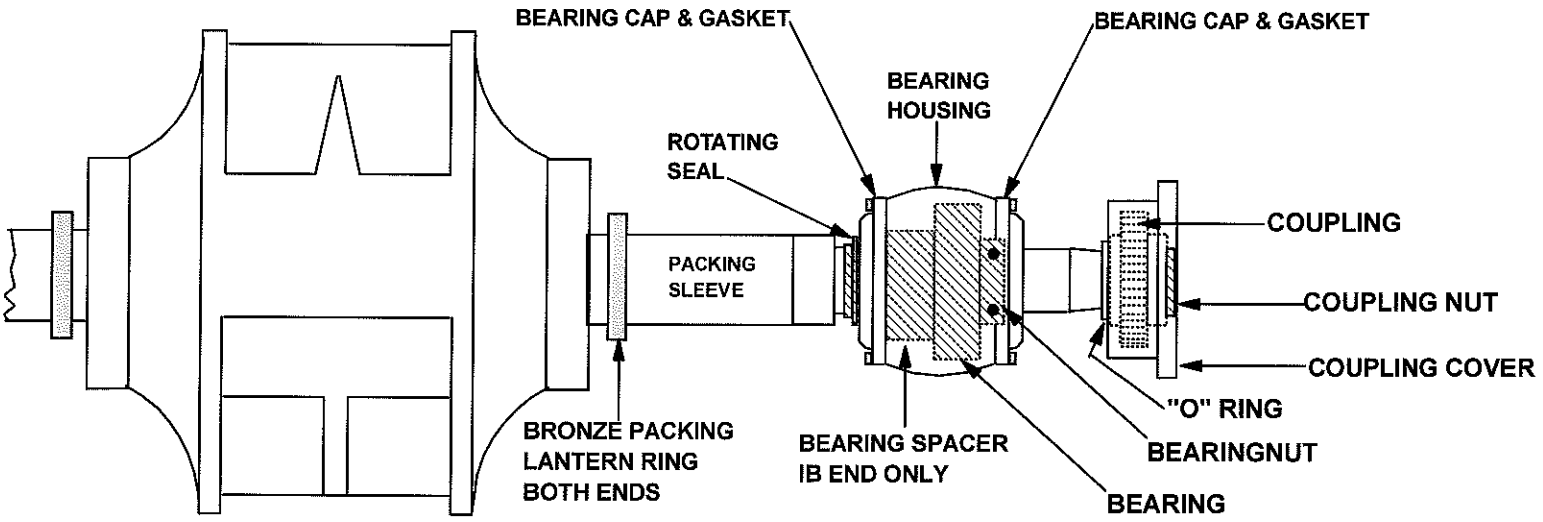
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11 A

PARTS DESCRIPTION

SKETCH #8



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 34

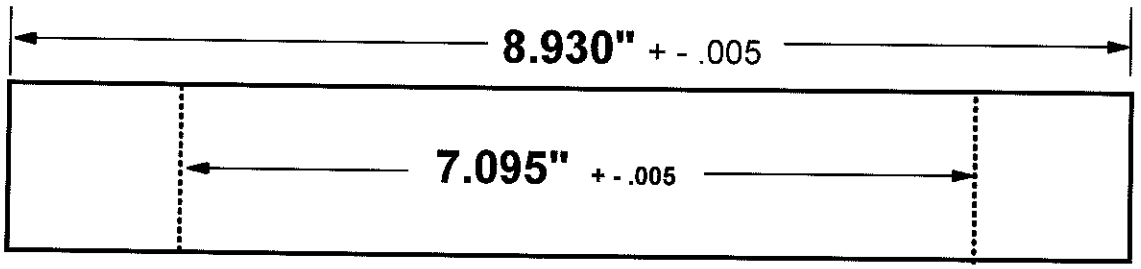
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11A
BRONZE PACKING RINGS
ID AND OD DIAMETERS

SKETCH #9



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 35

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

The 11 B circulating water pump impeller assembly was transported to CMS for inspection and repair. The following is a description of the repairs performed:

- The impeller assembly was disassembled for cleaning and inspection.
- The type 304 stainless steel impeller has areas of cavitation on the vane sections. These areas of cavitation were ground to produce a smooth surface. The ground areas were weld repaired using ER308L stainless steel filler metal. The area to be welded was preheated only enough to remove moisture prior to welding.
- Areas of erosion on the outside of the flow guide were filled using Defcon Ceramic Repair 11700 then the outside of the flow guide was coated with Chesterton 855 to prevent erosion damage.
- The impeller assembly was reassembled using new packing sleeves and new bearings. All other assembly components were reused.

See sketches below for dimensional information:

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 36

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

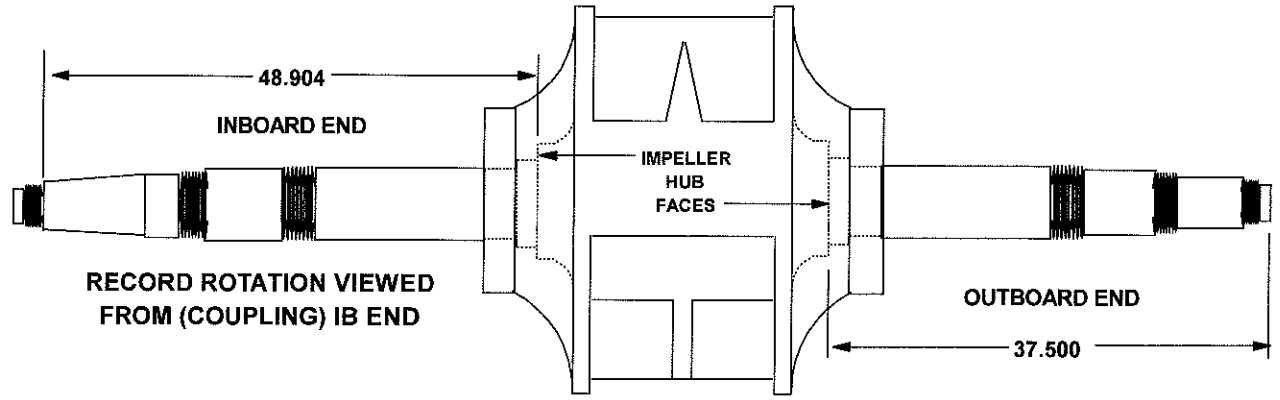
CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11 B JULY 2006

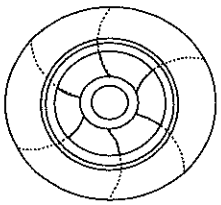
IMPELLER AXIAL POSITION & ROTATION

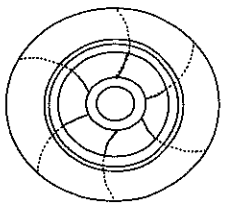
PUMP 11 B

SKETCH #1



☐ COUNTERCLOCKWISE ☒ CLOCKWISE





DATE: 4-18-06
RECORDED BY: Rick Stickley

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 37

JULY 20, 2006

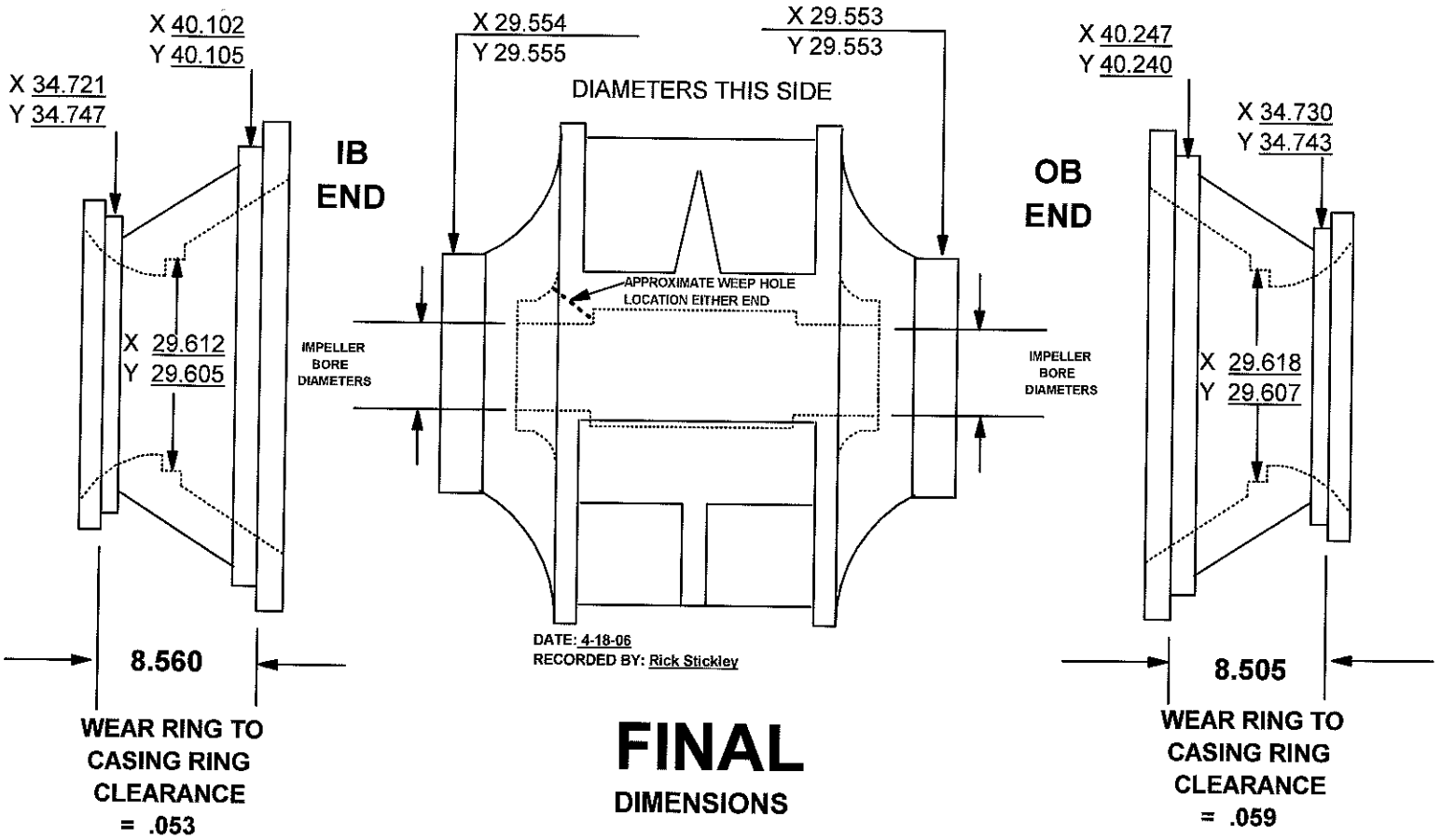
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11B JULY 2006

PUMP 11 B

SKETCH #2



FINAL

DIMENSIONS

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 38

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

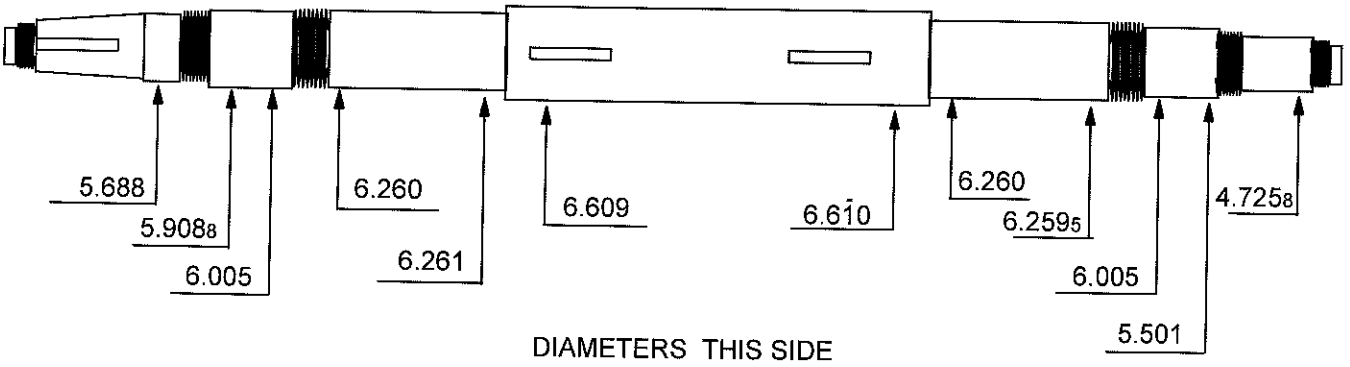
MITCHELL U-1 CWP SHAFT 11B JULY 2006

EXISTING
SHAFT
DIAMETERS

CLOCKWISE ROTATION

CWP SHAFT 11B

SKETCH #3



DIAMETERS THIS SIDE

DATE: 4-18-06
RECORDED BY: Rick Stickley

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 39

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

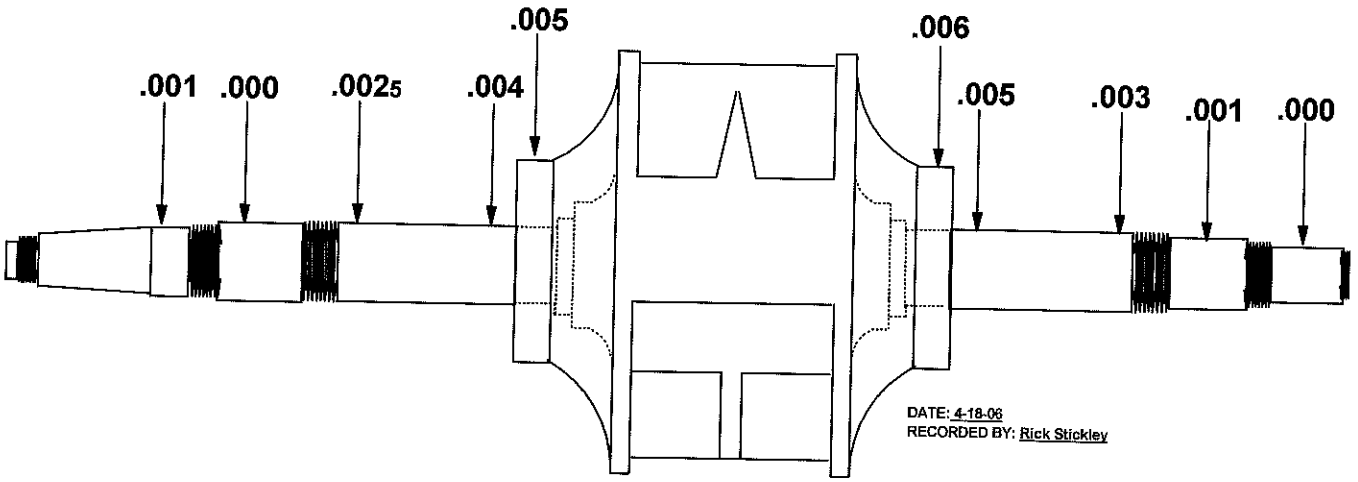
CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11B FINAL RUNOUT CHECKS JULY 2006

RUNOUT CHECKS WITHOUT PACKING SLEEVES

PUMP 11 B

SKETCH #4



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 40

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11 B JULY 2006

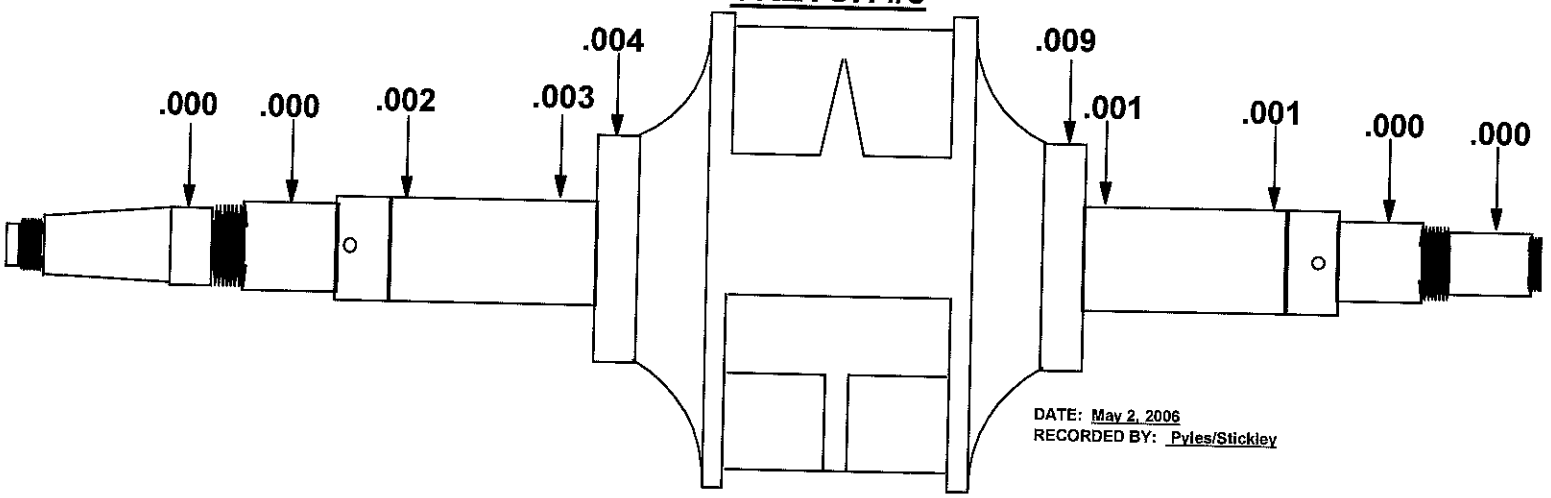
RUNOUT CHECKS WITH PACKING SLEEVES

PUMP 11 B

FINAL

RUNOUT CHECK

SKETCH #5



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 41

JULY 20, 2006

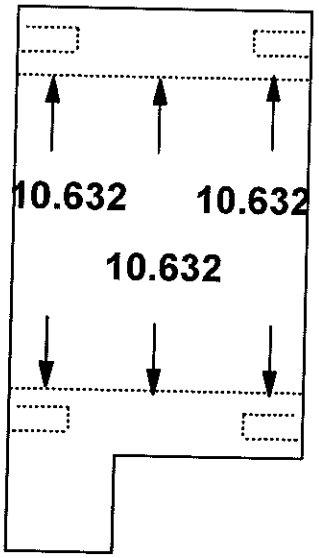
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-2 CWP 11 B JULY 2006

PUMP 11 B

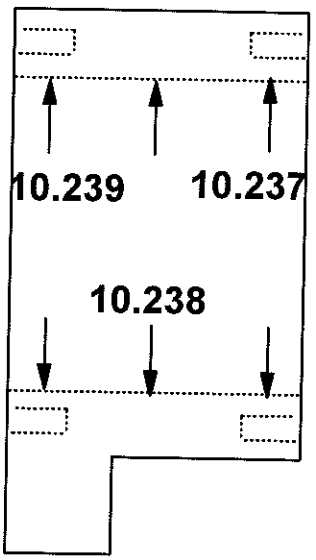
INBOARD BEARING HOUSING



MIC DIRECTLY WHERE THE BEARING FITS.

DATE: 4-18-06
RECORDED BY: Mike Smoot

OUTBOARD BEARING HOUSING



SKETCH #6

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 42

JULY 20, 2006

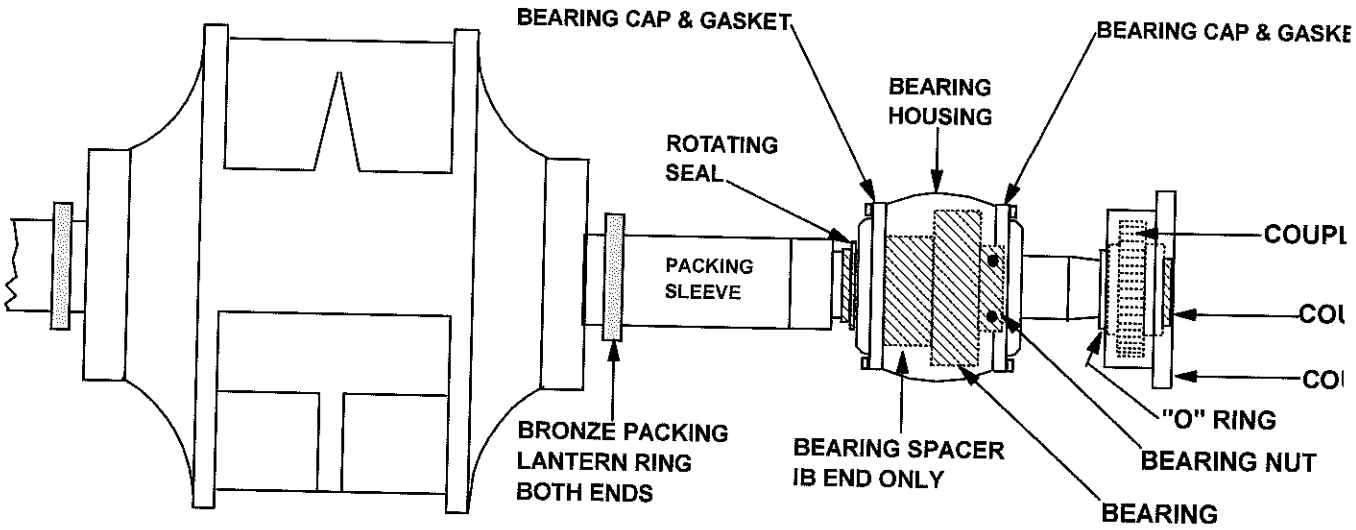
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

CIRCULATING WATER PUMP IMPELLERS (CONTINUED)

MITCHELL U-1 CWP 11B JULY 2006

PARTS DESCRIPTION

SKETCH #7



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 43

JULY 20, 2006

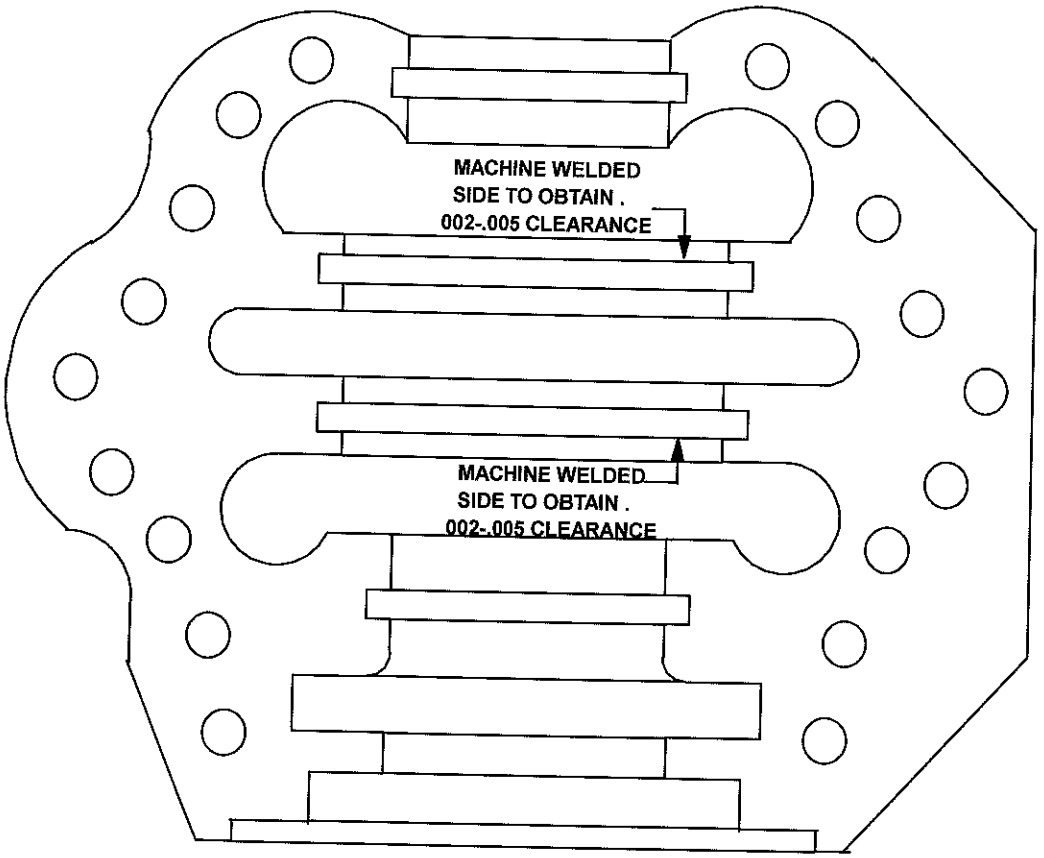
OUTAGE WORK PERFORMED @ CMS (CONTINUED)

MAIN OIL PUMP HOUSING

The main oil pump housing was transported to CMS where it was weld repaired and machined. See attached sketch for area that was welded and machined.

MITCHELL UNIT 1 MAIN OIL PUMP HOUSING

THERE ARE TWO GROOVES TO MACHINE IN THE LOWER HALF AND ONE GROOVE IN THE UPPER HALF



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 44

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

THROTTLE VALVE BONNETTS (4)

The throttle valve bonnets were transported to CMS and the following work was performed:

- The existing screens were removed from the strainer part of the bonnet and new screens were installed. The existing screens were bolted to the strainer. The new screens were stitch welded to the strainer body per the procedure below:

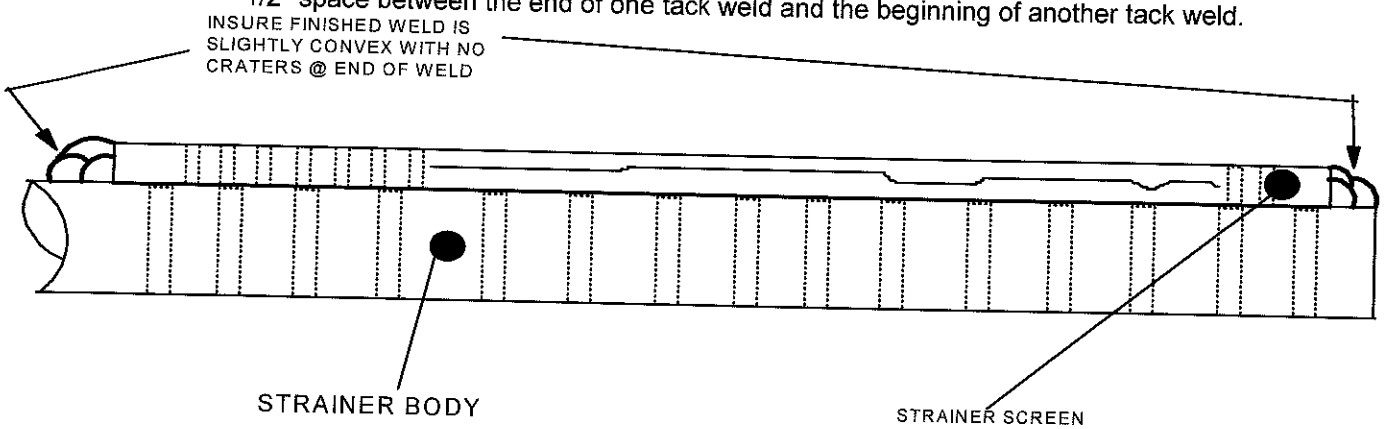
Band the new screen to insure it is tight against the body of the strainer.

Preheat the strainer to 250 degrees F.

Use ER410 stainless filler metal and tack weld the screen to the strainer body. After a tack is deposited hit it with a hammer to make sure it is against the strainer body. Start at the center of the strainer body and tack both sides starting from the center and working both sides toward the ends.

After the strainer has been tacked around the circumference and across both ends insure the strainer body weld area is preheated to a minimum of 250 degrees and maintain this during welding.

Secure the screen to the strainer body using 1-1\2" long stitch welds on 9" centers with ER410 stainless steel. Do not leave craters at the ends of the welds. That will give us a 7-1/2" space between the end of one tack weld and the beginning of another tack weld.



The intercept valve bonnet jack bolt holes were drilled to a larger diameter and tapped to repair the damaged holes.

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 45

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED)

COUPLING SPACERS

The **2nd reheat (IP)** turbine and generator end coupling spacers were transported to CMS where they were ground to the following thicknesses:

TB End = 1.424" final thickness.

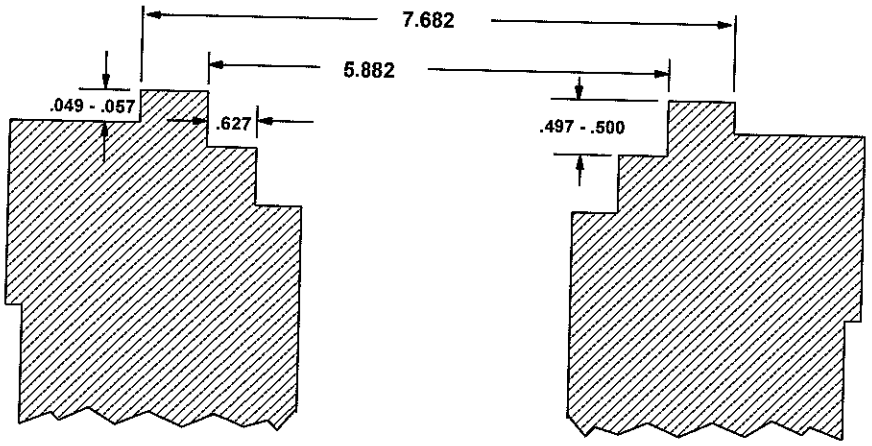
GEN End = 1.3995" final thickness.

#4 GOVERNOR VALVE

A new bushing was installed in the #4 governor valve and was machined to the following dimensions:

MITCHELL UNIT 1 #4 GOVERNAOR VALVE

INSTALLED NEW BUSHING
MACHINED RABBET FITS TO 5.572



DATE: May 8, 2006
TAKEN BY: Rick Lovejoy

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

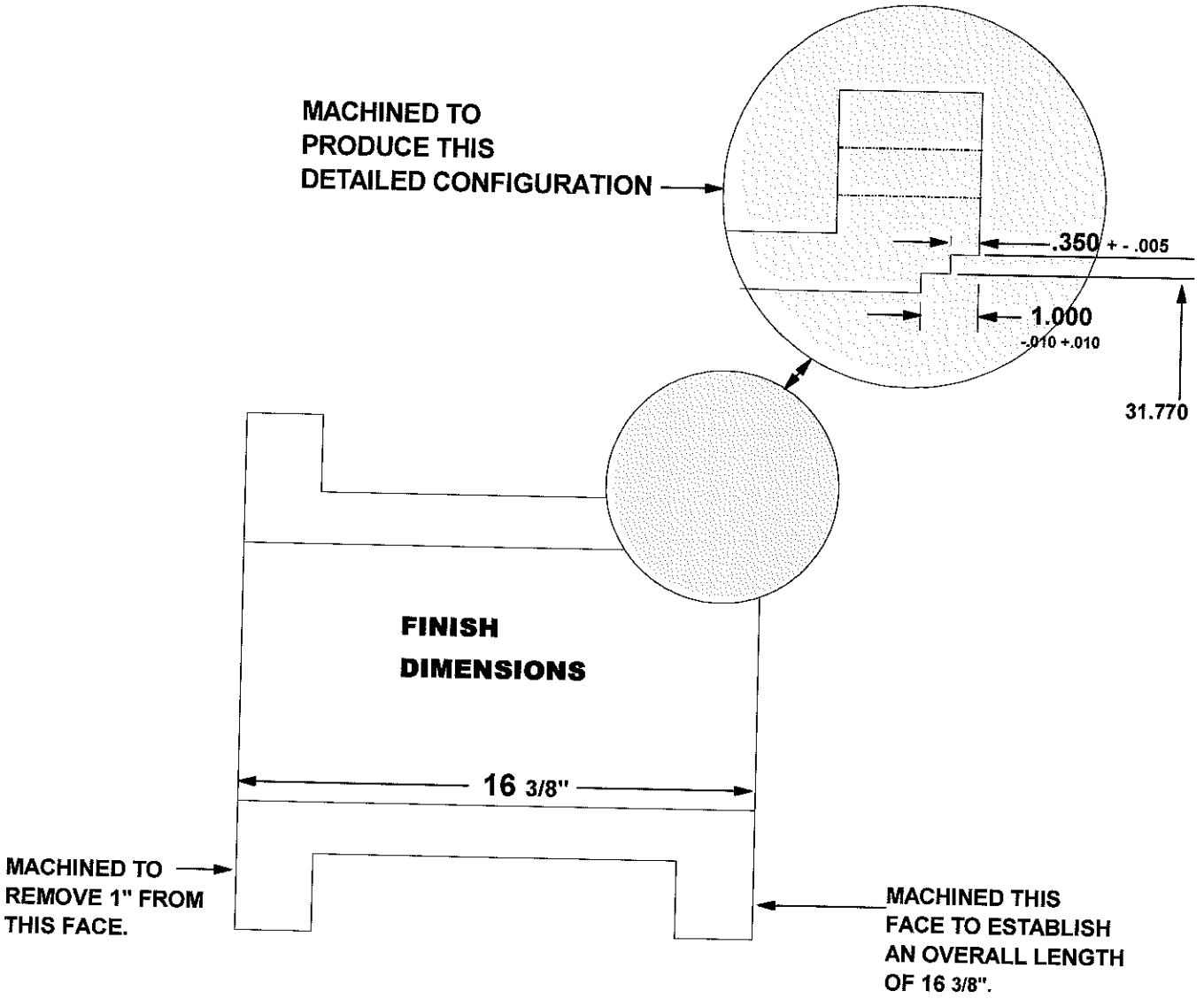
PAGE 46

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED
LUBE OIL COOLER SPOOL PIECE

The lube oil cooler spool piece was transported to CMS where it was modified by machining to reduce the overall length and to reestablish the fits in one end.

MITCHELL U-1 OIL COOLER SPOOL PIECE LANTERN RING FIT JULY



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 47

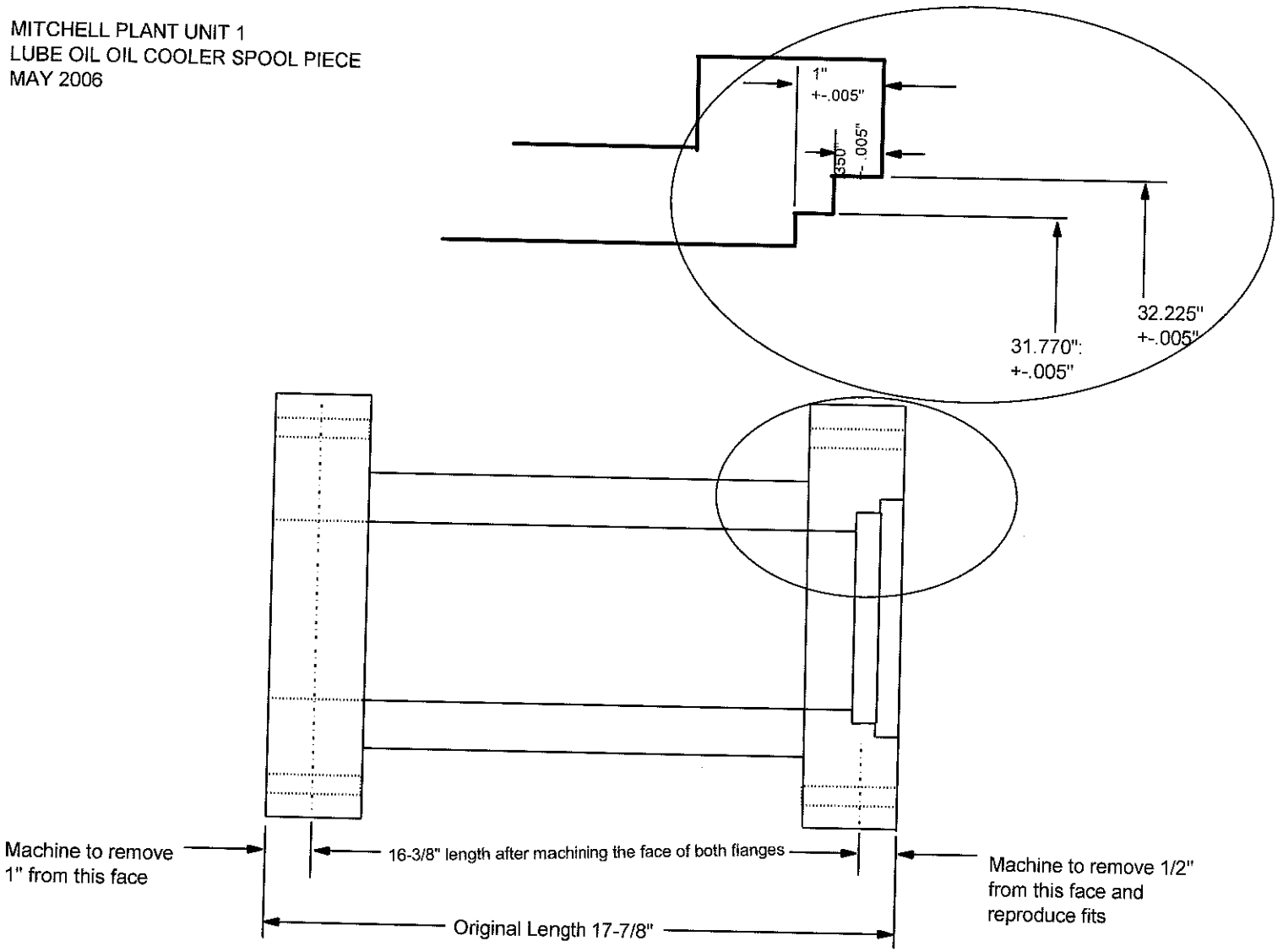
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

LUBE OIL COOLER SPOOL PIECE (CONTINUED)

The lube oil cooler spool piece was transported to CMS where it was modified by machining to reduce the overall length from 17-7/8" to 16-3/8" and to reestablish the lantern ring fits its in one end.

MITCHELL PLANT UNIT 1
LUBE OIL OIL COOLER SPOOL PIECE
MAY 2006



MITCHELL PLANT UNIT 1

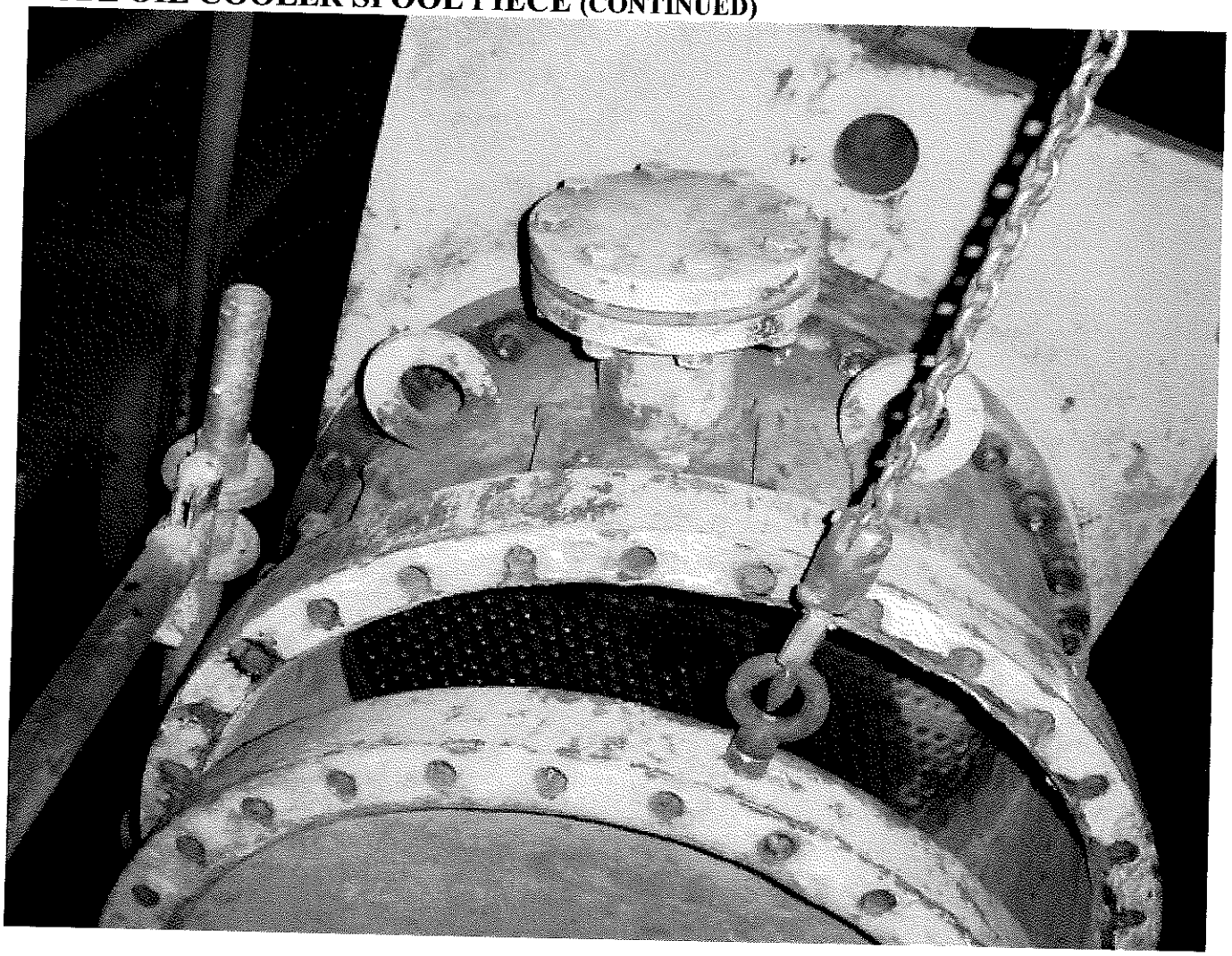
PLANNED 2006 SPRING OUTAGE

PAGE 48

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

LUBE OIL COOLER SPOOL PIECE (CONTINUED)



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 49

JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

SECOND REHEAT TURBINE ROTOR CONTROL ROTOR

The control rotor for the second reheat turbine rotor was transported to CMS for repair of rough areas on the fits. The following tasks were performed on the control rotor:

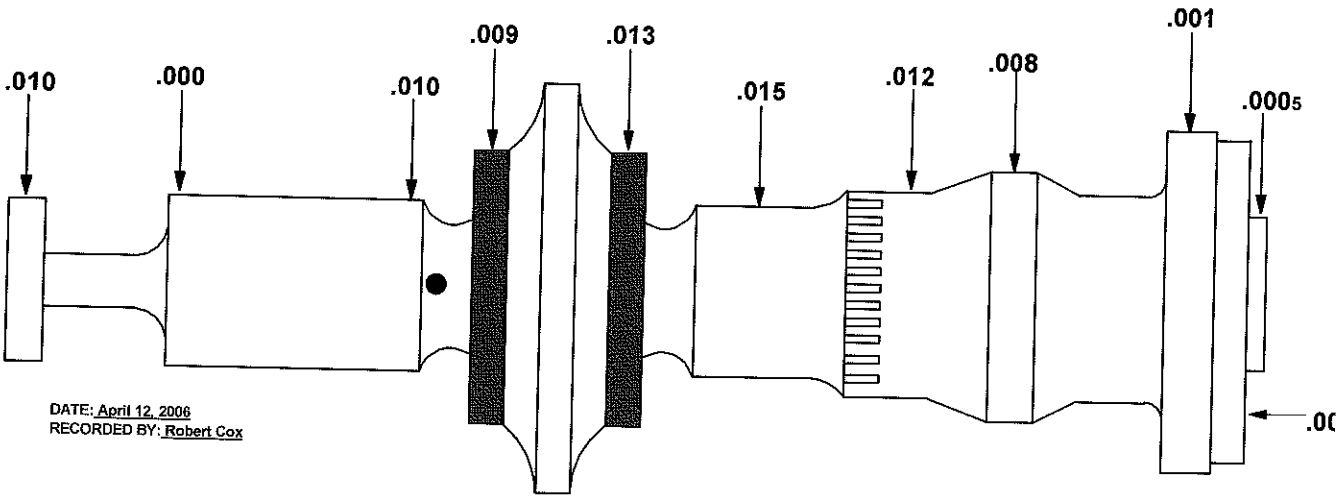
- The rotor was set up in a lathe and incoming runout readings were taken.
- Several fits on the control rotor were ground and the final sizes were recorded.
- Final runout readings were taken and recorded.

See the following sketches for detailed information:

MITCHELL UNIT 1 SECOND REHEAT TURRBINE ROTOR CONTROL ROTOR

JULY 2006

INITIAL RUNOUTS



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 50

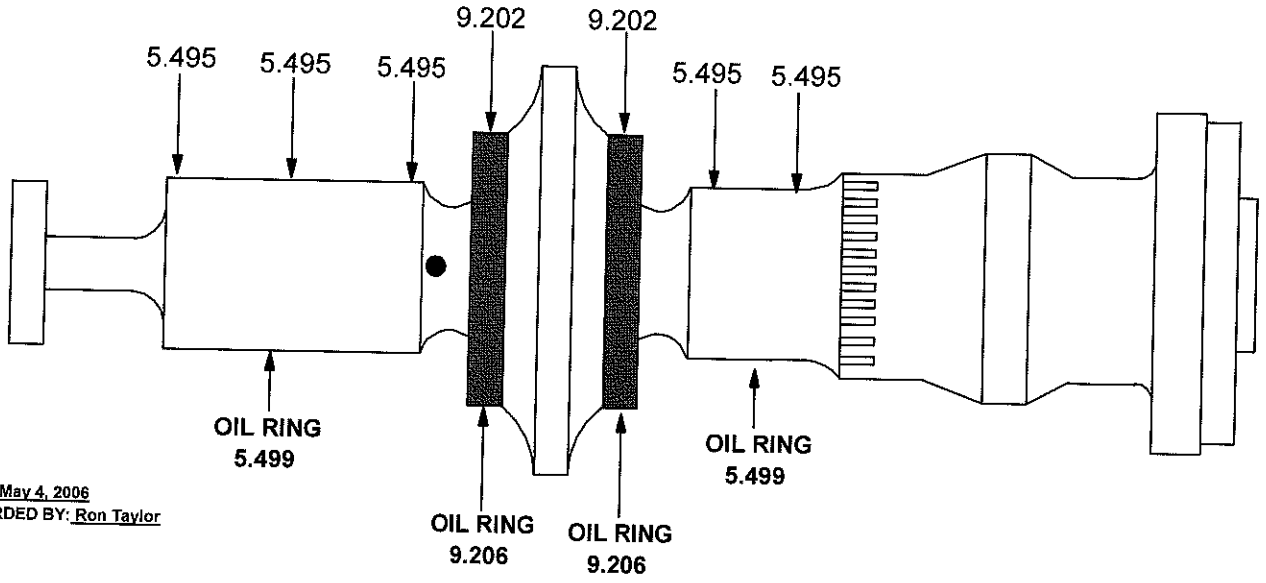
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

SECOND REHEAT TURBINE ROTOR CONTROL ROTOR(CONTINUED)

MITCHELL UNIT 1 SECOND REHEAT TURBINE ROTOR CONTROL ROTOR JULY 2006

FINAL DIAMETERS
AFTER FITS WERE
GROUND



DATE: May 4, 2006
RECORDED BY: Ron Taylor

MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 51

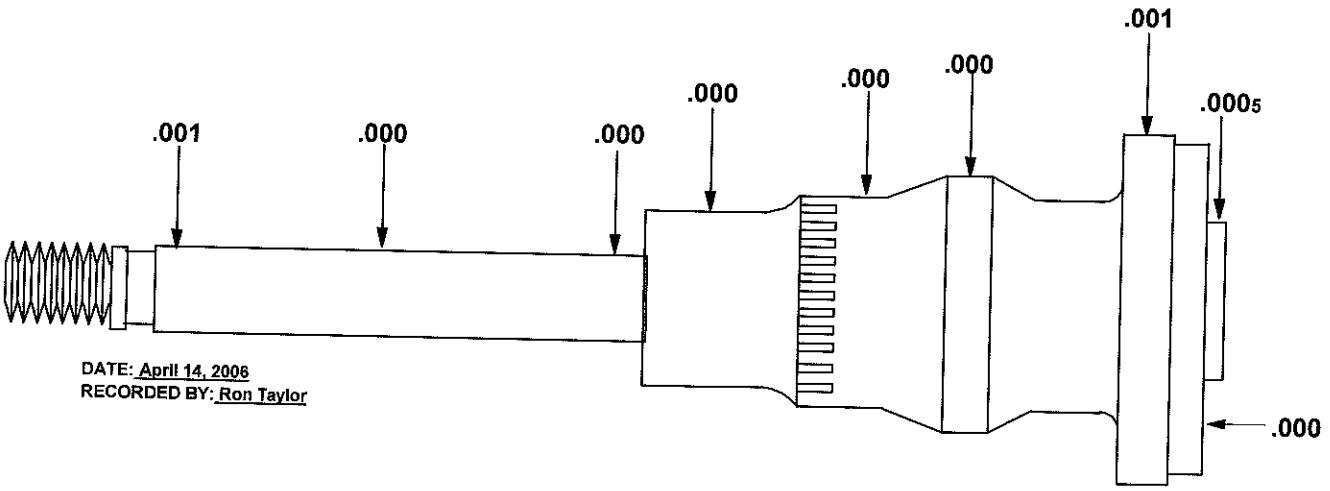
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

SECOND REHEAT TURBINE ROTOR CONTROL ROTOR(CONTINUED)

MITCHELL UNIT 1 2ND REHEAT TURBINE ROTOR CONTROL ROTOR JULY 2006

FINAL RUNOUTS
WITHOUT STUB
SHAFT BOLTED ON



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 52

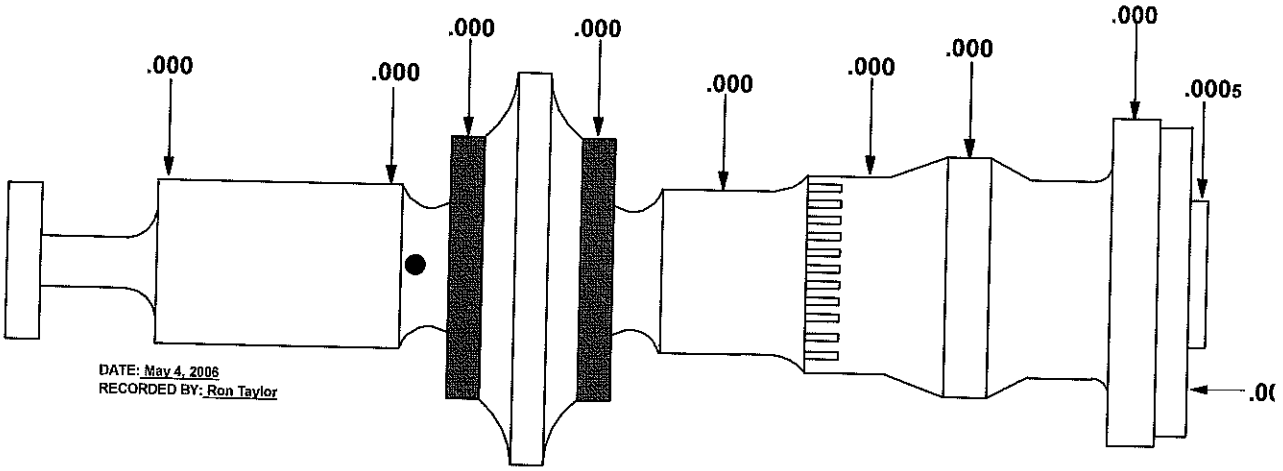
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

SECOND REHEAT TURBINE ROTOR CONTROL ROTOR(CONTINUED)

MITCHELL UNIT 1 SECOND REHEAT TURBINE ROTOR CONTROL ROTOR JULY 2006

FINAL RUNOUTS AFTER STUB SHAFT WAS REATTACHED AND FITS WERE GROUND



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 53

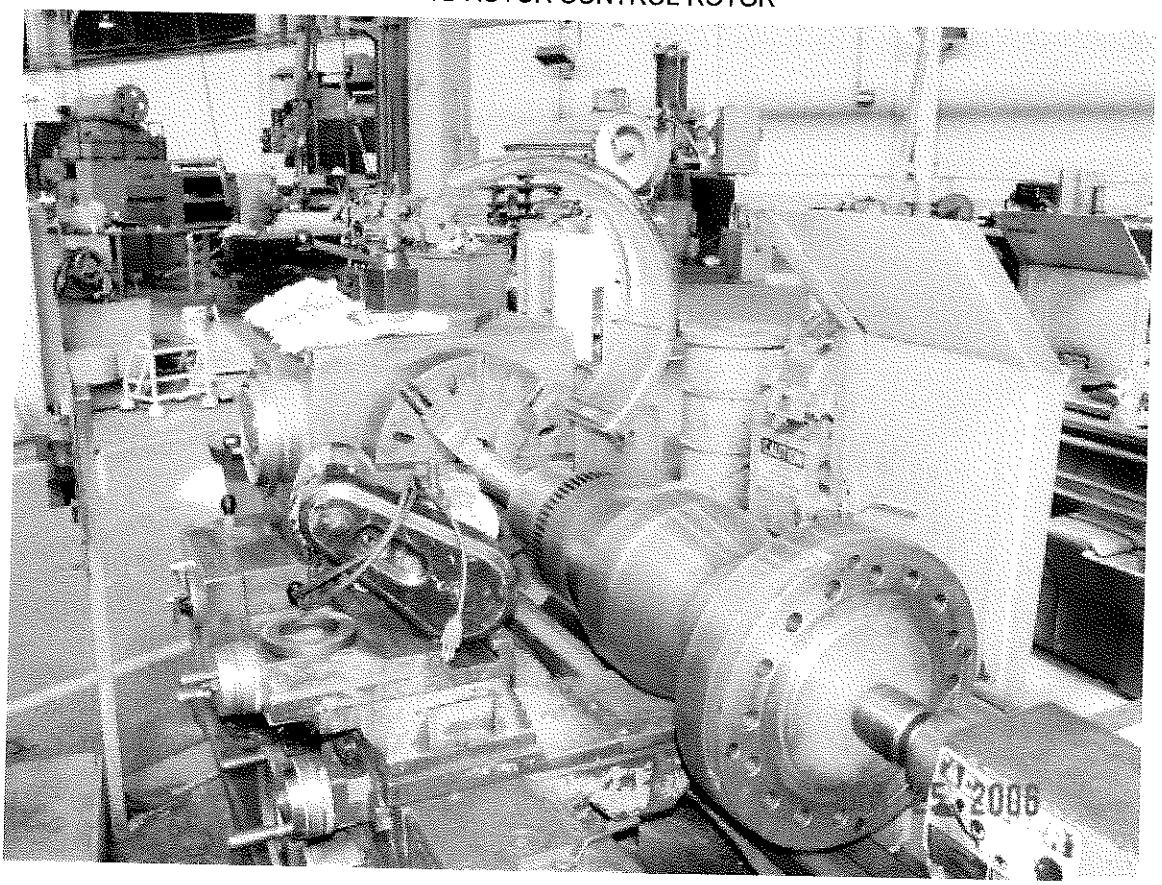
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

SECOND REHEAT TURBINE ROTOR CONTROL ROTOR(CONTINUED)

MITCHELL PLANT UNIT 1
2RH TB ROTOR
CONTROL ROTOR
APRIL 2006

ML U-1 2RH TB ROTOR CONTROL ROTOR



MITCHELL PLANT UNIT 1

PLANNED 2006 SPRING OUTAGE

PAGE 54

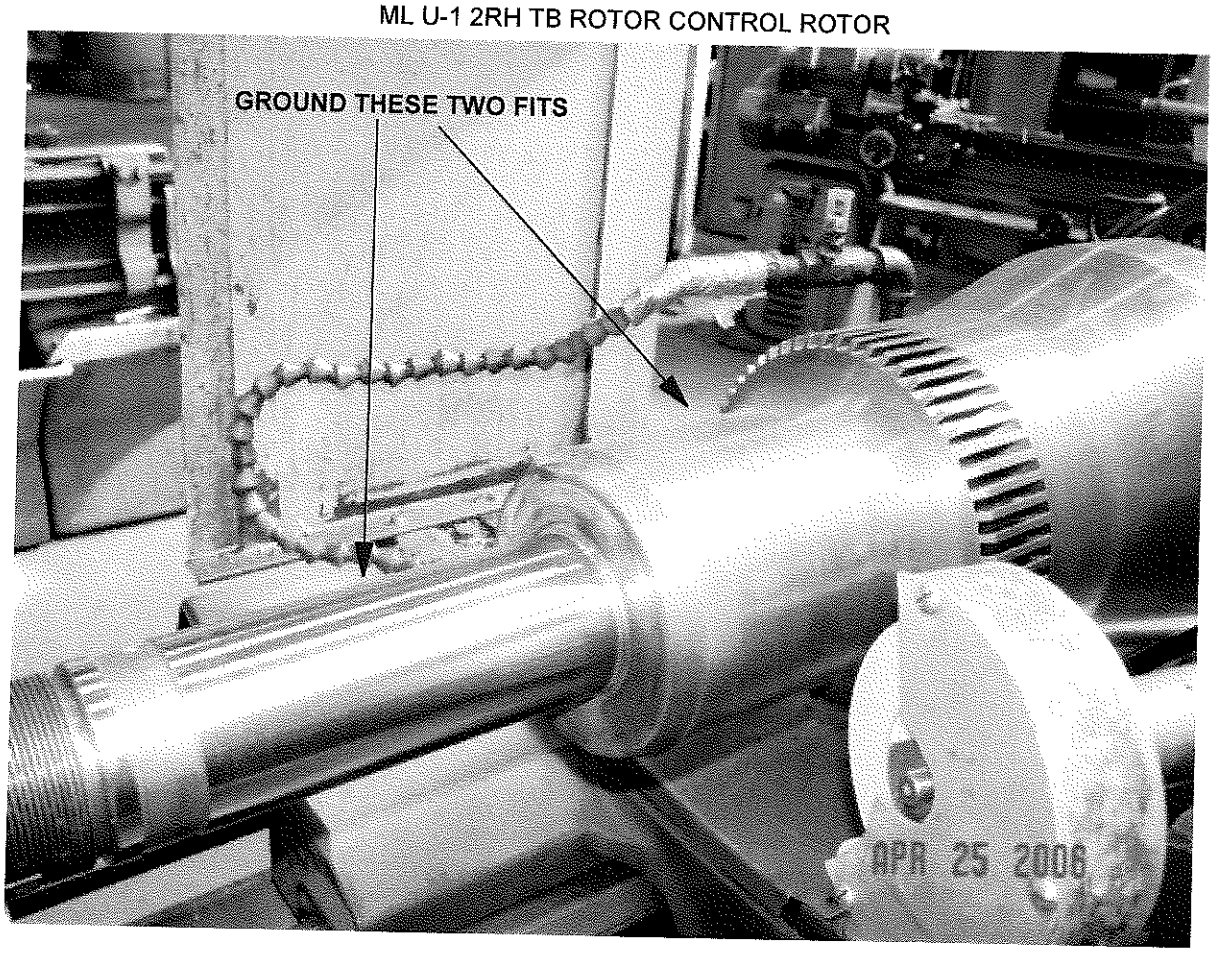
JULY 20, 2006

OUTAGE WORK PERFORMED @ CMS (CONTINUED

SECOND REHEAT TURBINE ROTOR CONTROL ROTOR(CONTINUED)

MITCHELL PLANT UNIT 1
2RH TB ROTOR
CONTROL ROTOR
APRIL 2006

ML U-1 2RH TB ROTOR CONTROL ROTOR



MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 3-31-06

ACCOUNT NUMBER 40595243-06

1. **IDENTIFICATION**

Facility Mitchell Item A & B L.P. Turbine Spindles

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☒ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** 4,000

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the governor & generator ends of the L-0 stage blades of both rotors. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Graley & Strickland DATE 3-31-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. ~~40854[illegible]-03~~ 40594989-06 DATE 4-18-06

1. **IDENTIFICATION:**
   Facility Mitchell Item Turbine Bearings
   PC/SN Unit 1

2. **TECHNIQUE:**
   ☒ Straight Beam ☐ Angle Beam ☐ Frequency - ☐ 1 MH ☐ 2.25 MH ☒ 5 MH
   ☐ Search Angle - ☒ 90° ☐ 45° ☐ 60° ☒ Single Transducer ☐ Dual Transducer
   Type of Couplant Ultra Gel II Test Unit Krautkramer USK 7D

3. **CALIBRATION - REFLECTOR TYPE:** ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. **INSPECTION PROCEDURE:** MI-1-5-2-4

5. **INSPECTION SPECIFICATIONS:**

6. **TYPE OF INDICATION:**
   ☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. **SKETCH/DESCRIPTION:**

A ultrasonic inspection was performed to the following turbine bearings to detect if babbit bond was at acceptable levels.

T3 Bearing - U/H - L/H - Bond OK
T4 Bearing - U/H - L/H - Bond OK
T11 Bearing - U/H - L/H - Bond OK

8. **INSPECTION PERFORMED BY:** (AEP Level II UT Inspector)

Signature Doug Staley 4-18-06
DATE

9. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE

65371A0402

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40594989-06
40595680-03

DATE 4-18-06

1. **IDENTIFICATION:**
   Facility Mitchell Item Stud Bolts
   PC/SN Unit 1

2. **TECHNIQUE:**
   ☒ Straight Beam ☐ Angle Beam
   ☐ Search Angle - ☒ 90° ☐ 45° ☐ 60°
   ☐ Frequency - ☐ 1 MH ☒ 2.25 MH ☐ 5 MH
   ☒ Single Transducer ☐ Dual Transducer
   Type of Couplant Ultra Gel II Test Unit Kraut Kramer USK7D

3. **CALIBRATION - REFLECTOR TYPE:** ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. **INSPECTION PROCEDURE:** MI-1-5-2-4

5. **INSPECTION SPECIFICATIONS:**

6. **TYPE OF INDICATION:**
   ☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. **SKETCH/DESCRIPTION:**
   A ultrasonic inspection was performed to the following studs.

   Reheat Shell
   Outer Shell Studs - OK
   Inner Shell Studs - OK
   Packing Gland Studs - ok

   Throttle Valves (4) - Studs ok
   Governor Valves (8) - Studs ok

8. **INSPECTION PERFORMED BY:** (AEP Level II UT Inspector)
   Signature Doug Staley 4-18-06 DATE

9. **APPROVED BY:** (NDE Supervisor)
   Signature _____ DATE

65371A0402

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40595243-06 DATE 4-19-06

1. IDENTIFICATION:

Facility Mitchell Item Steam Flow Guide Bolts

PC/SN Unit 1

2. TECHNIQUE:

☒ Straight Beam ☐ Angle Beam ☐ Frequency - ☐ 1 MH ☒ 2.25 MH ☐ 5 MH

☐ Search Angle - ☒ 90° ☐ 45° ☐ 60° ☒ Single Transducer ☐ Dual Transducer

Type of Couplant UltraGel II Test Unit Krautkramer USK7D

3. CALIBRATION - REFLECTOR TYPE: ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. INSPECTION PROCEDURE: MI-1-5-2-4

5. INSPECTION SPECIFICATIONS:

6. TYPE OF INDICATION:

☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. SKETCH/DESCRIPTION:

A ultrasonic inspection was performed to the generator & governor end flow guide bolts of A and B L.P. rotors. Results showed no cracks.

8. INSPECTION PERFORMED BY: (AEP Level II UT Inspector)

Signature Doug Staley 4-19-06 DATE

9. APPROVED BY: (NDE Supervisor)

Signature _____ DATE

65371A0402

LIQUID PENETRANT INSPECTION REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40595680-03 DATE 4-18-06

1. **IDENTIFICATION:**
   Facility Mitchell
   PC/SN Unit 1
   Item Throttle Valve Stellite Seats

2. **MATERIAL:** ☐ Ferrous ☒ Nonferrous

3. **TECHNIQUE:** ☒ Visible Dye ☐ Fluorescent ☐ Water Washable

4. **MFG/TYPE:** Cleaner _____ Penetrant _____ Developer _____

5. **INSPECTION PROCEDURE:** MI-1-5-2-2

6. **INSPECTION SPECIFICATIONS:** _____

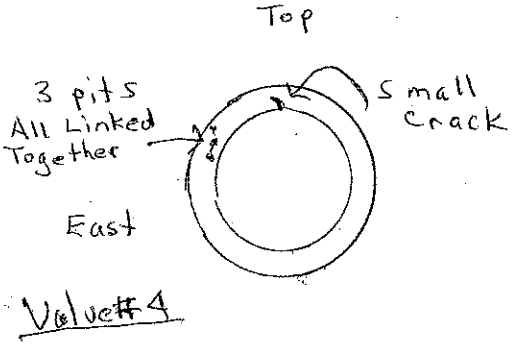
7. **TEMPERATURE:** Ambient _____ Surface _____

8. **TYPE OF INDICATION:** ☐ Crack ☐ Linear ☐ Inline Porosity ☐ Rounded ☐ Other _____

9. **SKETCH/DESCRIPTION:**

A visible dye inspection was performed to the stellite seats of the 4 throttle values.

Value #1 - Seat OK
Value #3 - Seat OK
Value #2 - Seat OK



10. **INSPECTION PERFORMED BY:** Doug Braley — 4-18-06
AEP Level II PT Inspector Signature — DATE

11. **APPROVED BY:** _____ — _____
NDE Supervisor Signature — DATE

66162A0402

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-18-06

ACCOUNT NUMBER 40595680-03

1. **IDENTIFICATION**

Facility Mitchell Item Combined Throttle-Governor Valve Bodies

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps Central Conductor

4. **CURRENT TYPE:** ☒ AC ☒ DC

5. **AMP TURNS -** 5,000 Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:** _____

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the inside and out side of the throttle (4) valves and the governor valve chest (2). No cracks were found, but most governor valve seat areas have erosion. These seats are not stellite.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Straley DATE 4-18-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER 40596 80-08

DATE 4-19-06

ACCOUNT NUMBER

1. **IDENTIFICATION**

Facility MITCHELL -U1

Item GOU. VALVE

PC/SN

2. **TECHNIQUE:**

☐ Dry Powder ☑ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☑ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☐ AC ☑ DC

5. **AMP TURNS -** 3000

6. **INSPECTION PROCEDURE:** MI 1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A MT INSPECTION WAS PERFORMED ON THE FOLLOWING.

VALVE STAND - THERE WAS 1/8" TO 1/4" CRACKS BESIDE THE RAPID FIT ON I.D. SECTION OF THE STAND

VALVE BODY - THERE WAS A 1/4" CRACK ON THE BYPASS PIPE WELD TO FLANGE. THERE WAS CRACKS NOTED IN THE RADIUS OF THE VALVE BODY BUSHING, ALSO MARKED WAS A 3/4" CRACK ON THE FLANGE FACE OUTLET HOLE.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature STRICKLAND

DATE 4-19-06

11. **APPROVED BY:** (NDE Supervisor)

Signature

DATE

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-11-06

ACCOUNT NUMBER 40594989

1. **IDENTIFICATION**

Facility Mitchell Item Hand Shutoff Valve Welds

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

12th Floor - Penthouse
5R Vent Valve - 2 welds - OK ✓
6L Vent Valve - 2 welds - OK ✓

11th Floor - Drain Valves
11R - 3 welds - OK ✓
13R - 2 welds - OK ✓
14R - 2 welds - OK ✓
12R - 3 welds - OK ✓
13L - 2 welds - OK ✓
14L - 2 welds - OK ✓
7L - Inside Penthouse - 1 weld - OK ✓

7th Floor - Drain Valves
19R - 4 welds - OK ✓

5th Floor - Drain Valves
25R - 3 welds - OK ✓
25L - 2 welds - OK ✓
29L - Inside Boiler - 1 weld - OK ✓
29R - 2 welds - OK ✓
30R - 2 welds - OK ✓
30L - 2 welds - OK ✓

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Staley DATE _____

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-19-06

ACCOUNT NUMBER _____

1. **IDENTIFICATION**

Facility Mitchell

PC/SN Unit 1

Item 32R Haul Shutoff Valve Welds

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the two welds of the valve. Results showed no defects.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Braley DATE 5-19-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-19-06

ACCOUNT NUMBER _____

1. **IDENTIFICATION**

Facility Mitchell Item 31 L Boiler Drain

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to 1 hand shut off valve weld and 1 butt weld on the outside of the boiler and 2 welds at the "t" above small expansion joint and 2-1" lines welds on the inside of the boiler. All welds were O.K.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Dualey DATE 5-19-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-17-06

ACCOUNT NUMBER 40594989-06

1. **IDENTIFICATION**

Facility Mitchell Item Drain Line Weld Repairs

PC/SN Unit 2

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the following weld repairs,

Pass 5 to 6 Bottle Drain - Coupling weld repairs just outside of boiler - OK

#3 Main Stop Valve - Below Seat Drain Line - Weld repair to the west side of 1st hand shutoff valve - OK

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Dailey DATE 4-17-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-19-06

ACCOUNT NUMBER 40594999

1. **IDENTIFICATION**

Facility Mitchell Item 2nd Reheat Steam Line

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the cover pass weld of the gamma plug. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Staley DATE 5-19-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-26-06

ACCOUNT NUMBER 40594634-10

1. **IDENTIFICATION**

Facility Mitchell Item Deaerator

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-23

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the welds on the outside of deaerator. The welds included all circumferntial, seam, inlet lines, outlet lines, small lines, stiffner, leg support, pressure relief valves and manway. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Staley DATE 4-26-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-4-06

ACCOUNT NUMBER 40594634-10

1. **IDENTIFICATION**

Facility Mitchell Item Deaerator Pad Weld

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:** _____

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the weld pad area at the outside northeast corner. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Hurley DATE 5-4-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-25-06

ACCOUNT NUMBER _____

1. **IDENTIFICATION**
   Facility Mitchell Item Deaerator
   PC/SN Unit 1

2. **TECHNIQUE:**
   ☐ Dry Powder ☒ Wet Fluorescent
   ☐ Non Fluorescent

3. **EQUIPMENT:**
   ☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**
   ☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** The new 14" drain lines were installed through the deaerator wall on the south side. A seal weld was made to both drain lines on the inside of deaerator. The welds were background from the outside to good metal. A magnetic particle inspection was performed to the inside & outside welds of both lines. All welds were O.K. The cover pass on the outside welds will be inspected after completion.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)
    Signature Doug Staley DATE 5-25-06

11. **APPROVED BY:** (NDE Supervisor)
    Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-11-06

ACCOUNT NUMBER 4059 4634-10

1. **IDENTIFICATION**
   Facility Mitchell Item Deaerator
   PC/SN Unit 1

2. **TECHNIQUE:**
   ☐ Dry Powder ☒ Wet Fluorescent
   ☐ Non Fluorescent

3. **EQUIPMENT:**
   ☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**
   ☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the next to last circumferential weld and the seam weld between next to last and last (kemi head) circ. weld in the back end of deaerator. Results showed heavy erosion (weld missing) on a 18" long area of the circ. weld on the south wall of a previously repaired area.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)
    Signature Doug Braley DATE 5-11-06

11. **APPROVED BY:** (NDE Supervisor)
    Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-15-06

ACCOUNT NUMBER 40594634

1. **IDENTIFICATION**
   Facility Mitchell Item Deaerator - Inside
   PC/SN Unit 1

2. **TECHNIQUE:**
   ☐ Dry Powder ☒ Wet Fluorescent
   ☐ Non Fluorescent

3. **EQUIPMENT:**
   ☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**
   ☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** The following areas were inspected toward the backside - inside of deaerator,

Location

#5 - Donut Weld at Back Pipe - OK
#3 - Circ. Weld - Hemi Head - Back - OK
#6 - Big Line Weld - Center Back - OK
#2 - Pad Weld - Hemi Head - OK
#8 - Pad Weld - Hemi Head - OK
#10 - Arc Strike - OK
#11 - Arc Strike - OK
#12 - Arc Strike - OK
#13 - Arc Strike - OK
#14 - Angle Bracket Weld - OK
#15 - 2 - Small 90° Welds - South Wall - OK
2 - Top 4" Pipe Welds - OK
2 - 14" Pipe Welds - South Wall - OK
#1 - Pad Weld - Northeast Lower Wall -

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)
Signature Doug Straley DATE 5-15-06

11. **APPROVED BY:** (NDE Supervisor)
Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 6-7-06

ACCOUNT NUMBER 4059 4634

1. **IDENTIFICATION**
Facility Mitchell Item Deaerator
PC/SN Unit 1

2. **TECHNIQUE:**
☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**
☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**
☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the outside cover pass on the two 14" heater drains where they go through the shell wall. Both welds were O.K.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)
Signature Doug Whaley DATE 6-7-06

11. **APPROVED BY:** (NDE Supervisor)
Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-19-06

ACCOUNT NUMBER 40594634-10

1. **IDENTIFICATION**

Facility Mitchell Item Deaerator

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the circumferential weld repair on the inside & outside of the deaerator on the South wall, Results showed the repairs were O.K.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Mealey DATE 5-19-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-9-06

ACCOUNT NUMBER 4070193O-21

1. **IDENTIFICATION**

Facility Mitchell Item #1 L.P. Heater Shell

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS** - Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the circumferential, seam, inlet nozzles and spray nozzle weld on the inside of the heater shell. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Hadley DATE 5-9-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40201930-21 DATE 5-9-06

1. **IDENTIFICATION:**
   Facility Mitchell Item #1 L.P. Heater Inlet Nozzles
   PC/SN Unit 1

2. **TECHNIQUE:**
   ☒ Straight Beam ☐ Angle Beam
   ☐ Search Angle - ☒ 90° ☐ 45° ☐ 60°
   ☐ Frequency - ☐ 1 MH ☐ 2.25 MH ☒ 5 MH
   ☐ Single Transducer ☒ Dual Transducer
   Type of Couplant UltraGel II Test Unit Krautkramer USK 7D

3. **CALIBRATION - REFLECTOR TYPE:** ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. **INSPECTION PROCEDURE:** MI-1-5-2-4

5. **INSPECTION SPECIFICATIONS:**

6. **TYPE OF INDICATION:**
   ☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. **SKETCH/DESCRIPTION:** A ultrasonic inspection was performed to the inlet nozzles to determine wall thickness. Starting at the back nozzle ~~to the~~ and moving to the front. Approx. ten thickness readings each place.

Back Nozzle
Pipe - .493 to .565
Shell Part of Nozzle - .625 to .795

2nd Nozzle
Pipe - .475 to .580
Shell Part of Nozzle - .619 to .782

3rd Nozzle
Pipe .419 to .567
Shell Part of Nozzle .642 to .793

4th Nozzle
Pipe .427 to .558
Shell Part of Nozzle .637 to .802

5th Nozzle
Pipe .429 to .508
Shell Part of Nozzle .682 to .793

Front Nozzle
Pipe .489 to .528
Shell Part of Nozzle .693 to .728

8. **INSPECTION PERFORMED BY:** (AEP Level II UT Inspector)

Signature Doug Hurley 5-9-06
DATE

9. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE

65371A0402

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 6-8-06

ACCOUNT NUMBER 40594634

1. **IDENTIFICATION**
Facility Mitchell Item Deaerator
PC/SN Unit 1

2. **TECHNIQUE:**
☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**
☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**
☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** The section of plate that was cut out of the southeast corner of the deaerator was re-installed. A magnetic particle inspection was performed to the ~~root~~ cover pass on the inside. The outside weld was ground back to clean weld and a inspection was performed. A final inspection was performed to the outside cover pass. A entry door was installed into the section of plate, a inspection was performed to the root and cover pass on the inside and to the 2 cover passes on the outside. All inspections showed no defects.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)
Signature Doug Daley DATE 6-8-06

11. **APPROVED BY:** (NDE Supervisor)
Signature _____ DATE _____

66156A0894

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 4559989-06 DATE 4-19-06

1. IDENTIFICATION:

Facility Mitchell Item BFP Turbine Rotor Shaft

PC/SN Unit 1

2. TECHNIQUE:

☒ Straight Beam ☐ Angle Beam ☐ Frequency - ☐ 1 MH ☒ 2.25 MH ☐ 5 MH

☐ Search Angle - ☒ 90° ☐ 45° ☐ 60° ☒ Single Transducer ☐ Dual Transducer

Type of Couplant Ultra Gel II Test Unit KrautKramer USK7D

3. CALIBRATION - REFLECTOR TYPE: ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. INSPECTION PROCEDURE: MI-1-5-2-4

5. INSPECTION SPECIFICATIONS:

6. TYPE OF INDICATION:

☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. SKETCH/DESCRIPTION:

A ultrasonic inspection was performed to the shaft from the pump end. Results showed no cracks.

8. INSPECTION PERFORMED BY: (AEP Level II UT Inspector)

Signature Doug Staley 4-19-06
DATE

9. APPROVED BY: (NDE Supervisor)

Signature _____ DATE

65371A0402

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 3-31-06

ACCOUNT NUMBER 40595243-06

1. **IDENTIFICATION**

Facility Mitchell Item BFP Turbine Rotor Blades

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MT-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the pump & turbine end L-0 stage blades. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Graley & Strickland DATE 3-31-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-28-06

ACCOUNT NUMBER 40594989-06

1. **IDENTIFICATION**

Facility Mitchell Item 2/H Reheat Outer Shell

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the 12 weld repairs on the shell stiffner braces (struts). Results showed all repairs were O.K.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Hurley DATE 4-28-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-18-06

ACCOUNT NUMBER 40594989-06

1. **IDENTIFICATION**

Facility Mitchell Item 2/H Outer Shell - Reheat

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the areas that were blast cleaned. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Braley DATE 4-18-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

LIQUID PENETRANT INSPECTION REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40594989-06 DATE 4-18-06

1. **IDENTIFICATION:**
   Facility Mitchell
   PC/SN Unit 1
   Item L/H Outer Shell Support Brace Welds - Reheat

2. **MATERIAL:**
   ☐ Ferrous ☒ Nonferrous

3. **TECHNIQUE:** ☒ Visible Dye ☐ Fluorescent ☐ Water Washable

4. **MFG/TYPE:** Cleaner _____ Penetrant _____ Developer _____

5. **INSPECTION PROCEDURE:** MI-1-5-2-2

6. **INSPECTION SPECIFICATIONS:** _____

7. **TEMPERATURE:** Ambient _____ Surface _____

8. **TYPE OF INDICATION:**
   ☒ Crack ☐ Linear ☐ Inline Porosity ☐ Rounded ☐ Other _____

9. **SKETCH/DESCRIPTION:**

A visible dye inspection was performed to the 16 welds of the 8 braces, See attached sheet for results.

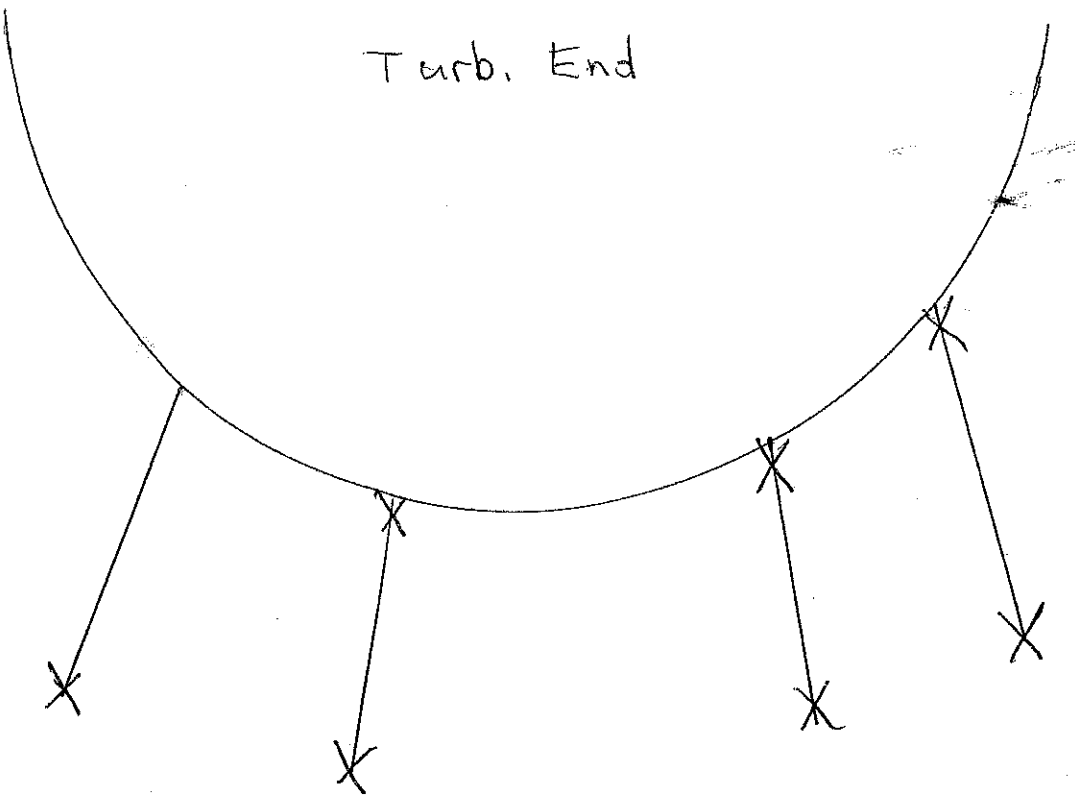
10. **INSPECTION PERFORMED BY:** Doug Linley — AEP Level II PT Inspector Signature — 4-18-06 DATE

11. **APPROVED BY:** _____ — NDE Supervisor Signature — DATE

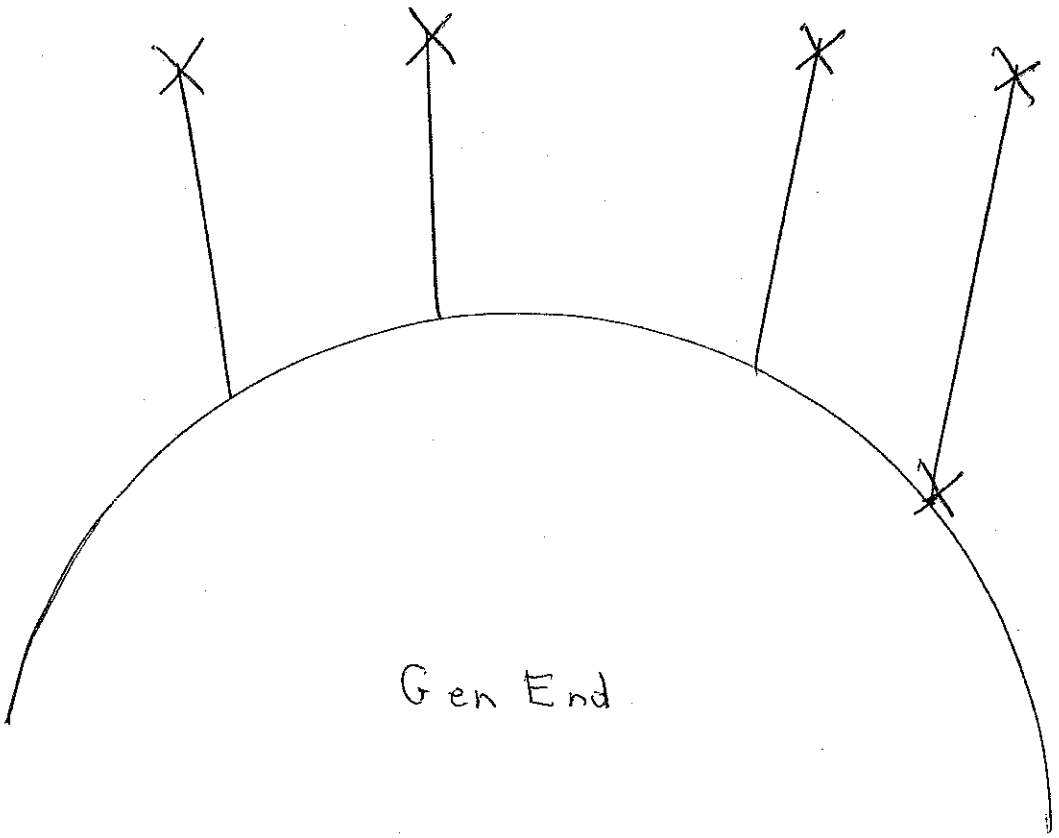
66162A0402

Mitchell U-1 Reheat L/H Outer Shell
4-18-06

Shell Support Braces



X = Cracked welds



MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-18-06

ACCOUNT NUMBER 40594989-06

1. **IDENTIFICATION**

Facility Mitchell Item 2/H Outer Shell - Reheat

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the areas that were blast cleaned. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Staley DATE 4-18-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

LIQUID PENETRANT INSPECTION REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40594989-06 DATE 4-21-06

1. **IDENTIFICATION:**
   Facility Mitchell
   PC/SN Unit 1
   Item U/H Outer Shell Support Strut Welds - Reheat

2. **MATERIAL:** [X] Ferrous [X] Nonferrous

3. **TECHNIQUE:** [X] Visible Dye [ ] Fluorescent [ ] Water Washable

4. **MFG/TYPE:** Cleaner _____ Penetrant _____ Developer _____

5. **INSPECTION PROCEDURE:** MI-1-5-2-2

6. **INSPECTION SPECIFICATIONS:** _____

7. **TEMPERATURE:** Ambient _____ Surface _____

8. **TYPE OF INDICATION:**
   [ ] Crack [ ] Linear [ ] Inline Porosity [ ] Rounded [ ] Other _____

9. **SKETCH/DESCRIPTION:**

A visible dye inspection was performed to the 16 welds of the 8 bars.

Gov. End - No Cracked Welds

Gen. End - The left side bar has a 1¼" to 1½" long crack on each weld. The right side bar has a 1¼" long crack on the top weld.

10. **INSPECTION PERFORMED BY:** Doug Staley 4-21-06
    AEP Level II PT Inspector Signature — DATE

11. **APPROVED BY:** _____ _____
    NDE Supervisor Signature — DATE

66162A0402

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 6-12-06

ACCOUNT NUMBER 40595680

1. **IDENTIFICATION**

Facility Mitchell Item 30R Drain Line Welds

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to 4 welds of 2 90° elbows. Results showed no defects.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Dudley DATE 6-12-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

LIQUID PENETRANT INSPECTION REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40594989-06 DATE 4-21-06

1. **IDENTIFICATION:**
   Facility Mitchell
   PC/SN Unit 1
   Item 4/H Outer Shell Support Strut Welds - Reheat

2. **MATERIAL:** [X] Ferrous [X] Nonferrous

3. **TECHNIQUE:** [X] Visible Dye [ ] Fluorescent [ ] Water Washable

4. **MFG/TYPE:** Cleaner _____ Penetrant _____ Developer _____

5. **INSPECTION PROCEDURE:** MI-1-5-2-2

6. **INSPECTION SPECIFICATIONS:** _____

7. **TEMPERATURE:** Ambient _____ Surface _____

8. **TYPE OF INDICATION:**
   [ ] Crack [ ] Linear [ ] Inline Porosity [ ] Rounded [ ] Other _____

9. **SKETCH/DESCRIPTION:**

A visible dye inspection was performed to the 16 welds of the 8 bars.

Gov. End - No Cracked Welds

Gen. End - The left side bar has a 1¼" to 1½" long crack on each weld. The right side bar has a 1¼" long crack on the top weld.

10. **INSPECTION PERFORMED BY:** Doug Staley 4-21-06
    AEP Level II PT Inspector Signature — DATE

11. **APPROVED BY:** _____ _____
    NDE Supervisor Signature — DATE

66162A0402

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-22-06

ACCOUNT NUMBER 40701930 - 20

1. **IDENTIFICATION**

Facility Mitchell Item #1 L.P. Heater

PC/SN Unit1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:** A magnetic particle inspection was performed to the root pass and cover pass of the front heater shell circumferntial weld. A small "C" shaped section was cut from the shell for alignment purposes. The root pass, halfwayout and the cover pass welds were inspected when the shell segment was welded back into place. All weld inspections showed no defect indications.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Braley DATE 5-22-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-21-06

ACCOUNT NUMBER _____

1. **IDENTIFICATION**

Facility Mitchell Item BFP Coupling Assembly

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent

☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

Central Conductor

4. **CURRENT TYPE:** ☐ AC ☒ DC

5. **AMP TURNS -** 4,500

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the couplings and coupling covers. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Mraley DATE 4-21-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 4554589-06 DATE 4-19-06

1. IDENTIFICATION:

Facility Mitchell Item BFP Turbine Rotor Shaft

PC/SN Unit 1

2. TECHNIQUE:

☒ Straight Beam ☐ Angle Beam ☐ Frequency - ☐ 1 MH ☒ 2.25 MH ☐ 5 MH

☐ Search Angle - ☒ 90° ☐ 45° ☐ 60° ☒ Single Transducer ☐ Dual Transducer

Type of Couplant Ultra Gel II Test Unit Krautkramer USK7D

3. CALIBRATION - REFLECTOR TYPE: ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. INSPECTION PROCEDURE: MI-1-5-2-4

5. INSPECTION SPECIFICATIONS:

6. TYPE OF INDICATION:

☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. SKETCH/DESCRIPTION:

A ultrasonic inspection was performed to the shaft from the pump end. Results showed no cracks.

8. INSPECTION PERFORMED BY: (AEP Level II UT Inspector)

Signature Doug Staley 4-19-06
DATE

9. APPROVED BY: (NDE Supervisor)

Signature _____ DATE

65371A0402

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-9-06

ACCOUNT NUMBER _____

1. **IDENTIFICATION**

Facility Mitchell Item South PA Fan

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the outboard bearing journal of the fan shaft. Results showed no cracks.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Bradley DATE 5-9-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-11-06

ACCOUNT NUMBER 40594989

1. **IDENTIFICATION**

Facility Mitchell
PC/SN Unit 1

Item Main Oil Pump Suction & Discharge Leg Welds

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the weld on each line. Results showed no defects.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Braley DATE 5-11-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

CMS NO:
ACT NO:
FACILITY: MITCHELL U-1
ITEM: THROTTLE VALVE BONNETT
PC/SN

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
SCREEN AREA			10.21		85.84	.95	.20	.03	1.22	1.04			
FLANGE O.D.			2.39		94.95								

Analysis Performed By: STRICKLAND
Date:

NDE Supv: 9-10-06
Date:

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

CMS NO:
ACT NO:
FACILITY: MITCHELL U-1
ITEM: THROTTLE VLV BONNETT SCREENS
PC/SN

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
VALVE BON. SCREEN			12.05		86.82		.05	.02	.52				
4/10/06													

Analysis Performed By: STRICKLAND

Date: 4-10-06

NDE Supv: _____

Date: _____

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

CMS NO:	
ACT NO:	
FACILITY:	Mitchell
ITEM:	2/H - Reheat Outer Shell
PC/SN	Unit 1

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
Shell-CRMo-P12			1.25		96.15	.60	.62						
Support Strut													
17 4 PH			15.82	3.35	71.26	.68	.10	.43	4.99				

Analysis Performed By: Doug Traley
Date: 4-21-06

NDE Supv:
Date:

66150A1104

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

CMS NO:
ACT NO:
FACILITY: Mitchell
ITEM: Header Pipe
PC/SN Unit 1

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
Mild					98.87	.50	0.05						

Analysis Performed By: Doug Insley

Date: 5-8-06

NDE Supv: _____

Date: _____

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

CMS NO:	
ACT NO:	
FACILITY:	Mitchell - U1
ITEM:	Main Oil Pump - Inlet - Outlet
PC/SN	Suction & Discharge

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
					9723	.37	0.03						
Mild Steel													

Analysis Performed By: Doug Dudley
Date: 5-8-06

NDE Supv: _____
Date: _____

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

CMS NO:
ACT NO:
FACILITY: Mitchell
ITEM: Expansion Joints
PC/SN Unit 1

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
L.P. "B" Snout					97.78	.39	0.03						
Mild Steel													
Upper Exp. Joint													
Mild Steel					98.03	.43	0.05						
Lower Exp. Joint					98.42	.36	0.05						
Mild Steel													

Analysis Performed By: Tony Insley
Date: 5-14-06

NDE Supv: _____
Date: _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-20-06

ACCOUNT NUMBER 40594989-05

1. **IDENTIFICATION**

Facility Mitchell Item Blade Rings

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☒ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** 5,000

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

#1 Blade Ring L/H - Gov. End - Both stages have minor foreign object damage on discharge side.

#2 Blade Ring L/H - Gov. End - All 3 stages have minor foreign object damage on discharge side.

#2 Blade Ring L/H - Gen End - All 3 stages have minor foreign object damage on discharge side.

#2 Blade Ring L/H - Gov End - All 3 stages - No defect

#2 Blade Ring L/H - Gen End - All 3 stages - No defect

#1 Blade Ring L/H - Gov. End - Both stages have minor foreign object damage on discharge side.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Hurley DATE 4-27-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

MAGNETIC PARTICLE INSPECTION REPORT

@ CMS

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-27-06

ACCOUNT NUMBER 40594989-05

1. **IDENTIFICATION**

Facility Mitchell Item Blade Rings

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☒ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** 5,000

6. **INSPECTION PROCEDURE:** MI-1-S-2-3

7. **INSPECTION SPECIFICATIONS:**

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

Blade Ring # 1 ~~Gen~~ 4/1t - Gen End - Both stages have minor foreign object damage on discharge side.

Blade Ring # 1 - 2/1t - Gen. End - Both stages have minor foreign object damage on discharge side.

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature Doug Staley DATE 4-27-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

66156A0894

CMS

ULTRASONIC TEST REPORT

AMERICAN ELECTRIC POWER
CENTRAL MACHINE SHOP
3100 MacCorkle Avenue, Building 309
South Charleston, WV 25303

WORK ORDER NO. 40594989-05 DATE 4-20-06

1. IDENTIFICATION:
Facility Mitchell Item Blade Ring Studs
PC/SN Unit 1

2. TECHNIQUE:
☒ Straight Beam ☐ Angle Beam ☐ Frequency - ☐ 1 MH ☒ 2.25 MH ☐ 5 MH
☐ Search Angle - ☒ 90° ☐ 45° ☐ 60° ☒ Single Transducer ☐ Dual Transducer

Type of Couplant Exosen 20 Test Unit KrautKramer USK7D

3. CALIBRATION - REFLECTOR TYPE: ☐ Drilled Hole ☐ V. Notch ☐ IIW Block ☐ Other

4. INSPECTION PROCEDURE: MI-1-5-2-4

5. INSPECTION SPECIFICATIONS:

6. TYPE OF INDICATION:
☐ 1. Crack ☐ 2. Lamination ☐ 3. Corrosion/Erosion ☐ 4. Internal Voids ☐ 5. Linear

7. SKETCH/DESCRIPTION:
#1 Blade Ring - Gov End - No cracked studs
#1 Blade Ring - Gen End - No cracked studs. Small stud has bad thread
#2 Blade Ring - Gov End - No cracked studs
#2 Blade Ring - Gen End. 1 small stud has broken top threads

8. INSPECTION PERFORMED BY: (AEP Level II UT Inspector)

Signature Doug Hurley 4-27-06
DATE

9. APPROVED BY: (NDE Supervisor)

Signature _____ DATE

65371A0402

PCMS

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 4-18-06

ACCOUNT NUMBER 40634908-06

1. **IDENTIFICATION**

Facility MC1

PC/SN _____

Item Circulating Water Pump Shafts 1A+B

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent
☐ Non Fluorescent

3. **EQUIPMENT:**

☒ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** 4000

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:** MI-1-5-2-3

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

The Exposed Areas Of The Shaft Were Mag Inspected

No Cracks Were Found

10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

Signature J Cobb DATE 4-18-06

11. **APPROVED BY:** (NDE Supervisor)

Signature _____ DATE _____

SIEMENS

Ohio Power Co
Mitchell {WV}
Unit Number: 1
Outage From: 2006/06/15 to 2006/06/21
Serial Number: 13A3160-1
Frame Type/Building Blocks: 4316VT4
Job Number: 0ZCT06027077

Vibration Analysis

Report Written By: KC Jones

District Service Manager: Carol Andrews

CUSTOMER FINAL REPORT

TABLE OF CONTENTS

1. Summary

1.1 Scope / Introduction

The customer requested a Siemens Balance Engineer to provide vibration analysis and field balancing support during startup of Ohio Power / AEP Mitchell Unit 1 following a scheduled maintenance outage. Siemens Power Generation was not involved with the outage and Siemens personnel were not onsite during the outage. The customer reported the following work was performed during the outage:

* Replaced IP rotor with spare rotor

* Throttle and Governor valve inspection

* Minor Collector work

The Siemens Balance Engineer arrived at site on June 16, 2006.

1.2 Unit Information / Name Plate

Turbine S.O. No: 13A3160-1
Turbine Frame: 4316VT4
Generator S.O. No: 73P0475-1
Exciter S.O. No: 418541

1.3 Equipment Status / Unit Configuration

-Stream Turbine (fossil) - Westinghouse - BB46A-58-73-73 - S.O. 13A3160-1

-Generator - Westinghouse Hydrogen Cooled - Frame-2-112X245

-In Service Date: April 1970

-Rated-816 MVA

-Speed/Grid-3600RPM/60Hz

Customer's Supervisory:

-Bently Nevada 3300 Series

-B/N 200mv Proximity Probes

The turbine generator is equipped with a Bently Nevada (B/N) 3300 vibration monitoring system reading orthogonal (A/B) relative probes on ST bearings #1 through #11. The vibration probes on bearings #1, #2, #3, #9, #10, and #11 are mounted directly on the bearing casing for true relative vibration. The vibration probes on bearings #4, #5, #6, #7, and #8 are mounted directly on the foundation sole plate for shaft vibration relative to foundation. An ST keyphasor ( ) is located between bearings #2 and #3 at a Top Dead Center (TDC) orientation and is designated as 0°.

Please refer to the Bearing Schematic and Probe Location Schematic in Attachment 6.1.

Control Room Equipment:

Ovation

Vibration monitoring - Absolute (unfiltered) Both X and Y Probes all bearing.

1.3 Equipment Status / Unit Configuration {Continued}

Alarm Levels Control Room:

Alarm……7 mils all bearings
Trip…… 10 mils all bearings

Siemens Equipment Used:

-TurboTest connected to Bently X Y Outputs

-Channel A = X Probe Left 135° Brg 1-10

-Channel B =Y Probe Right 135° Brg 1-10

-Channel A = X Probe Left 45° Brg 11

-Channel B =Y Probe Right 45° Brg 11

-Data collected is Not True High Spot

Note: The above listing is correct. The Siemens TurboTest data collector was setup according to customer supplied information for pickup location. The information supplied was incorrect, and resulted in the TurboTest data being swapped for the X and Y locations. Left Side data is actually taken at the right side pickup and vice-versa for all Siemens TurboTest data collected. This correction needs to be taken into account when analyzing the Siemens TurboTest data.

2. Outage Personnel

2.1 Outage Personnel / Customer

Name	Job Description
Jack Huggins	Electrical Process Coordinator

2.2 Outage Personnel / Siemens

Name	Job Description
KC Jones	Field Service Engineer

3. Work Description

Vibration analysis entailed the following activities:
Setup TurboBalancer for data collection during startup and load ascension. Reviewed data and made appropriate balance recommendations

4. Conclusions and Recommendations

The customer's acceptance criteria for rotor vibration is higher than the Siemens recommended levels; therefore, no balance moves were made while the Siemens Vibration Engineer was on site.

The following weight moves are suggested to reach the Siemens vibration acceptance criteria of 3.0 mils 1X filtered. The customer has indexed the shaft at the turning gear area in line with the Bently interruption notch. Angles increase with rotation as viewed from governor end.

HP - Currently the unit has approximately 2.2 mils of static unbalance and 3.0 mils of dynamic unbalance. The following

4. Conclusions and Recommendations {Continued}

weight move is recommended to reduce the dynamic forces.

HP Move: Add 5.0 oz Plane 1 at 70°

IP - The rotor currently has a large amount of static unbalance (4.3) mils and a very small amount of dynamic unbalance. To reach Siemens recommended vibration levels, several weight moves may be required. The initial move would be a center plane balance move with a high likelihood of additional move required in the end planes. If AEP wishes to pursue balancing of the IP rotor, it is recommended that several days be set aside to complete this task. Due to the high probability that several moves will be required, no single move is recommended at this time.

LPA - The rotor has a considerable amount of static unbalance (2.5 to 3.5 mils) and a large amount of dynamic (6.5 mils). The following weight move is recommended to reduce the dynamic forces.

LP A Move: Add 1 Standard 16.0 oz weight Plane 5 at 80°

LPB - This rotor also has a significant amount of static unbalance (2.0 - 2.5 mils) and a small amount of dynamic unbalance. Vibration levels on this rotor are only slightly above the Siemens 3.0 mils 1X criteria. At this time, Siemens feels the benefit of reducing vibration amplitudes on LPB is minimal; therefore, no balance move is recommended. If levels increase, AEP should contact Siemens for assistance in calculating a balance move.

Generator - All vibration amplitudes at the generator bearings are currently below the Siemens recommended amplitudes of 3.0 Mils 1X filtered and require no balancing. Note: The Bently probes are wired incorrectly at both the #9 and #10 bearings - the X and Y are reversed.

Collector - Vibration amplitudes at this bearing have been elevated for some time. Currently vibration level is 5.5 mils. The customer has been controlling this vibration by maintaining a mismatched temperature setting on the hydrogen and air side seal oil. Currently these temperatures are running 116° F hydrogen side and 144° F air side. Siemens recommends operating with the hydrogen side and air side matched at 110° F. The Siemens Balance Engineer requested that these temperatures be matched and the customer elected to match them at 130° F. Vibration at the collector bearing increased to 7.8 mils, so the customer elected to return the temperatures to the mismatched condition in order to reduce the vibration. Note that operating in this condition may thermally distort the generator hydrogen seals. The Siemens Balance Engineer recommended that a balance move be attempted to reduce the vibration amplitude at the collector bearing, however, he did not feel comfortable calculating a move at this time based only on the limited data obtained while at the site. Therefore, Siemens recommends that additional vibration data be captured while the unit is operating with the proper seal oil temperatures. Once this data has been reviewed, Siemens can calculate a balance move for the collector bearing. The customer should be aware that during the balancing effort the seal oil temperatures will have to be maintained at the Siemens recommended setting.

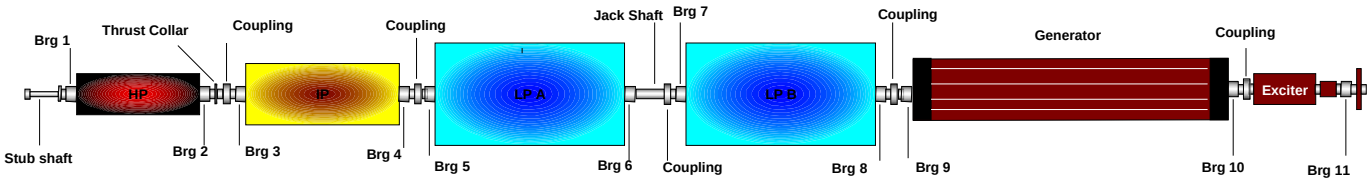
5. Miscellaneous Attachments

N/A

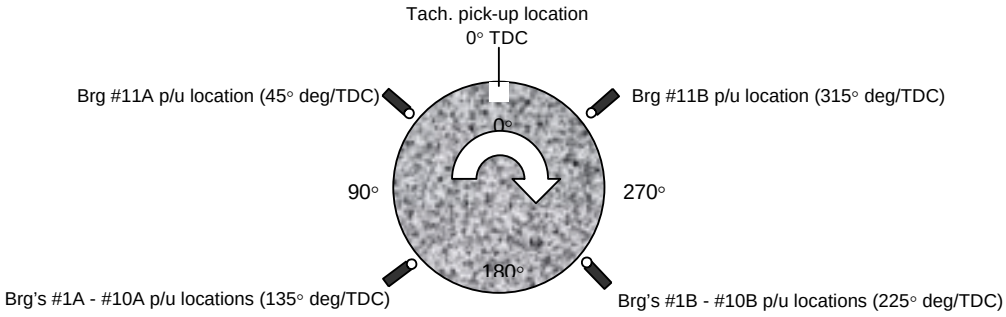
6. Datasheet Attachments

6.1 Mitchell1-2006
6.2 Mitchell Spectral

Bearing Schematic



Probe Location Schematic



ST Probe Orientation from Governor End

TurboTest Setup data:

Machine or Plant Name	Mitchell	Enter a name to describe the machine
Machine Number within Plant	1	Enter an ID to identify the machine
Normal Running Speed	3600	RPM (Numeric value)
Minimum Acquisition Speed	200	RPM (Numeric value)
Maximum Speed for Plots	4000	RPM (Numeric value)
Const Speed Storage Interval	60	Seconds (Numeric value)
Speed Increment for readings	10	RPM (Numeric value)
Store Vibration Spectra ?	N	N= NO any other = YES
Low Speed Acquisition Revs	2	(Numeric value normally 2)
Switch over Speed	600	RPM (Numeric value normally 600)
Normal Acquisition Revs	8	(Numeric value normally 8)
Unit System	Imperial	System of Units (Metric or Imperial)

Set up

Ch	Tag	Signal	XD	mV/EU	Gap V	4larm	Volts	HW	Detect / Display
1	H1FRL	D->D	XBRG1	200	-9.941	5	10	0.5	RMS / P-P
2	H1FRR	D->D	YBRG1	200	-10.605	5	10	0.5	RMS / P-P
3	H1RRL	D->D	XBRG2	200	-10.225	5	10	0.5	RMS / P-P
4	H1RRR	D->D	YBRG2	200	-10.254	5	10	0.5	RMS / P-P
5	I1FRL	D->D	XBRG3	200	-11.074	5	10	0.5	RMS / P-P
6	I1FRR	D->D	YBRG3	200	-10.508	5	10	0.5	RMS / P-P
7	I1RRL	D->D	XBRG4	200	-10.059	5	10	0.5	RMS / P-P
8	I1RRR	D->D	YBRG4	200	-10.117	5	10	0.5	RMS / P-P
9	L1FRL	D->D	XBRG5	200	-10.01	5	10	0.5	RMS / P-P
10	L1RRL	D->D	XBRG6	200	-6.191	5	10	0.5	RMS / P-P
11	L2FRL	D->D	XBRG7	200	-9.033	5	10	0.5	RMS / P-P
12	L2RRL	D->D	XBRG8	200	-6.719	5	10	0.5	RMS / P-P
13	G1TRL	D->D	XBRG9	200	-8.262	5	10	0.5	RMS / P-P
14	G1XRL	D->D	XBRG10	200	-10.498	5	10	0.5	RMS / P-P
15	X1RRL	D->D	XBRG11	200	-10.156	5	10	0.5	RMS / P-P
16	X1RRR	D->D	YBRG11	200	-10.508	5	10	0.5	RMS / P-P

"As Found" / "As Left" TurboTest data 800MW

SOURCE		DC		TOTAL	FILTER 1X		FILTER 2X		FILTER 0.125X	
CH	TAG	VOLTS	OK	AMP	AMP	ANG	AMP	ANG	AMP	UNITS
1	H1FRL	-10.598	IIIII	1.71	1.63	197	0.14	195	0.15	Mils P-P
2	H1FRR	-11.904	IIIII	1.24	1.20	281	0.12	163	0.03	Mils P-P
3	H1RRL	-10.532	IIIII	2.77	2.71	268	0.10	128	0.16	Mils P-P
4	H1RRR	-10.518	IIIII	3.17	3.15	346	0.12	81	0.11	Mils P-P
5	I1FRL	-12.165	IIIII	2.87	2.78	211	0.13	308	0.05	Mils P-P
6	I1FRR	-12.133	IIIII	3.16	3.08	312	0.36	108	0.11	Mils P-P
7	I1RRL	-11.269	IIIII	4.13	4.09	200	0.25	319	0.07	Mils P-P
8	I1RRR	-10.670	IIIII	4.28	4.26	286	0.23	75	0.05	Mils P-P
9	L1FRL	-10.989	IIIII	4.28	4.24	149	0.31	251	0.01	Mils P-P
10	L1RRL	-7.001	IIIII	4.39	4.34	66	0.46	344	0.05	Mils P-P
11	L2FRL	-9.290	IIIII	3.27	3.24	60	0.22	62	0.01	Mils P-P
12	L2RRL	-7.899	IIIII	2.97	2.91	137	0.56	150	0.01	Mils P-P
13	G1TRL	-11.260	IIIII	0.88	0.28	141	0.32	293	0.02	Mils P-P
14	G1XRL	-12.601	IIIII	1.07	0.17	348	0.98	356	0.01	Mils P-P
15	X1RRL	-8.030	IIIII	5.06	5.05	318	0.33	216	0.03	Mils P-P
16	X1RRR	-8.240	IIIII	4.75	4.74	265	0.08	273	0.04	Mils P-P

Location TurboTest	Brg 1	Brg 2	Brg 3	Brg 4	Brg 5	Brg 6	Brg 7	Brg 8	Brg 9	Brg 10	Brg 11
X	1.5/199	2.8/265	2.7/211	4.2/285	4.2/147	4.5/66	3.5/58	3.0/136	0.2/171	0.1/18	5.2/319
Y	1.1/280	3.2/344	4.0/197	4.2/148	4.9/256	3.4/155	2.1/147	1.4/177	0.5/347	0.1/17	4.7/265
Runout Comp TurboTest											
X	0.4/170	3.4/267	3.5/296	3.4/280	1.4/95	2.2/75	4.7/60	3.9/194	NA	NA	NA
Y	2.1/288	4.1/335	4.3/206	5.0/155	NA	NA	NA	NA	NA	NA	NA
PIE Unfiltered											
LS	1.5/283	3.6/345	3.0/311	4.7/285	5.0/260	3.6/154	2.5/148	1.8/174	1.6/353	1.6/257	4.9/266
RS	1.8/202	3.2/268	3.6/213	4.5/200	4.7/149	4.6/67	3.6/61	3.3/137	1.4/134	1.4/358	5.4/318

Note: NA = No data available or runout minimal

"As Left" Bearing Metal and Oil Temperatures 800MW:

location	Metal F.
Brg 1	177.9°F
Brg 2	187.1°F
Brg 3	150.6°F
Brg 4	149.5°F
Brg 5	191.5°F
Brg 6	196.5°F
Brg 7	198.3°F
Brg 8	189.1°F
Brg 9	163.7°F
Brg 10	165.2°F
Brg 11	146.3°F
Cooler out	124.4°F
Cooler In	162°F
Air Side SO	144°F
Hydro Side SO	116°F

TurboTest log:

6:Jun:2006 - 09:01 Create new job.

16:Jun:2006 - 09:02 Create data volume 1 - BIG MITCHELL UNIT 1 AEP KC JONES 6/16/2006 IP SPARE ROTOR INSTALLED

16:Jun:2006 - 23:59 Vol1.vec rdg 34---> first steam roll

17:Jun:2006 - 09:04 Vol1.vec rdg 536---> unit trip generator problems

17:Jun:2006 - 15:45 Vol1.vec rdg 1210---> on line

17:Jun:2006 - 15:51 Vol1.vec rdg 1211---> 40MW

17:Jun:2006 - 16:15 Vol1.vec rdg 1217---> 19MW

17:Jun:2006 - 16:56 Vol1.vec rdg 1225---> 38MW

18:Jun:2006 - 06:57 Vol1.vec rdg 1393---> 330MW

18:Jun:2006 - 09:09 Vol1.vec rdg 1419---> 434MW

18:Jun:2006 - 09:50 Vol1.vec rdg 1429---> 417MW

18:Jun:2006 - 11:49 Vol1.vec rdg 1452---> 458MW

18:Jun:2006 - 12:17 Vol1.vec rdg 1458---> 476MW

18:Jun:2006 - 13:18 Vol1.vec rdg 1470---> 480MW

18:Jun:2006 - 13:43 Vol1.vec rdg 1475---> 360MW

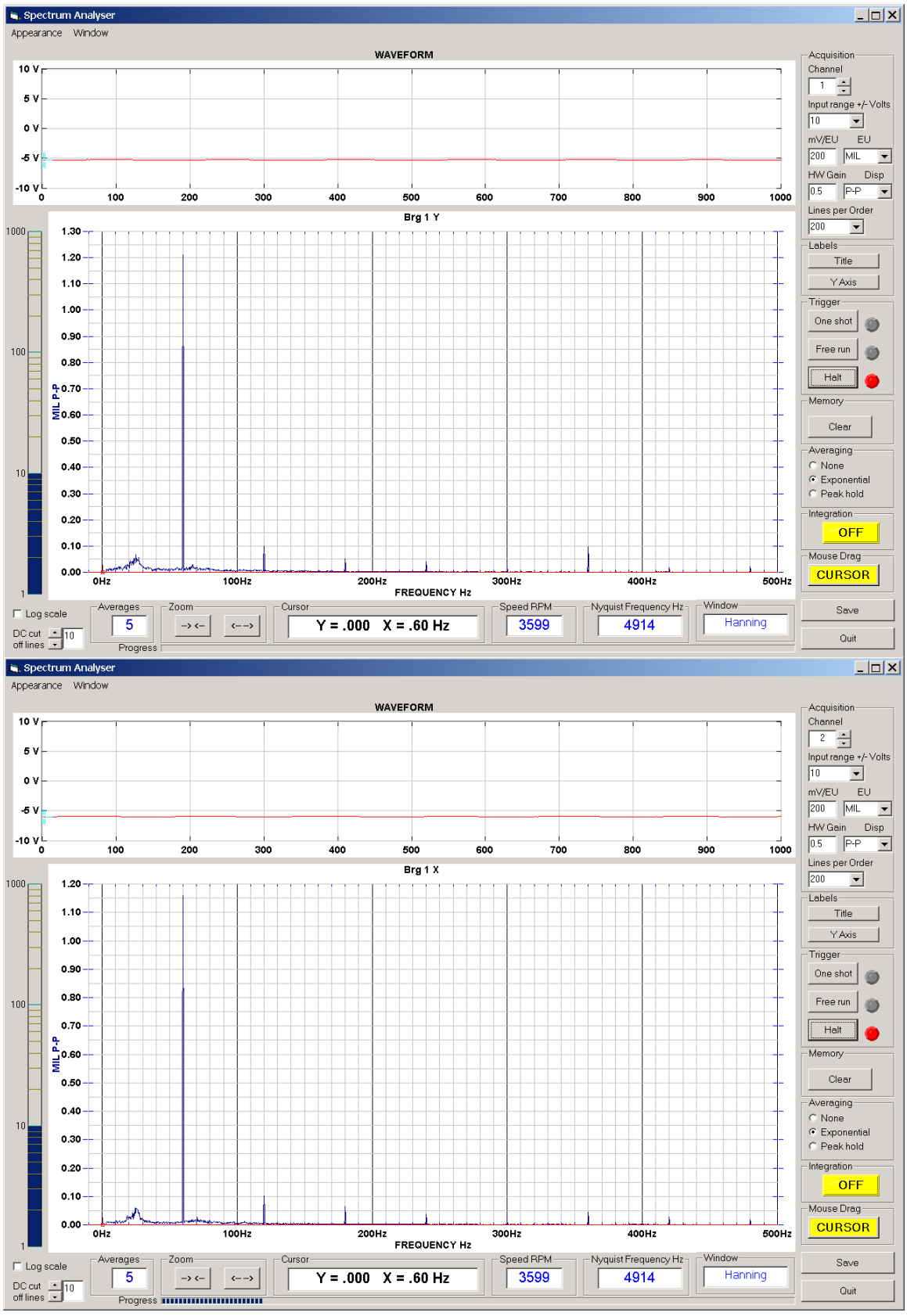
19:Jun:2006 - 07:05 Vol1.vec rdg 1684---> 688MW

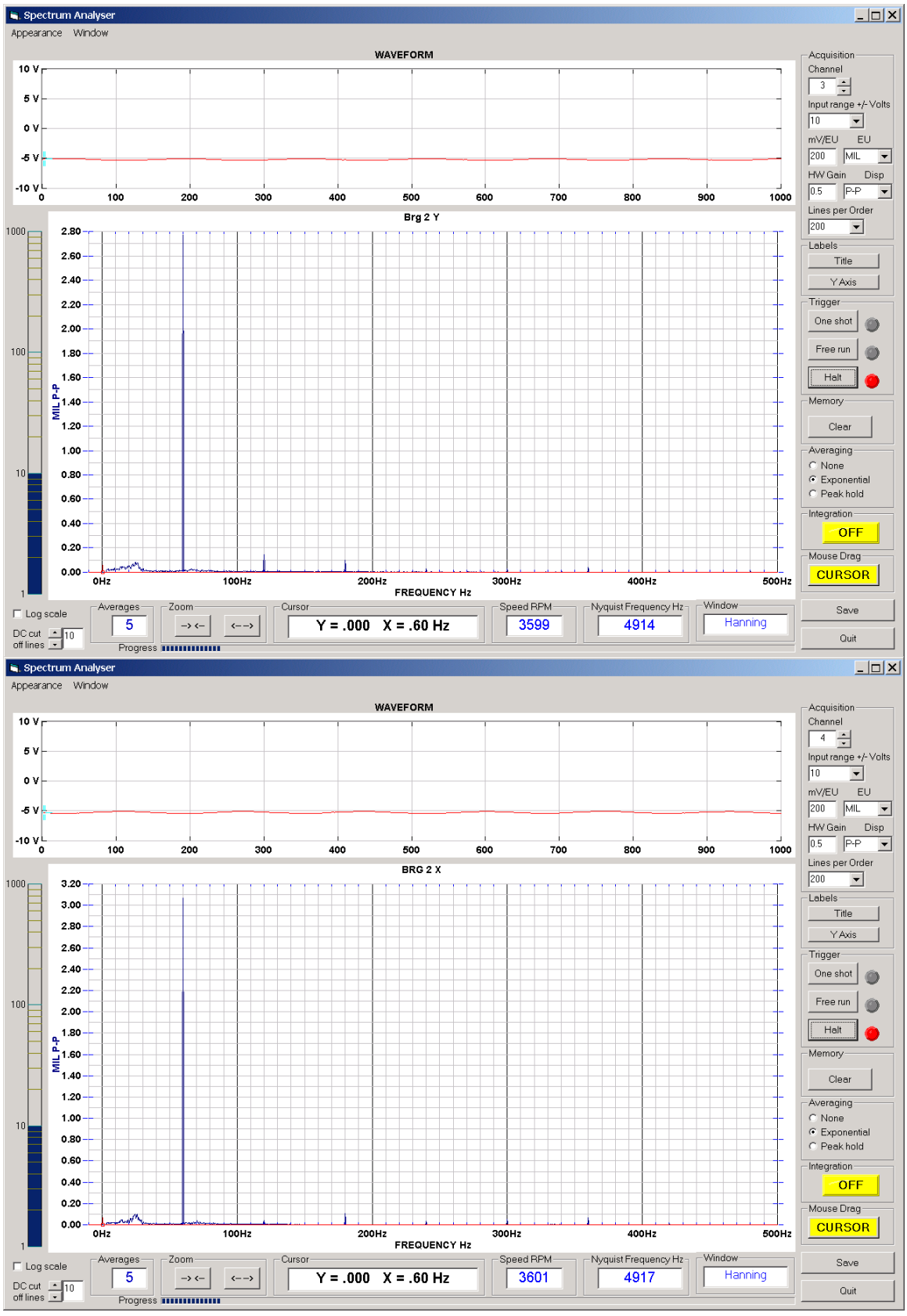
19:Jun:2006 - 07:10 Vol1.vec rdg 1685---> 711MW

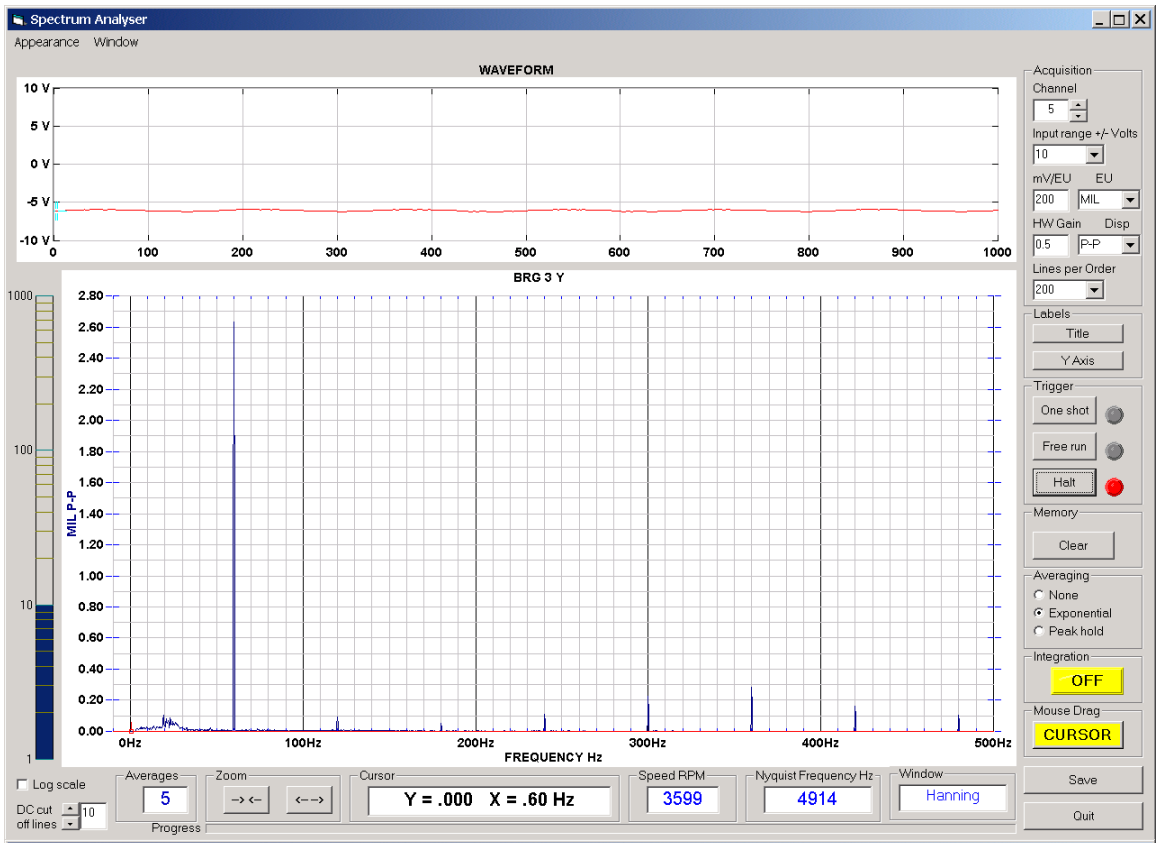
19:Jun:2006 - 07:15 Vol1.vec rdg 1686---> 740MW

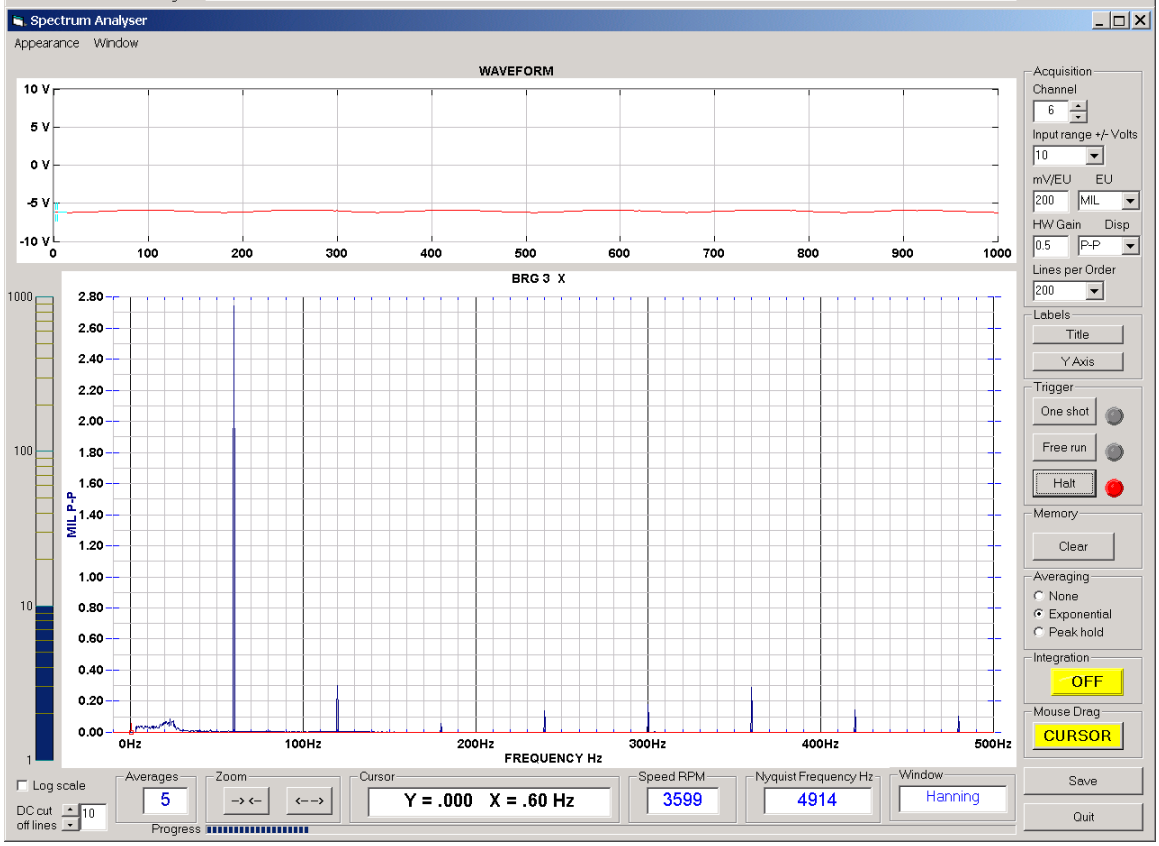
19:Jun:2006 - 09:40 Vol1.vec rdg 1799---> 790MW

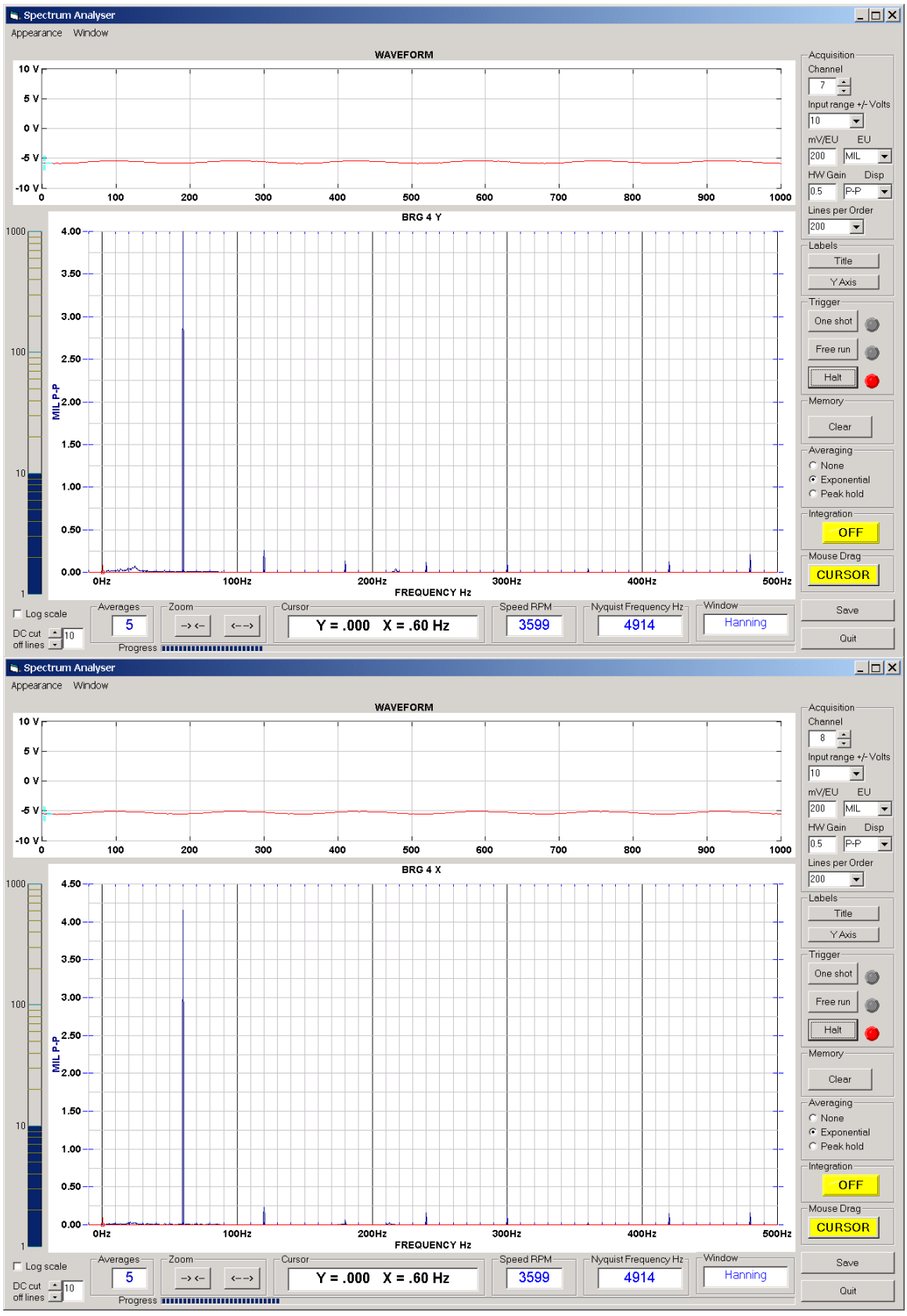
19:Jun:2006 - 10:56 Vol1.vec rdg 1873---> 800MW

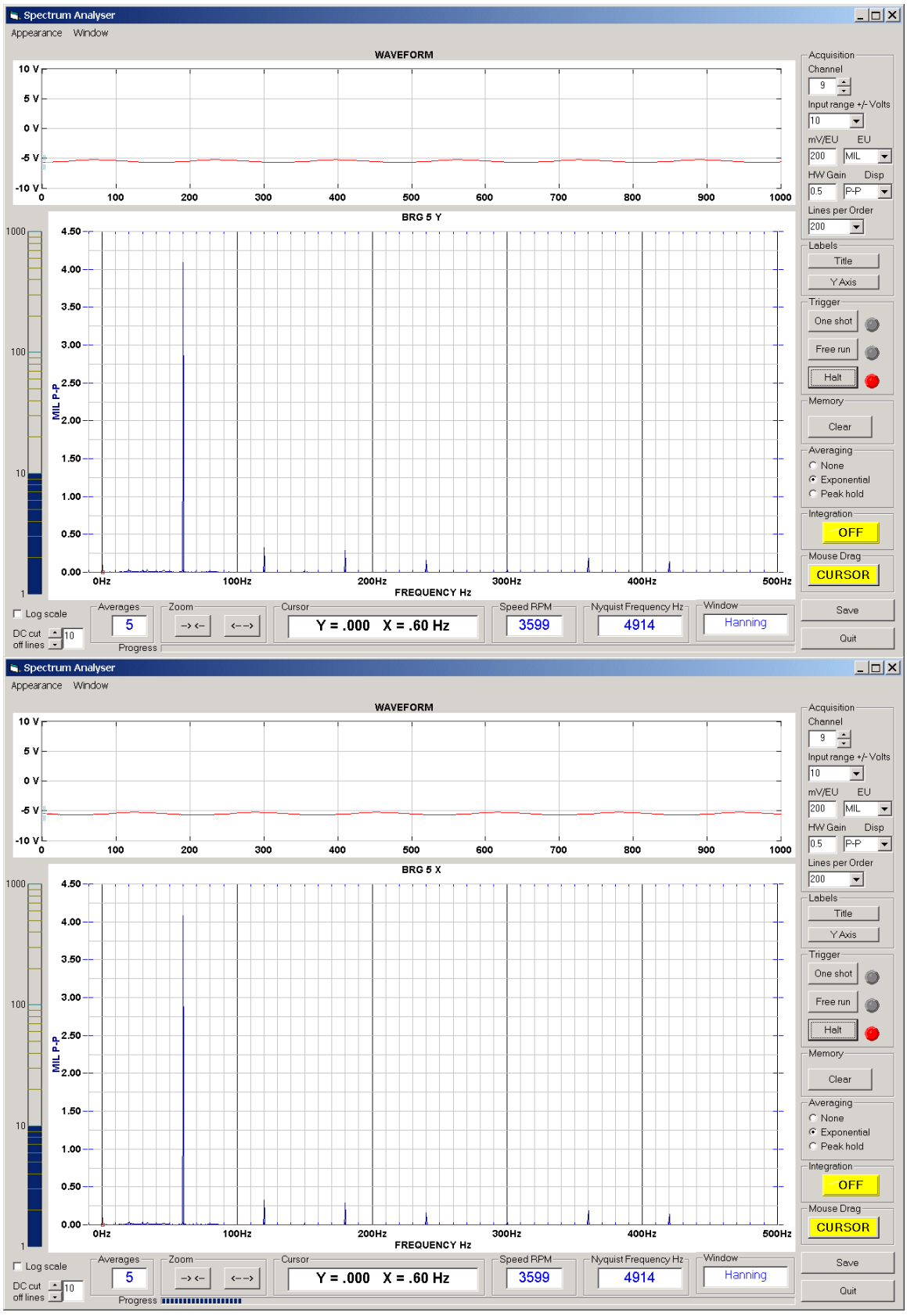

Spectrum Analyser
Appearance Window
WAVEFORM
Brg 1 Y
MIL P-P
FREQUENCY Hz
Acquisition
Channel
Input range +/- Volts
mV/EU EU
HW Gain Disp
Lines per Order
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines
Averages
Zoom
Cursor
Y = .000 X = .60 Hz
Speed RPM
3599
Nyquist Frequency Hz
4914
Window
Hanning
Progress
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
Brg 1 X
MIL P-P
FREQUENCY Hz
Acquisition
Channel
Input range +/- Volts
mV/EU EU
HW Gain Disp
Lines per Order
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines
Averages
Zoom
Cursor
Y = .000 X = .60 Hz
Speed RPM
3599
Nyquist Frequency Hz
4914
Window
Hanning
Progress
Save
Quit

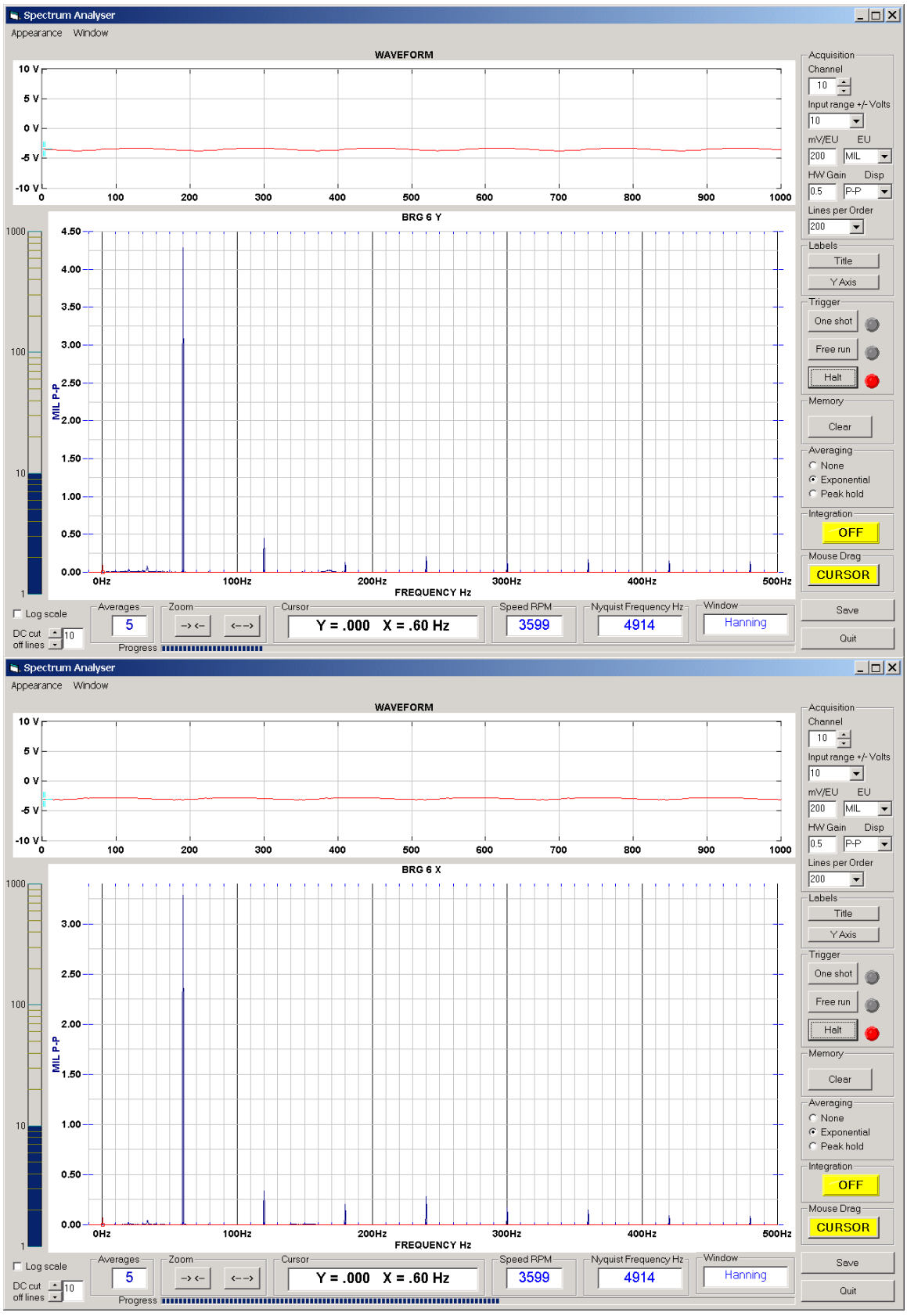

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
Brg 2 Y
MIL P-P
2.80 2.60 2.40 2.20 2.00 1.80 1.60 1.40 1.20 1.00 0.80 0.60 0.40 0.20 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 3
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 2 X
MIL P-P
3.20 3.00 2.80 2.60 2.40 2.20 2.00 1.80 1.60 1.40 1.20 1.00 0.80 0.60 0.40 0.20 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 4
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3601
Nyquist Frequency Hz 4917
Window Hanning
Save
Quit

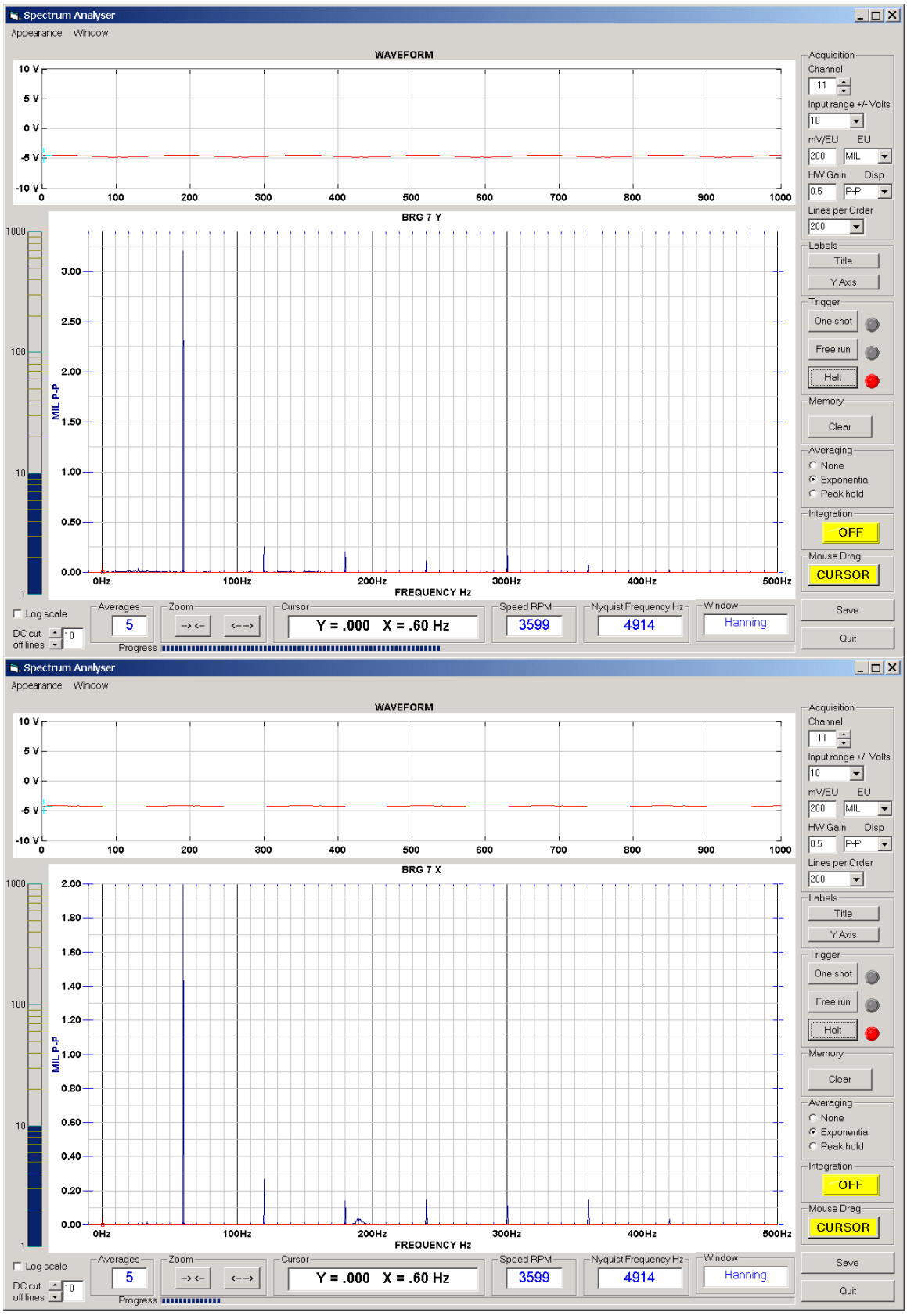

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 3 Y
MIL P-P
2.80 2.60 2.40 2.20 2.00 1.80 1.60 1.40 1.20 1.00 0.80 0.60 0.40 0.20 0.00
1000 100 10 1
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 5
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit

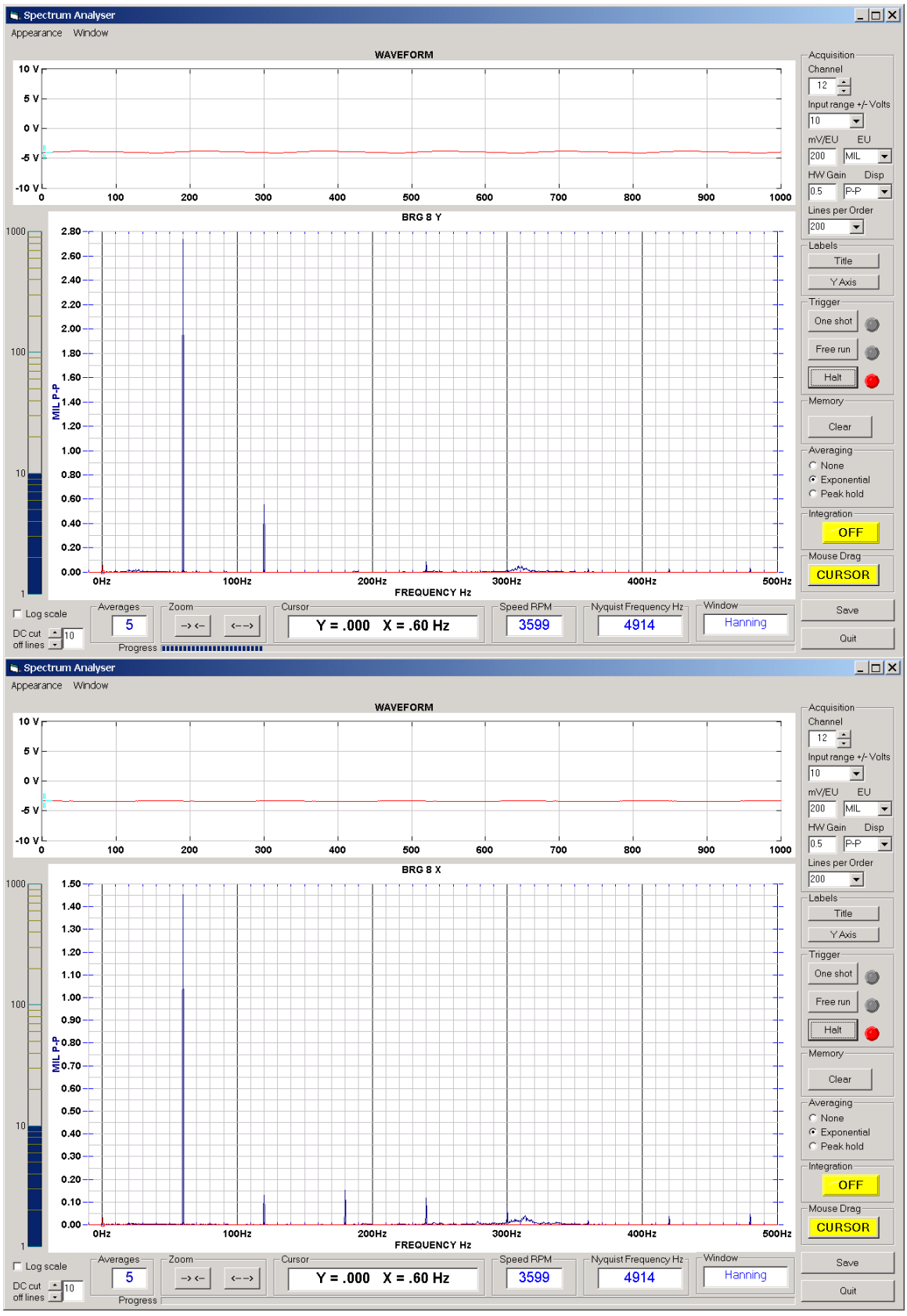

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 3 X
MIL P-P
2.80 2.60 2.40 2.20 2.00 1.80 1.60 1.40 1.20 1.00 0.80 0.60 0.40 0.20 0.00
1000 100 10 1
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 6
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit

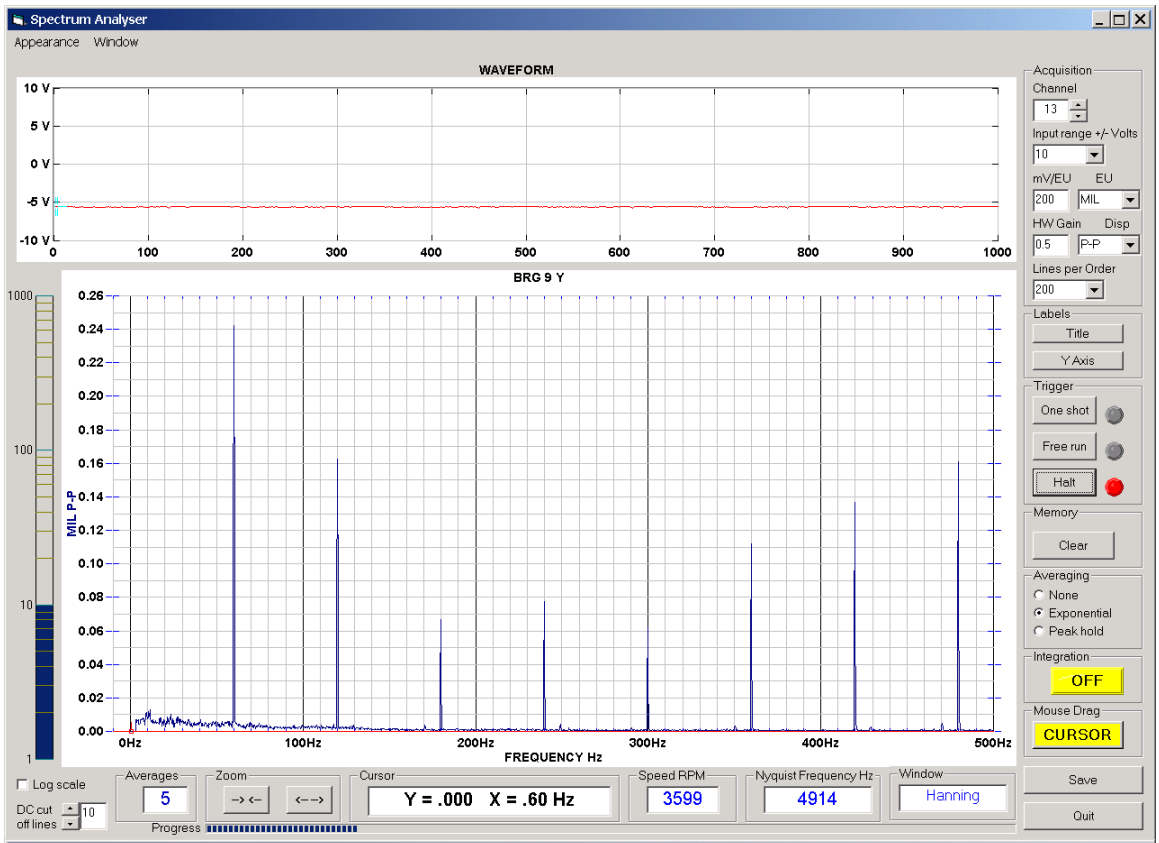

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 4 Y
MIL P-P
4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 7
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
BRG 4 X
Acquisition
Channel 8
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit

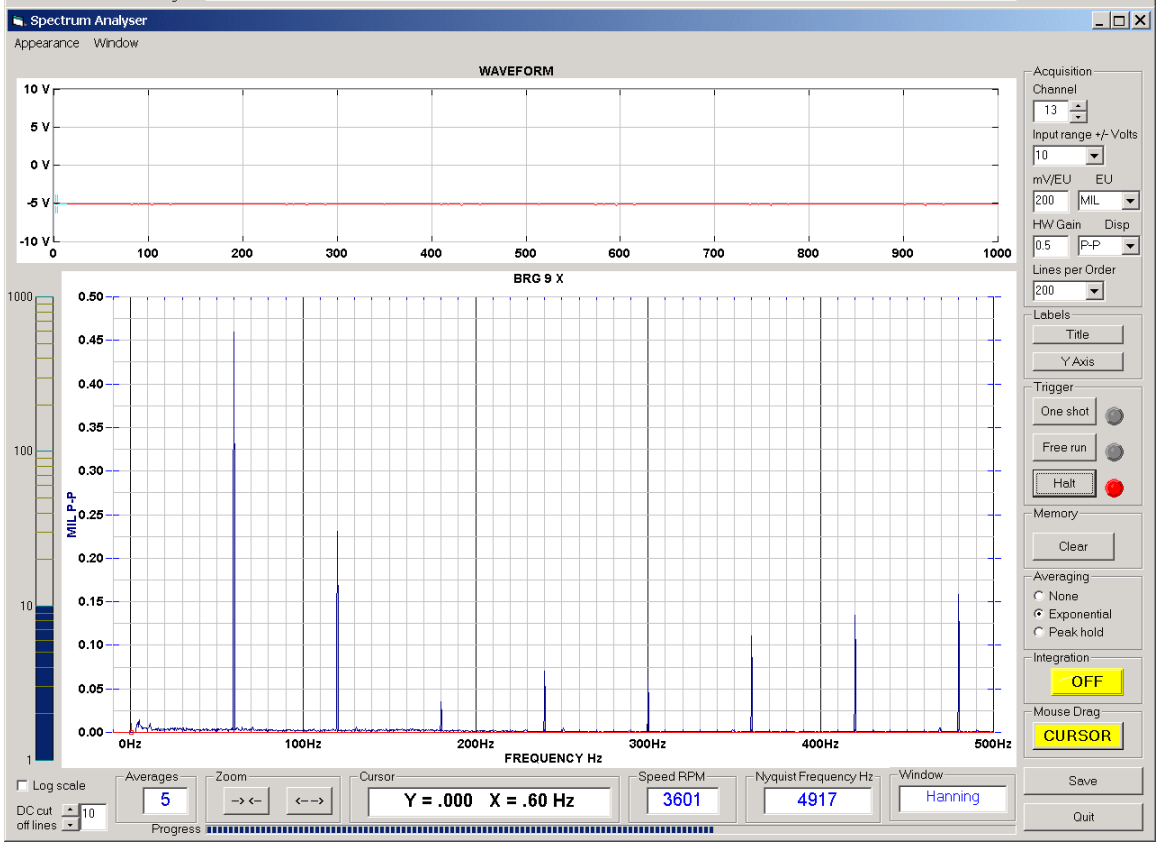

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 5 Y
MIL P-P
4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 9
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
BRG 5 X
FREQUENCY Hz
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit

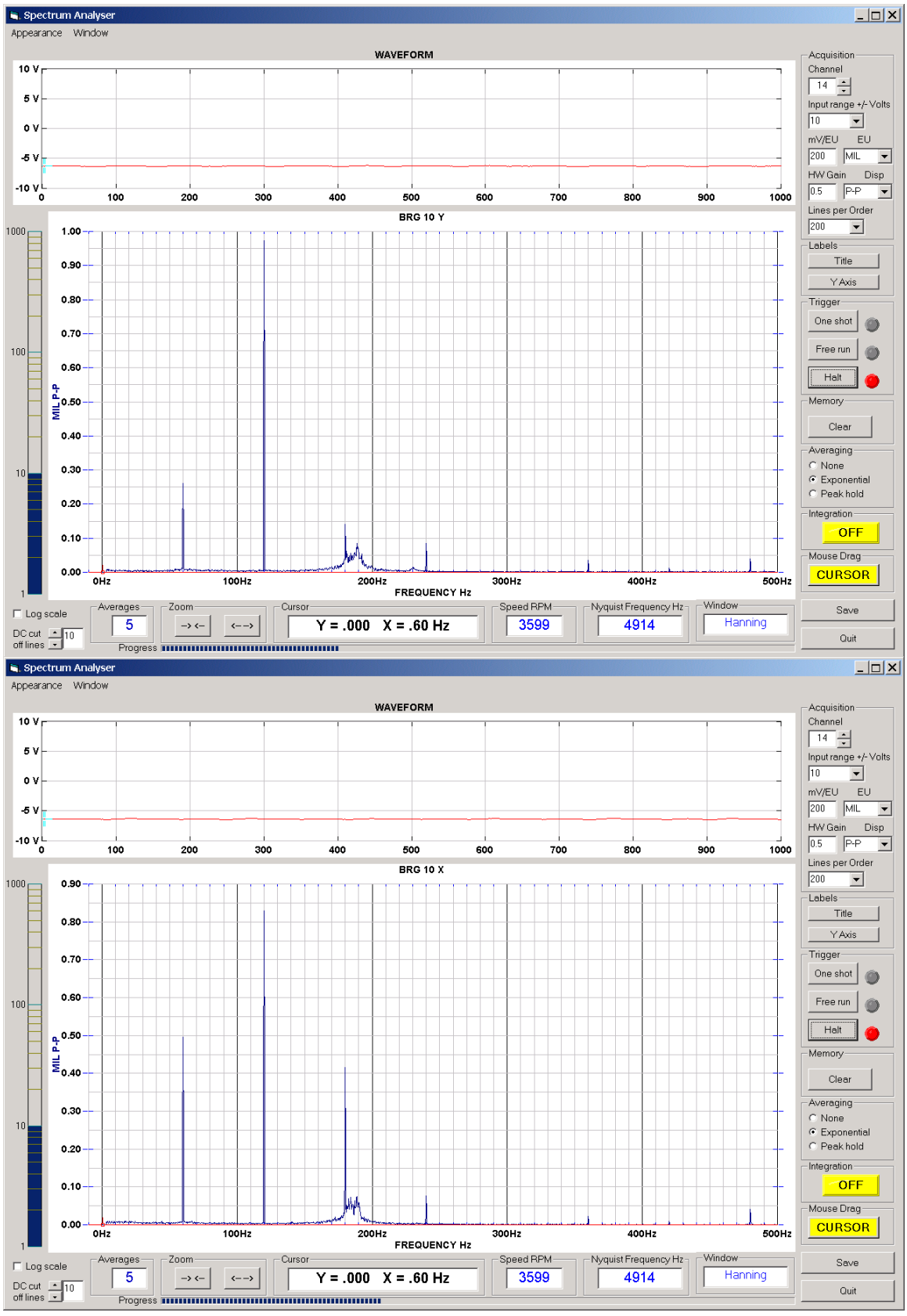

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 6 Y
MIL P-P
4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 10
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
BRG 6 X
MIL P-P
FREQUENCY Hz
Acquisition
Channel 10
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit

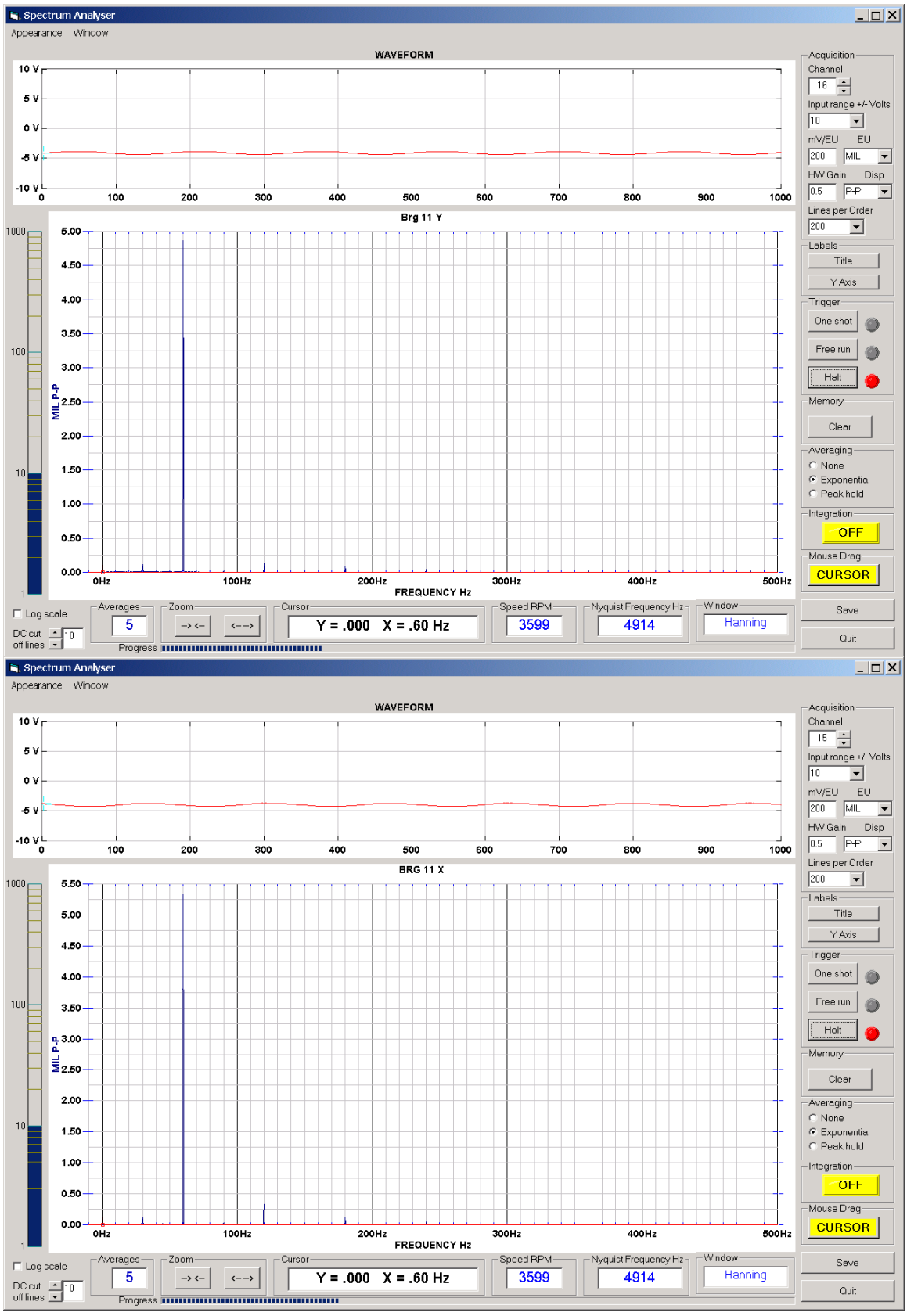

Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 7 Y
MIL P-P
3.00 2.50 2.00 1.50 1.00 0.50 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 11
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
BRG 7 X
MIL P-P
2.00 1.80 1.60 1.40 1.20 1.00 0.80 0.60 0.40 0.20 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 11
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit


Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 8 Y
MIL P-P
2.80 2.60 2.40 2.20 2.00 1.80 1.60 1.40 1.20 1.00 0.80 0.60 0.40 0.20 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 12
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 8 X
MIL P-P
1.50 1.40 1.30 1.20 1.10 1.00 0.90 0.80 0.70 0.60 0.50 0.40 0.30 0.20 0.10 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 12
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit


Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 9 Y
MIL P-P
0.26 0.24 0.22 0.20 0.18 0.16 0.14 0.12 0.10 0.08 0.06 0.04 0.02 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 13
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit


Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 9 X
MIL P-P
0.50 0.45 0.40 0.35 0.30 0.25 0.20 0.15 0.10 0.05 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 13
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3601
Nyquist Frequency Hz 4917
Window Hanning
Save
Quit


Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 10 Y
MIL P-P
1000 100 10 1
1.00 0.90 0.80 0.70 0.60 0.50 0.40 0.30 0.20 0.10 0.00
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 14
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
BRG 10 X
FREQUENCY Hz
Log scale
DC cut off lines 10
Averages 5
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit


Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
Brg 11 Y
MIL P-P
5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
1000 100 10 1
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 16
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit
Spectrum Analyser
Appearance Window
WAVEFORM
10 V
5 V
0 V
-5 V
-10 V
0 100 200 300 400 500 600 700 800 900 1000
BRG 11 X
MIL P-P
5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00
1000 100 10 1
0Hz 100Hz 200Hz 300Hz 400Hz 500Hz
FREQUENCY Hz
Acquisition
Channel 15
Input range +/- Volts 10
mV/EU 200 EU MIL
HW Gain 0.5 Disp P-P
Lines per Order 200
Labels
Title
Y Axis
Trigger
One shot
Free run
Halt
Memory
Clear
Averaging
None
Exponential
Peak hold
Integration
OFF
Mouse Drag
CURSOR
Log scale
DC cut off lines 10
Averages 5
Progress
Zoom
Cursor Y = .000 X = .60 Hz
Speed RPM 3599
Nyquist Frequency Hz 4914
Window Hanning
Save
Quit

7. Photo Attachments

N/A

THE AMERICAN ELECTRIC POWER SERVICE CORPORATION
TRAVELER

PLANT & UNIT: (MLU106-017) Mitchell Plant Unit -1

INSPECTOR PHONE APPROVAL:

JOB NO.: 40634913-06

APPLICABLE CODE: B31.1

DATE: 5/9/2006

Operating TEMP & PRESSURE (B31.1): Oil Pipe: 140 °F. @ 380 psi, Guard Pipe: ambient and 6" vacuum

REPAIR DESCRIPTION & LOCATION: **Turbine Main Oil Pump Suction and Discharge Piping – reweld joint approximately 14 feet below turbine front standard pedestal floor.**

AREA	*HOLD POINT	QCC AUDIT	*INSPECTOR RELEASE	MAINTENANCE RELEASE
1. DESIGN		Wayne Hafer 5-24-06		R. Pederson RP 5/9/06
2. MATERIAL A. ORIGINAL		JWP 5-24-06		R. Pederson RP 5/9/06
B. REPLACEMENT		N/A		N/A
3. QUALIFICATIONS A. WELD PROCEDURE		JWP 5-24-06		R. Pederson RP 5/9/06
B. WELDER		JWP 5-24-06		" RP 5/24/06
C. NDE PERSONNEL		JWP 5-24-06		" RP 5/24/06
D. HEAT TREATMENT		N/A		N/A
4. REPAIR A. END PREPARATION				" RP 5/24/06
B. FITUP/ALIGNMENT				" RP 5/24/06
C. PREHEAT		JWP 5-24-06		" RP 5/24/06
D. WELD (VISUAL)				" RP 5/24/06
NDE		JWP N/A 5-24-06		N/A
F. PWHT		JWP N/A 5-24-06		N/A
5. PRESSURE TEST Pressure: Medium:				None

6. DOCUMENTS

1. Drawings, Specs., etc.:	Metal analysis provided by CMS		
Weld Size (Fillet/Seal):			
2A. Size, Spec. and Grade:	Oil Pipe: 5" & 8" Sch 40 (3/8" wall) A106 Gr B, Guard Pipe: 14" Sch 40 A106 Gr B, – (4 cut access ports to 5" & 8" pipes inside)		
2B. Size, Spec, Grade, & P. O. No.:			
3A. WPS No.:	**1.2a**		
3B. Welder's Name and Stamp:	~~See Attached Sheet~~ J. Reitter		
3C. NDE Personnel Name, Method & Exp. Date:	**VT by:** D. Graley (Exp. 2/1/07, MT by: D. Graley (Exp 2/1/07)		
3D. Temp Range:	**N/A**	Heat Rate (Max):	**N/A**
Cool Rate (Max):	**N/A**	Hold Time (Min):	**N/A**
4C. Min Preheat Temp:	**50° F.**		
4D. Electrode/Rods:	E 7018		

* PLANT MAINTENANCE SUPERVISION: NOTIFY QCC AND STOP FABRICATION AT ALL HOLD POINTS.
INDICATE THE REQUIRED HOLD POINTS BY INITIALS. INDICATE RELEASE OF HOLD POINTS BY INITIALS.
NOTE: INDIVIDUALS WILL INITIAL AND DATE TO SIGNIFY COMPLETION.

PLANT QC ACCEPTANCE:

INSPECTOR ACCEPTANCE: (When reviewed)

6 welds
6 MT
6 RT's

MATERIAL	Carbon Steel, P-1 & S-1
PROCESS	SMAW
FILLER METAL	E7018 E7018-A1 E7015 E7015-A1 E7016 E7016-A1
GAS	**SHIELD** N/A **PURGE** N/A
JOINT DESIGN	JD-2, JD-3, JD-4, JD-5 (girth only for Sec. I) & JD-10 (welding neck w/backing)
POSITION	All
PREHEAT	50° F min. 175° F min. for mat'l with both C over 0.30% and T over 1" (VIII) 200° F min. for mat'l with T over 1-1/4" (VIII)
INTERPASS TEMP.	500° F max. recommended
POST HEAT	Not required

WELD DATA

Pass	Dia.	E70XX & A1
1 & over	3/32"	65-110 amps
1 & over	1/8"	100-165 amps
3 & over	5/32"	140-220 amps

TECHNIQUE	Stringer bead* Vertical upward progression
QUALIFICATION (PQR)	(107) & (358) Base metal: 1/16 to 3/4" (I & B31.1), 1/16 to 1-1/2" (VIII) Weld max: 3/4" (I & B31.1), 1-1/2" (VIII)
MISCELLANEOUS	B31.1, I & VIII also approved for Ohio Piping. * Refer to General Welding Instruction No. 1 and also for general information.

03/02/2000

FOSSIL	**WELDING PROCEDURE SPECIFICATION** NO. 1.2a	SMAW B31.1, I & VIII Carbon Steel, P-1 E7018 Backed Groove

PREPARED BY J M Andress DATE 4/20/01

QC APPROVAL D D Eilers DATE 4-20-01

AMERICAN ELECTRIC POWER

MATERIAL	Carbon Steel, P-1 & S-1
PROCESS	SMAW
FILLER METAL	E7018 E7018-A1 E7015 E7015-A1 E7016 E7016-A1
GAS	**SHIELD** N/A **PURGE** N/A
JOINT DESIGN	JD-2, JD-3, JD-4, JD-5 (girth only for Sec. I) & JD-10 (welding neck w/backing)
POSITION	All
PREHEAT	50° F min. 175° F min. for mat'l with both C over 0.30% and T over 1" (VIII) 200° F min. for mat'l with T over 1-1/4" (VIII)
INTERPASS TEMP.	500° F max. recommended
POST HEAT	Not required

WELD DATA

Pass	Dia.	E70XX & A1
1 & over	3/32"	65-110 amps
1 & over	1/8"	100-165 amps
3 & over	5/32"	140-220 amps

TECHNIQUE	Stringer bead* Vertical upward progression
QUALIFICATION (PQR)	(107) & (358) Base metal: 1/16 to 3/4" (I & B31.1), 1/16 to 1-1/2" (VIII) Weld max: 3/4" (I & B31.1), 1-1/2" (VIII)
MISCELLANEOUS	B31.1, I & VIII also approved for Ohio Piping. * Refer to General Welding Instruction No. 1 and also for general information.

03/02/2000

FOSSIL	**WELDING PROCEDURE SPECIFICATION** NO. 1.2a	SMAW B31.1, I & VIII Carbon Steel, P-1 E7018 Backed Groove

PREPARED BY J M Andress DATE 4/20/01

QC APPROVAL D D Eilers DATE 4-20-01

AMERICAN ELECTRIC POWER

ALLOY ANALYZER INSPECTION REPORT
AEP - CMS
3100 MacCorkle Ave. Building 309
South Charleston, WV 25303

Traveler No. MLU106-017

CMS NO:
ACT NO:
FACILITY: Mitchell - U1
ITEM: Main Oil Pump - Inlet - Outlet
PC/SN Suction & Discharge
Below Front Standard

Al - Aluminum
C - Carbon
Co - Cobalt
Cr - Chromium
Cu - Copper
Fe - Iron
Mn - Manganese
Mo - Molybdenum
Nb - Niobium
Ni - Nickel
Pb - Lead
Sn - Tin
Ti - Titanium
V - Vanadium
W - Tungsten
Zn - Zinc

DESCRIPTION	C	Co	Cr	Cu	Fe	Mn	Mo	Nb	Ni	Ti	W		
					97.23	.37	0.03						
Mild Steel													

Analysis Performed By: Doug Dooley

Date: 5-8-06

NDE Supv: _____

Date: _____

MAGNETIC PARTICLE INSPECTION REPORT

AMERICAN ELECTRIC POWER
Central Machine Shop
3100 MacCorkle Avenue, Bldg. 309
South Charleston, West Virginia 25303

CMS NUMBER _____ DATE 5-11-06

ACCOUNT NUMBER _____

1. **IDENTIFICATION**

Facility Mitchell Item Main Oil Pump Suction & Discharge Leg Welds

PC/SN Unit 1

2. **TECHNIQUE:**

☐ Dry Powder ☒ Wet Fluorescent ☐ Non Fluorescent

3. **EQUIPMENT:**

☐ Coil ☐ Prods ☐ Yoke ☐ Clamps

4. **CURRENT TYPE:** ☒ AC ☐ DC

5. **AMP TURNS -** Parker Probe

6. **INSPECTION PROCEDURE:** MI-1-5-2-3

7. **INSPECTION SPECIFICATIONS:** _____

8. **TYPE OF INDICATION FOUND:**

☐ 1. Crack ☐ 2. Linear Surface ☐ 3. Linear Subsurface ☐ 4. Undercut ☐ 5. Non Relevant

9. **SKETCH/DESCRIPTION:**

A magnetic particle inspection was performed to the weld on each line. Results showed no defects.

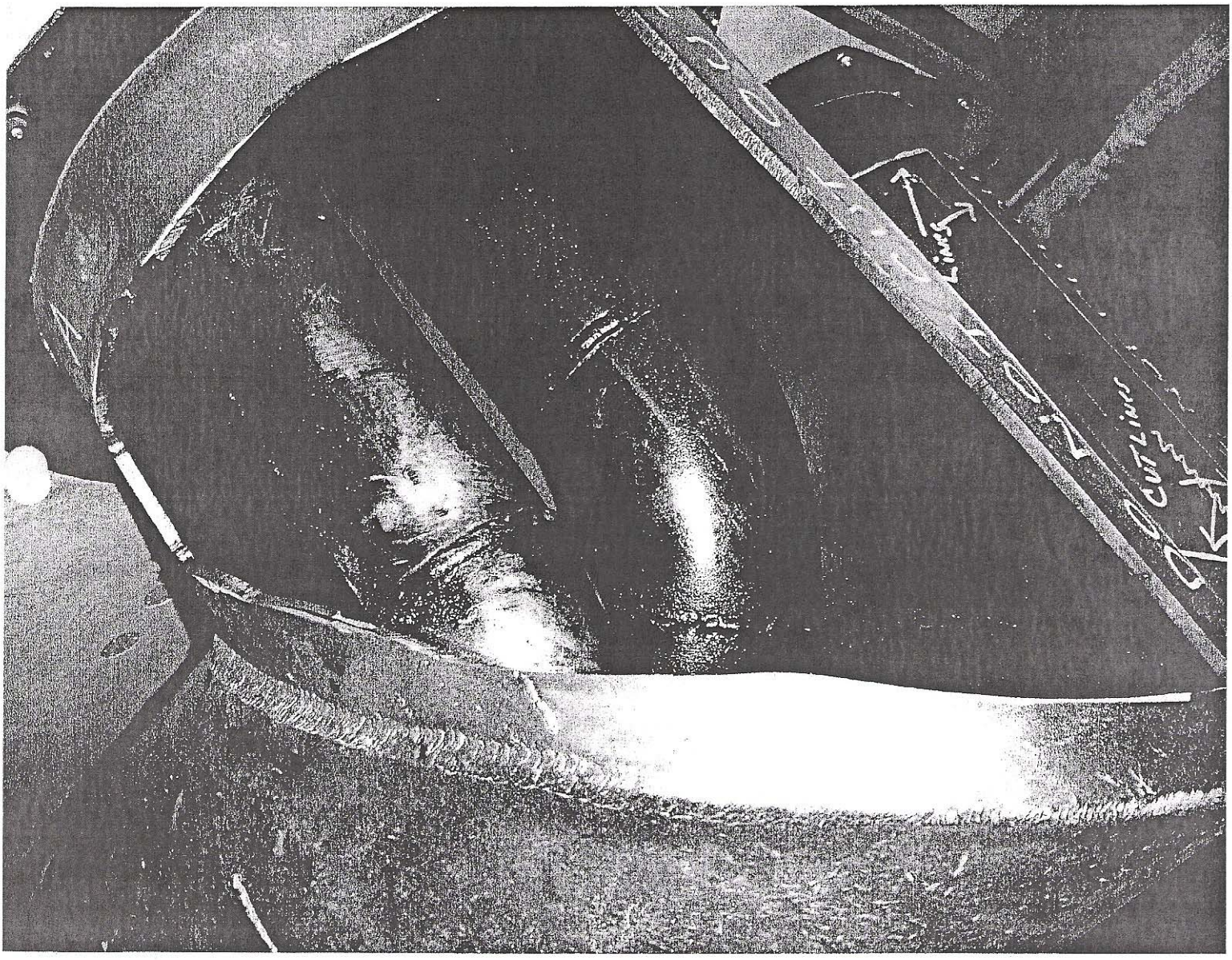
10. **INSPECTION PERFORMED BY:** (AEP Level II MT Inspector)

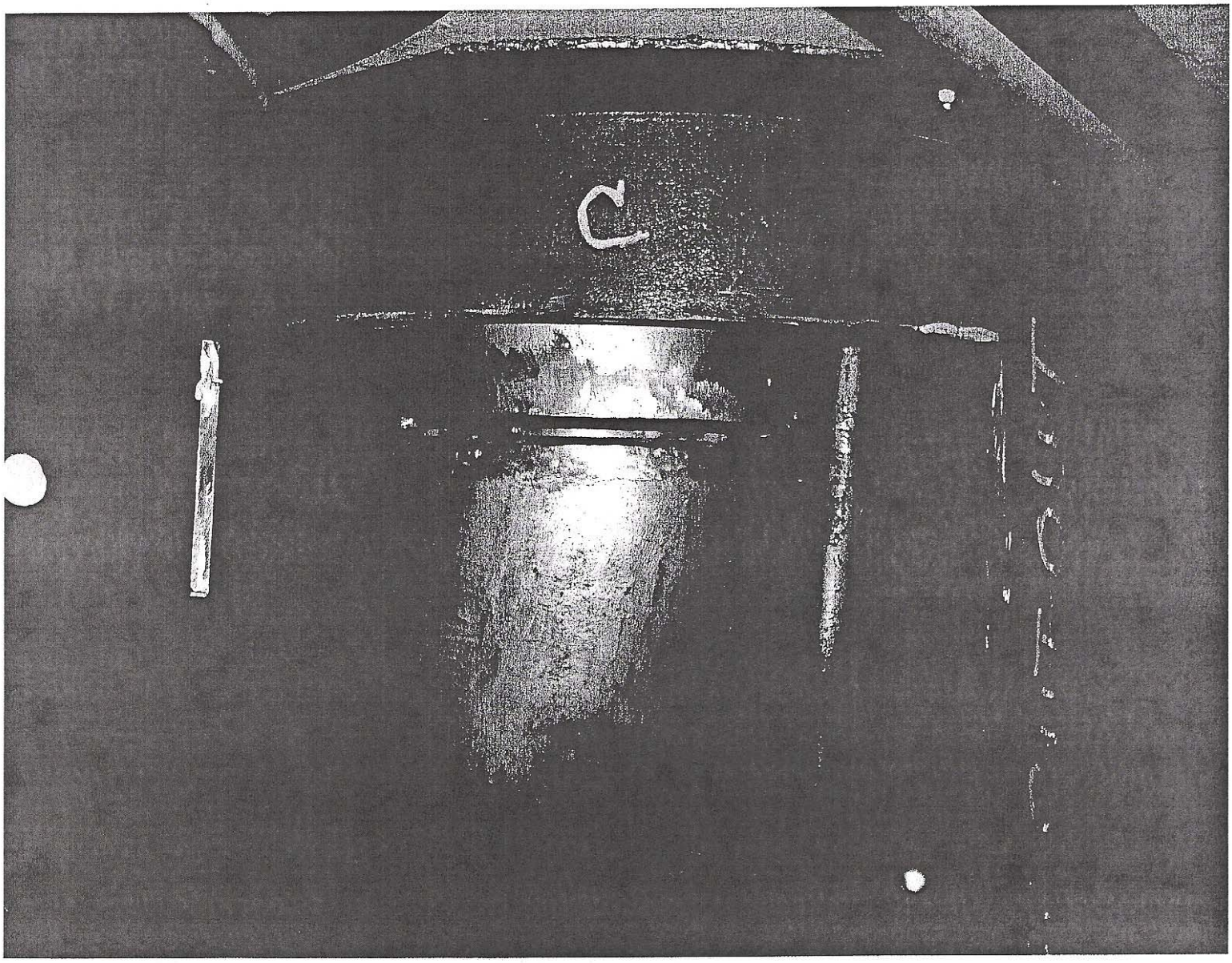
Signature Doug Dealey DATE 5-11-06

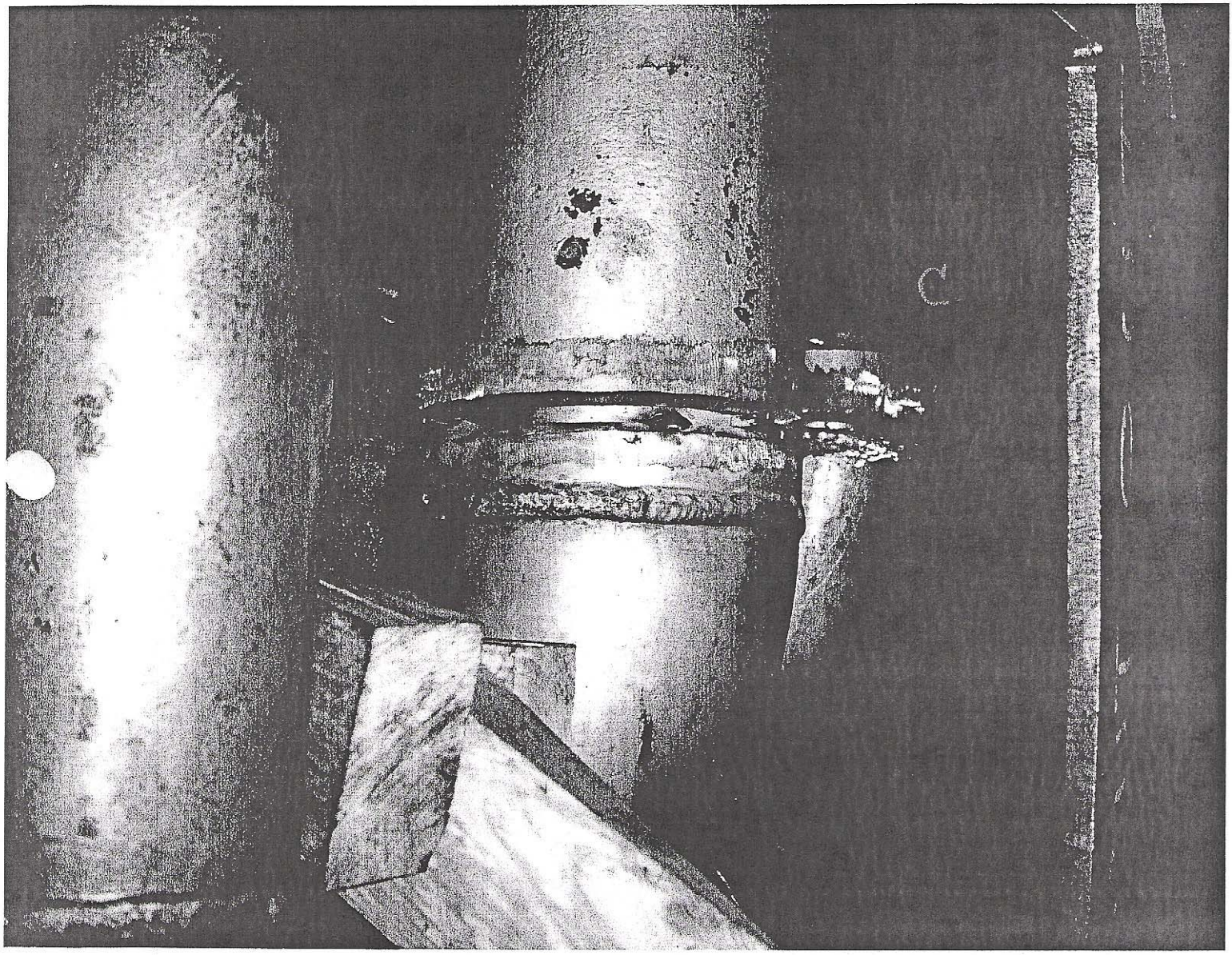
APPROVED BY: (NDE Supervisor)

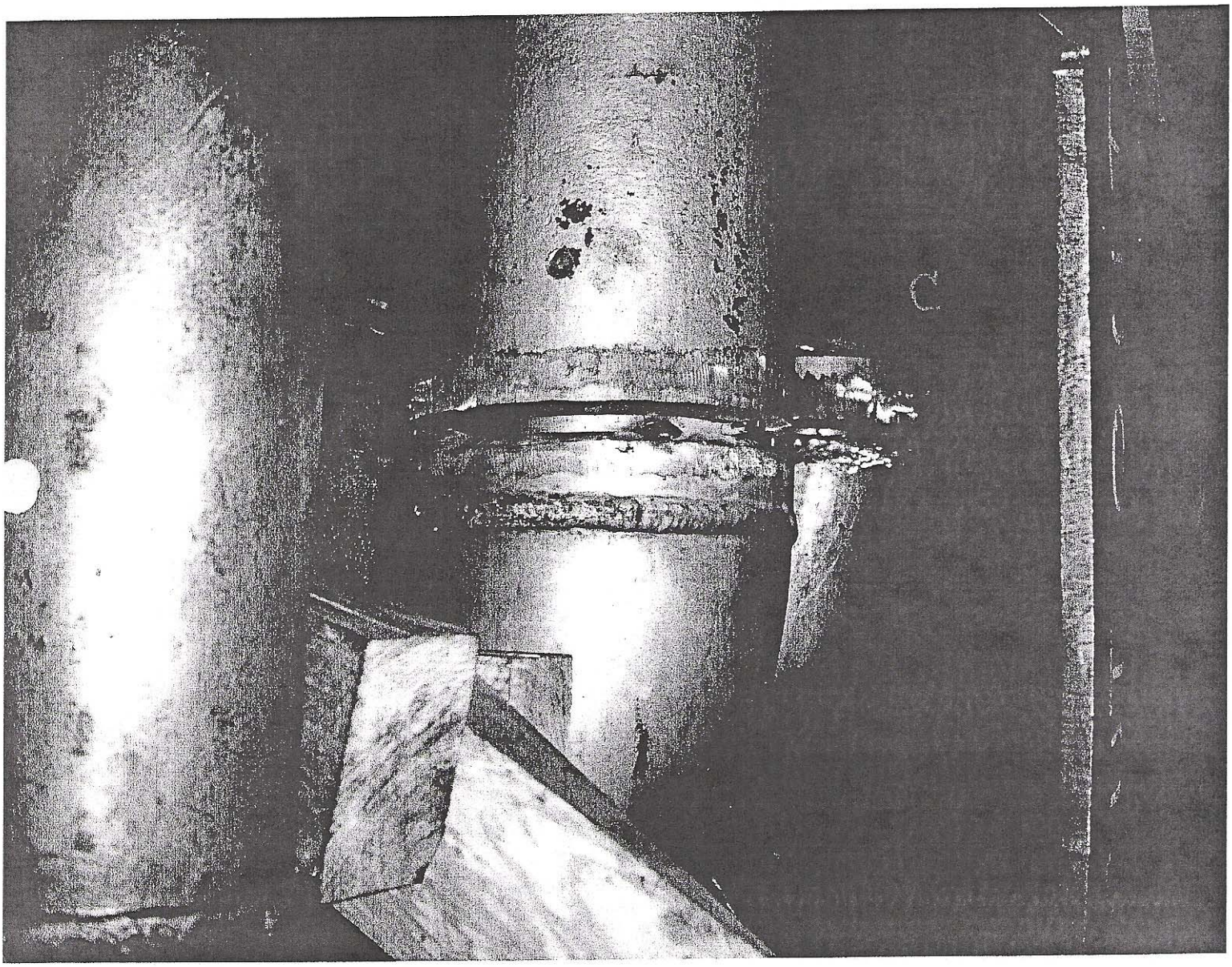
Signature _____ DATE _____

66156A0804




C





Mitchell Station Unit #1

American Electric Power Company

Ohio Power Company

A unit of American Electric Power

Steam Cycle Shutdown

Westinghouse T-G Set

800 MWs - Tandem Compound - 3600 rpm

VHP-HP Turbine	Serial Number	13A3160-1
IP Turbine	Serial Number	13A3161-1
LP Turbine #1	Serial Number	13A3162-1
LP Turbine #2	Serial Number	13A3163-1
Turbine Instruction Book		1250-C679
HP Generator	Serial Number	1-S-87P0755
HP Exciter	Serial Number	1-S-73P0476
Generator Instruction Book		90P0944
Boiler Feed Pump Drive Turbine		15-A-2961-1
BFP/DT Instruction Manual		1150-C129
July Shutdown		7-20-2006 to 7-24-2006

Table of Contents

Executive Summary

This scope is work performed during a four-day system cycle shutdown to repair boiler tube leakage. The work performed by this RSO Crew was; 1.) The open, inspect and repair of the electric generator hydrogen seal oil skid regulator tank level control, 2.) The repair of a steam leak at the first reheat stop valve bonnet, 3.) Review and possible correction of poor performance of a steam chest strainer differential gage point, and 4.) Correcting water leakage across a Stator Water Coolant Skid heat exchanger tube.

Recommendations

1. Install new circulating water isolation valves for the stator water coolant skid.

2. Replace the upper cooler reversing head of the stator water coolant skid.

3. Replace root valves for main turbine steam chest sensing lines.

4. Had Auto – Cad correct OEM Tech Manual Seal Oil Diagram to reflect the abandonment of the hydrogen cooled exciter. All in-use Tech Manuals should be updated accordingly.

Resources

Internal

Steve Dolan	KAMMER STATION	Electric Process Owner
Jack Huggins	KAMMER STATION	Electrical Process Supervisor
Ralph Pederson	GET TSV TC	Lead Turbine Coordinator
Doug Fox	GET TSV RSO	Supervisor – Turbine Crew
Jeff Brothers	GET TSV RSO	Supervisor – Turbine Crew
Robin Margolis	GET TSV CMS	Non Destructive Examination
Robert Lake	GET TSV RSO	Gavin Tool Facility

External

NONE

WO Numbers

40794550 01	Hydrogen SOS Repairs
40794556 01	LS Reheat Stop Valve Gasket – 1st
40794562 01	Strainer Tap Diff Loop & Valve
40794567 01	Stator Water Cooler Leak

Work Performed

Hydrogen Seal Oil Skid

The hydrogen seal oil skid regulating tank was opened to determine the cause for back flooding the electric generator collector end defoaming tank into the stator cavity. Operations had been manually draining lubricating seal oil from collector end liquid detector. Personnel have been removing this material on an hourly and sometimes more frequent schedule. The leakage is worse on power cycle start up and shut down.

The east end regulator tank cover was removed to inspect the tank interior and the inlet and drain float valve mechanisms. The interior of the tank was found gritty and with evidence of water in the past. The condition of the float valve mechanisms was good with no dropped linkage pins. The mechanisms were manually manipulated to determine smooth function of the mechanisms. The mechanisms were found to swing easily and with no sign of drag. The valves and their mechanisms were removed from the tank for closer inspection. The internals of the valves and mechanisms were in excellent condition. The valves and their mechanisms were restored to the regulating tank. The stem lengths of the valves were changed to correct their function interact. The drain valve stem length was shortened 0.180” while the inlet valve stem length was expanded by 0.100”. The change of stem length gives a dead band of approximately one inch from the time the inlet valve stops porting oil until the time when the drain valve begins dropping tank level. The dead band was set up to be at approximately tank horizontal centerline. The As Found float stem lengths had the drain valve open before the inlet valve was closed.

The mechanical magnetic level indicator was inspected to determine cause to failure to properly show level. The action of level indicator during inspection was good. The cause of poor indication service appeared to be the swing arc of the inlet valve float arm could strike the indicator. This was reviewed and the concern for impeded operation of the two devices was corrected by establishing a 3/16” clearance between the devices. Westinghouse Tech Manual diagram intents this removed regulating tank cover to be at the west end.

The oil connection line between the regulating tank and the receiver tank was blown with air to determine no obstruction existed. The same process was applied to the gas connection line at the top of these tanks. No obstruction was found in either line. The line from the float drain valve to the airside pump was inspected for obstruction and none found. An attempt was made to push a probe camera up the drain line from the defoaming tanks to the receiver tank. The probe could be pushed approximately 28 feet before the drag of the numerous elbows stopped progress advancement. Nothing unusually was noted in the pipe scoped.

Reheat Stop Valve

The Main Turbine left side first reheat stop valve bonnet cover was removed to install a new flexitallic gasket. The sealing faces were cleaned and stoned. No damage was found on these surfaces. A new gasket was seated and the bonnet fasteners torqued to a preload of 45,000 PSI.

Stop Valve Strainer Differential Sensing Line

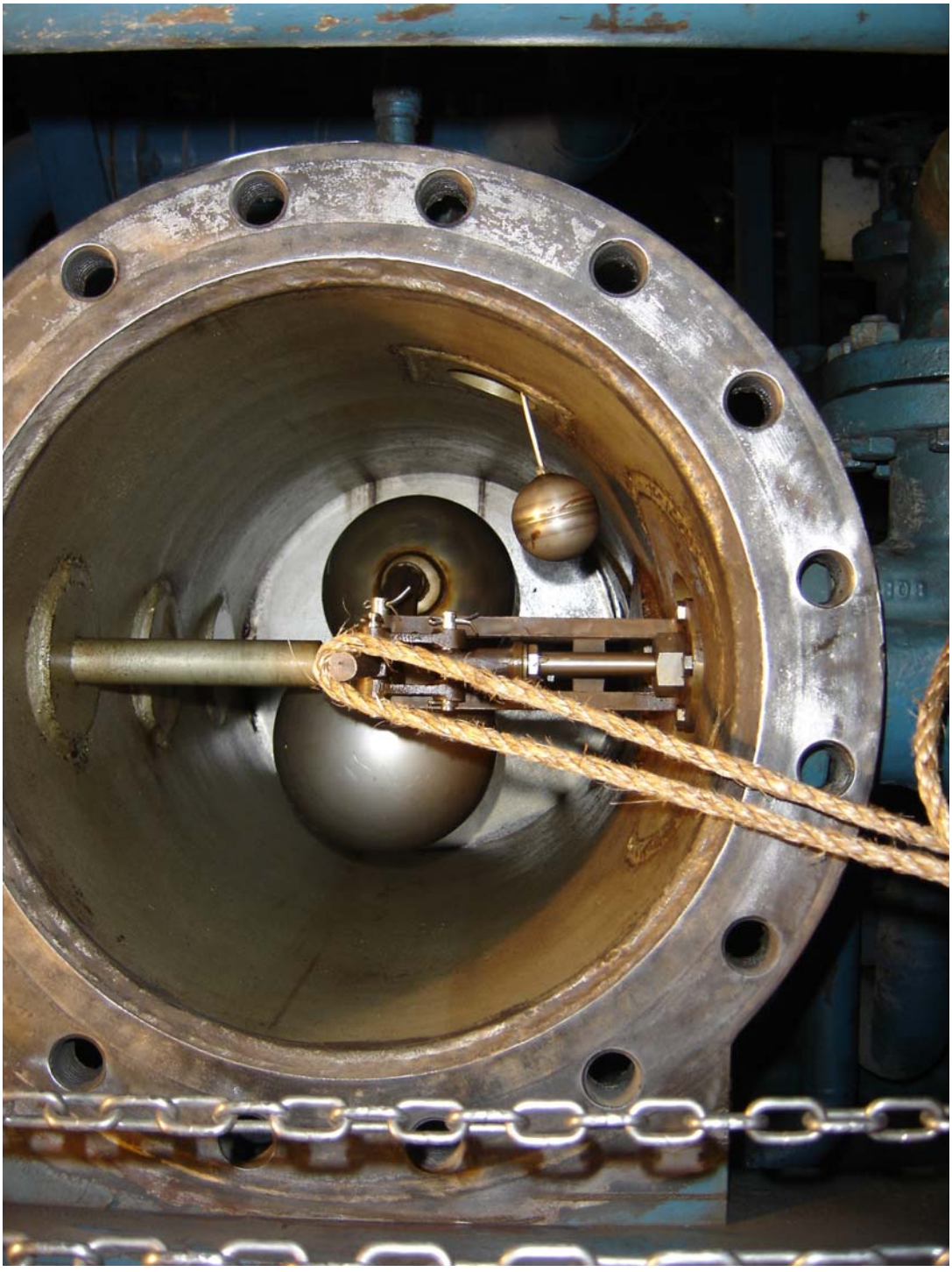
The plant was having difficulty obtaining main stop valve strainer differential pressures from the right side steam chest. RSO applied 80-PSI air pressure to this sensing line and impact shock to the steam chest root valve. The sensing line has an approximate line run of 50 feet. The line finally would past air from the wall-mounted indicator to the steam chest root valve after a number of applications.

Stator Water Cooler Leak

The plant reported the Stator Water Coolant Skid to be using approximately 30 to 40 gallons of demineralized water a shift for makeup. It was felt that there was a tube leak to the circulating water side. The skid coolers were isolated from the stator and pressure tested using circulating water. The through wall tube leak was found to be in the top cooler. The circulating water isolation valves at the cooler were found to leak through and thus the isolation was moved to the cooling tower line. The inlet-outlet and reversing heads were removed and the tube sheets soaped to determine damaged tube while the cooler shell side was pressurized with 5-PSI air. A single tube was found to be the source of leakage and brass tube plugs seated. The cooler heads were reassembled using new gaskets. An existing linear indication was found on the reversing head. The indication is water tight and has been coated with an epoxy sometime in the past. The cooler head assembly interfaces were pressurized with circulating water to review for leakage to human environment. None were observed. The reversing head was installed as is as the indication had been epoxy coated in the past and was water tight. See Photos.

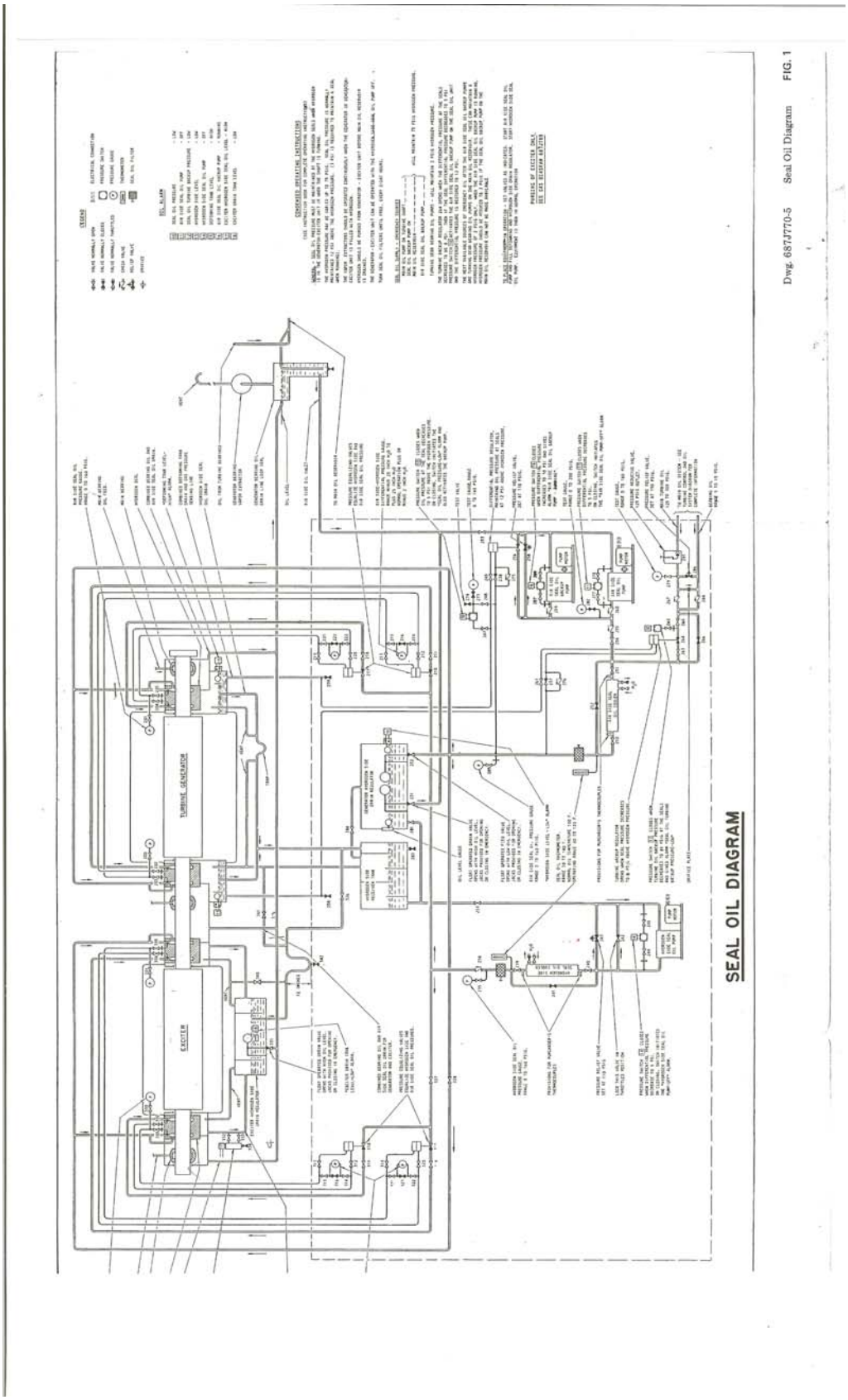
Attachment 1 - SOS Regulating Tank at Disassembly –Note fine debris and rust

Attachment 2 - SOS Regulating Tank Floats as Restored

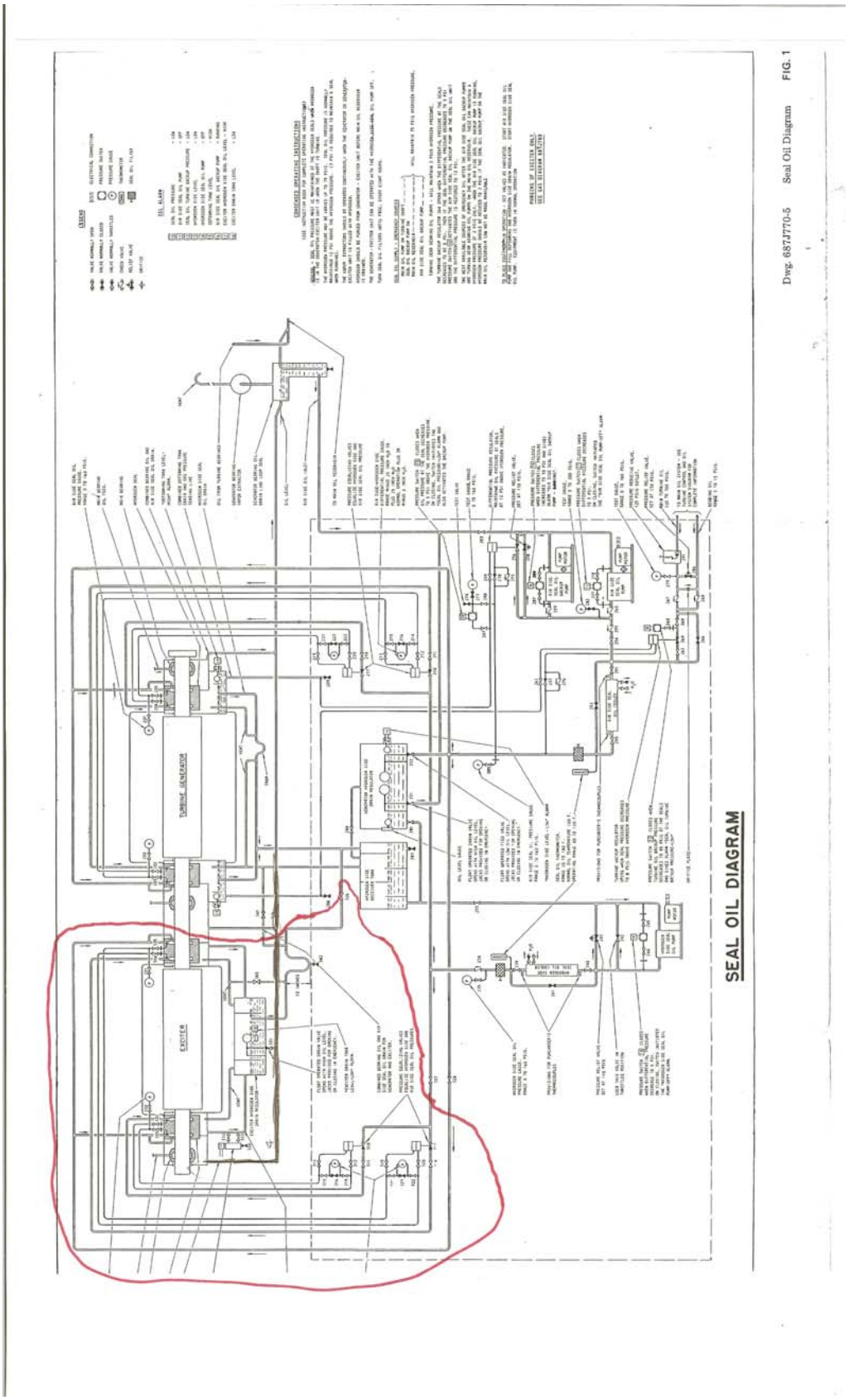


Attachment 3 - SOS Regulating Tank Level Indication Float

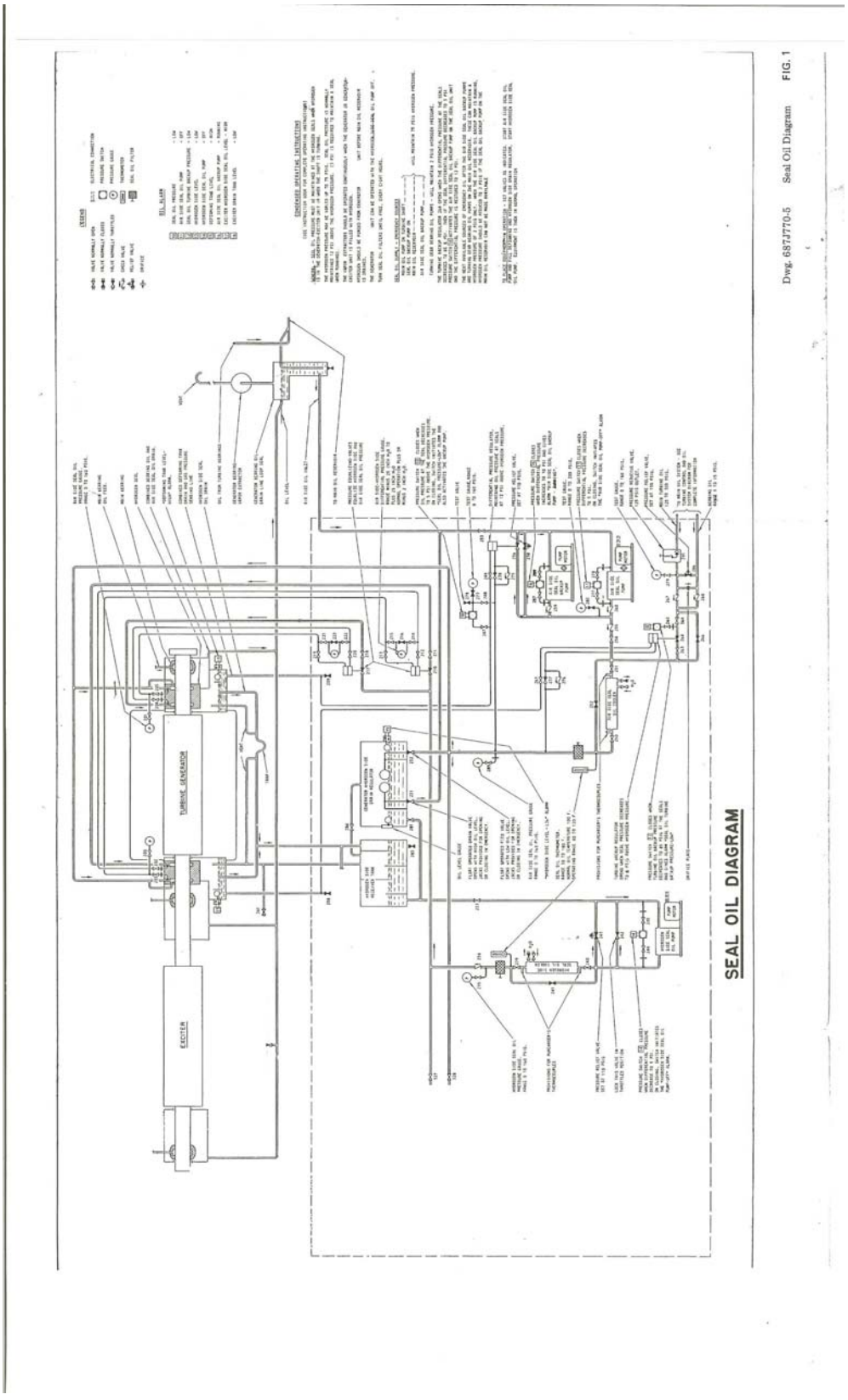
Attachment 4 - Old Tech Manual Seal Oil Diagram



Attachment 5 - Seal Oil Diagram Red Line

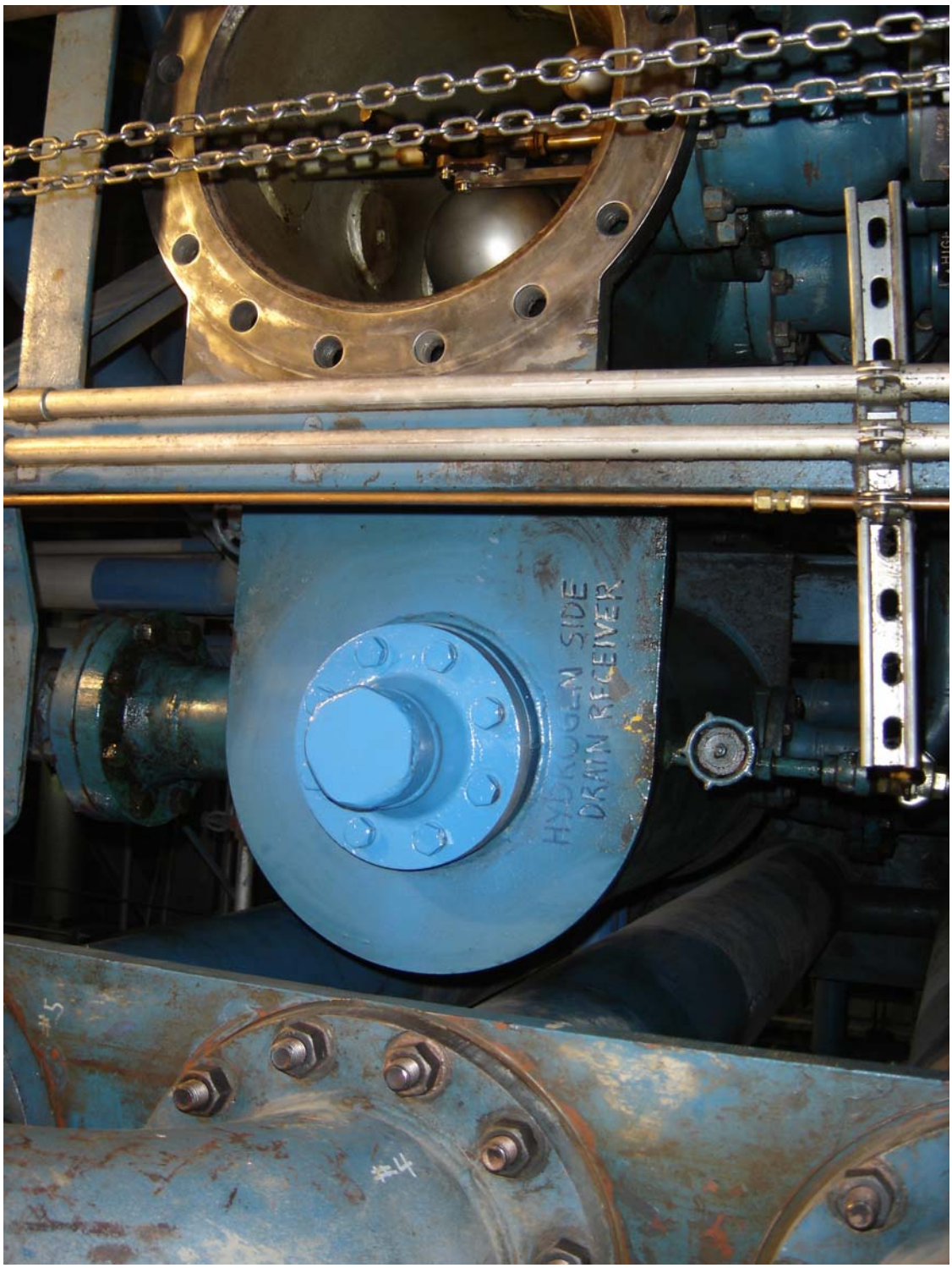


Attachment 6 - Seal Oil Diagram Cleaned Up As Built

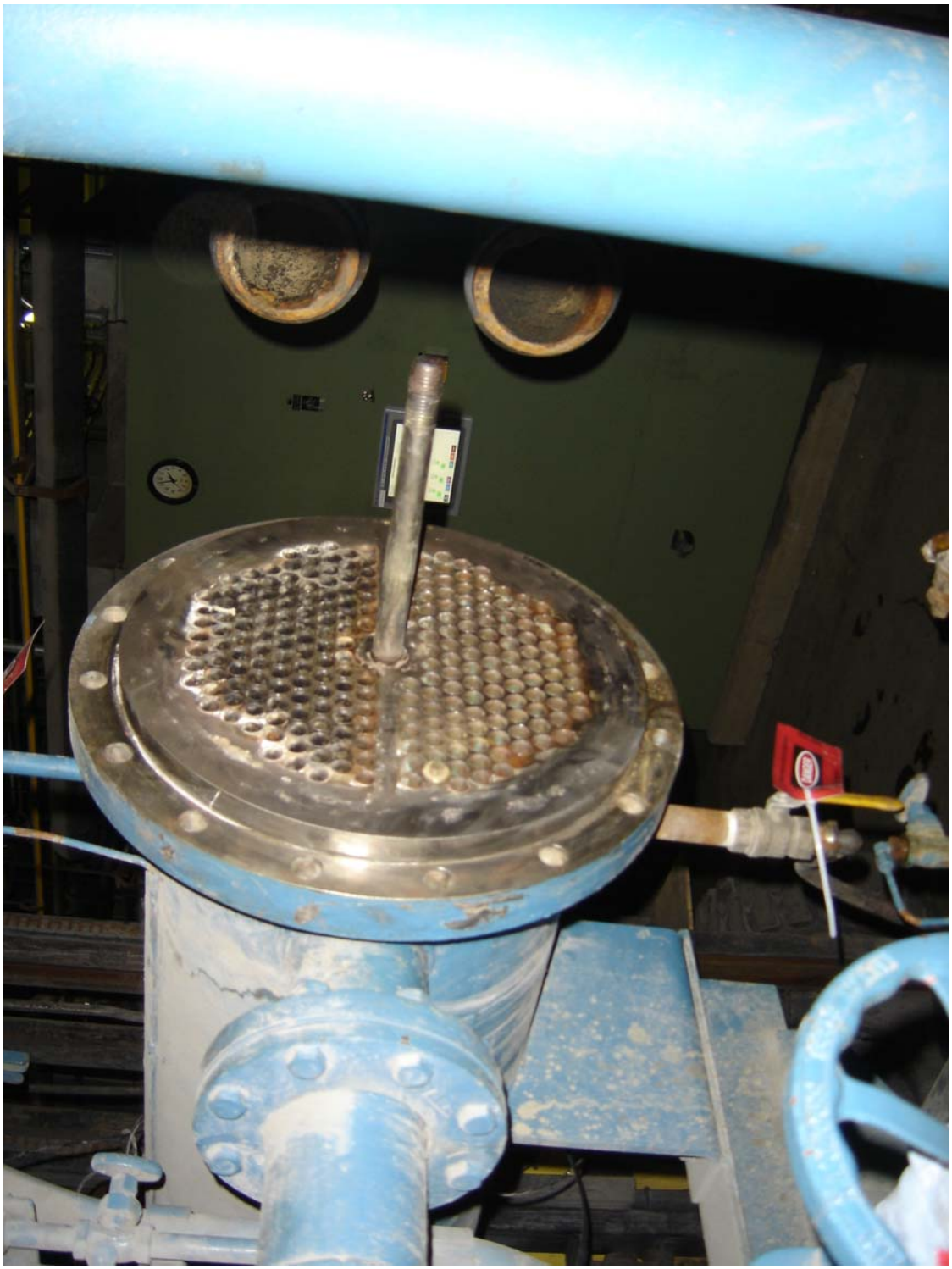


Attachment 7 - Removed Exciter H2 Drain Valve 326

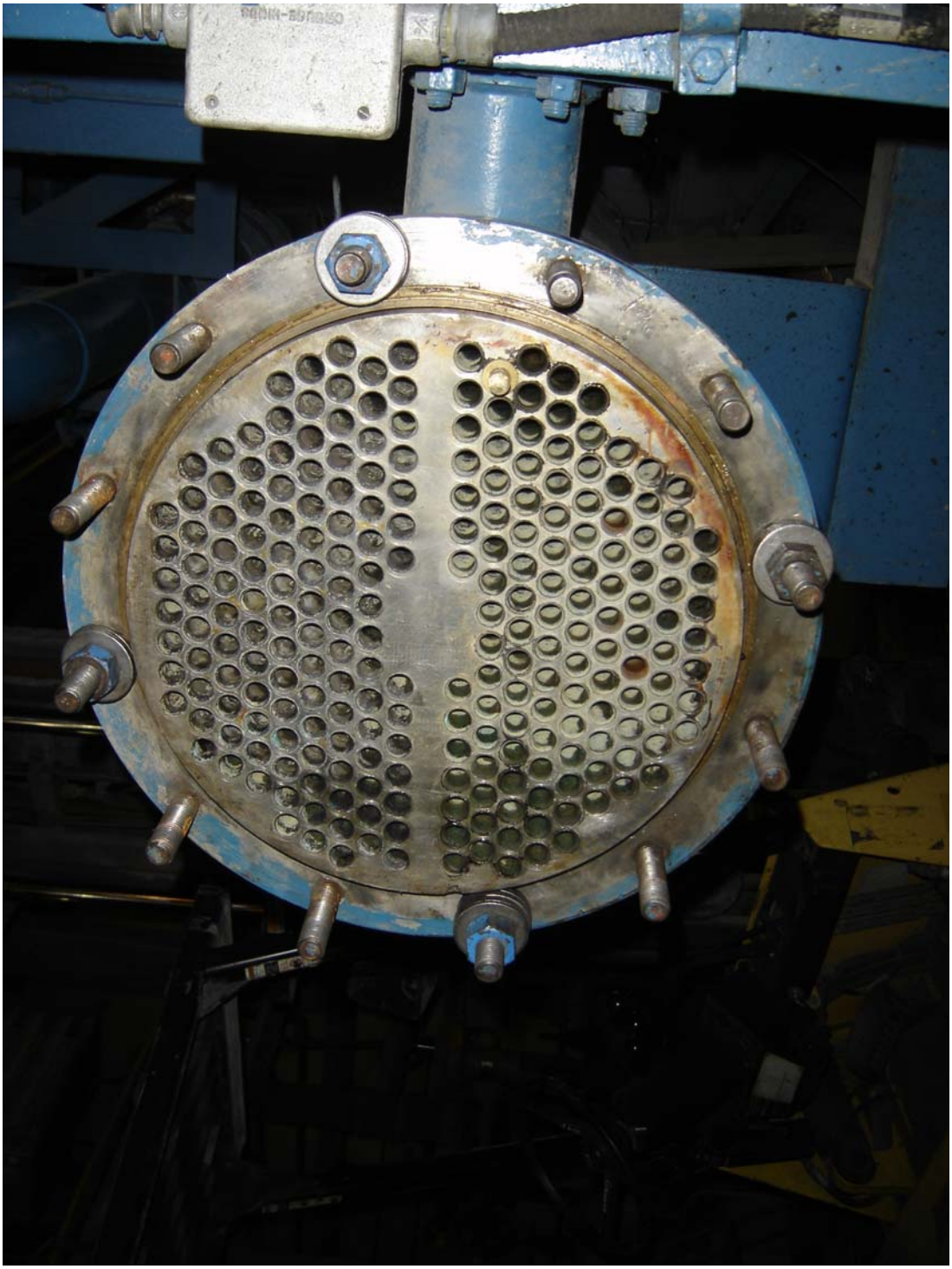
Attachment 8 - Blank Installment for Valve 326



Attachment 9 - Stator Water Inlet-Outlet End Tube Plug



Attachment 10 - Stator Water Reversing End Tube Plug

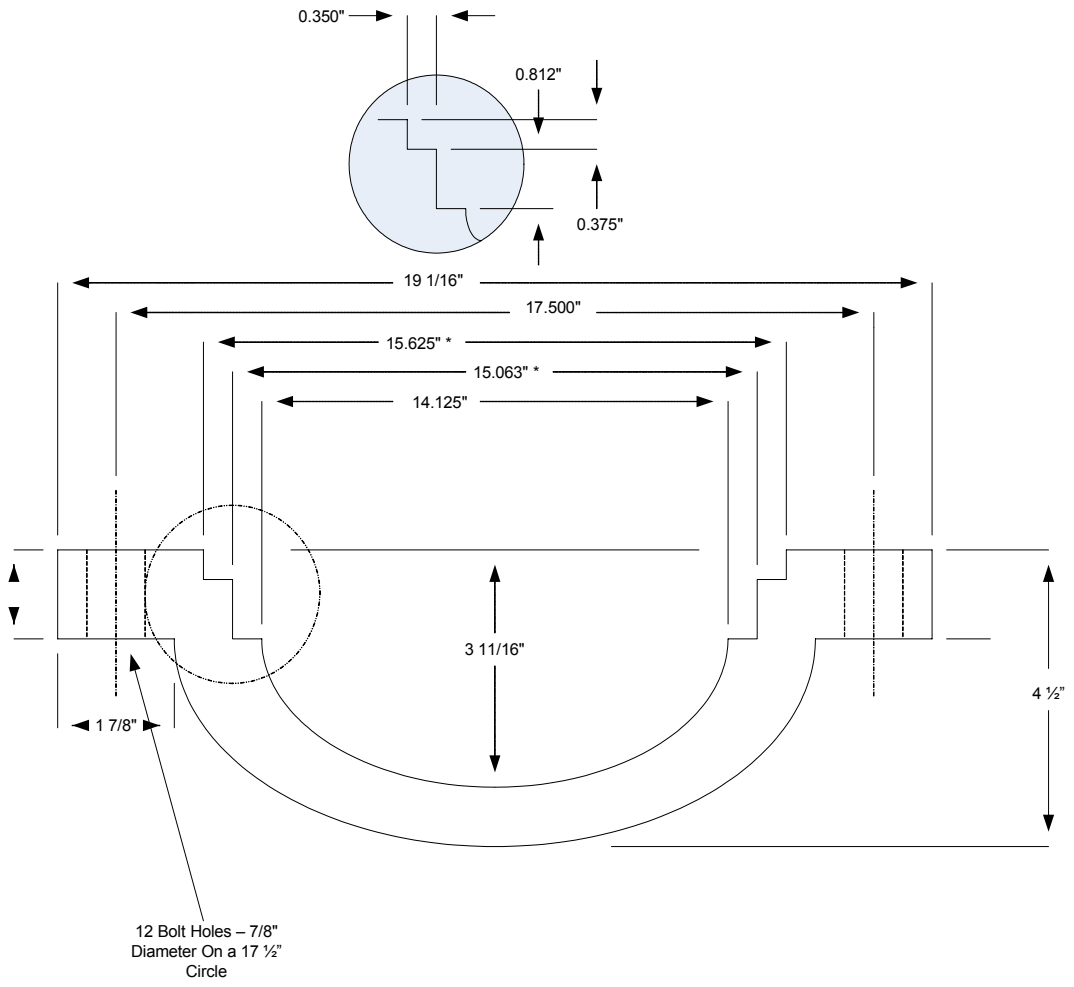


Attachment 11 - Stator Water Reversing Cover Crack

Attachment 12 - Stator Water Reversing Cover Crack

Attachment 13 - Stator Water Reversing Cover Dimensions

Mitchell Unit #1 Stator Cooling Water Upper Cooler Reversing Cover Dimensions



Site Turbine Tools **Tab 3**
(Pages 25)

Manager of Specialty Tools Documentation of Tool Form

Manager of Specialty Tools: Please note Tool ID and then sign and date the appropriate box(es). If other, please clearly specify the action using as many rows as necessary to explain. If an action is not applicable to a specific tool please mark the appropriate box "NA".

Tool ID #	Specialty Tool Identification Form Completed	Specialty Tool Critical Requirements Checklist Completed	Engineering Review Submittal	Engineering Review Complete	Received Proper Documentation from Reviewer	Certification (Approved for Use)	Permanent ID Label Application	Testing (Be Specific)	Re-certification	Other (Please Specify)
ML-U1-TV-001	X	X								
ML-U1-TV-002	X	X								
ML-U1-TV-003	X	X								
ML-U1-TV-004	X	X								
ML-U1-TV-005										
ML-U1 GV-001	X	X								
ML-U1 GV-002	X	X								

Specialty Tool Identification Form

General Information		
Tool Name: Throttle Plug Lock	Tool Originator:	Tool ID #: ML-U1-TV-001
Date of ID Issue:	Manager Name:	Tool Location: Mitchell Station Unit #1
Tool Function and Description: Secure Unit # 1 throttle plug for disassembly of internal steam pilot valve		

Re-certification		
Is re-certification required?	Y	(N)
If yes, please give a specific amount of time or usage.		
Other stipulations?		

Verification of ID Usage		
Location on Tool:	Manager Initials:	Date:
Specific Label:		

Specialty Tool Critical Requirements Checklist

Tool ID #:	Completed By:	Date Completed:
ML-U1-TV-001	Ralph Pederson	4/6/06
Tool Name: Throttle plug Lock	**Manager Name:**	**Date Reviewed:**
Brief Description of Tool: Secure Unit#1 throttle plug for disassembly of internal steam pilot valve.		

	Unfit For Use Criteria	*Yes*	*No*
1	For an existing tool, are there any visual material deformations such as: cracks, crazing, nicks, excessive rust, significant wear, mushrooming, etc.		X
Is this tool *unfit* for use? (Any checkmarks under the *Yes* column establish this tool as *Unfit for Use* and this tool shall no longer be used. A tool determined unfit for use shall be properly labeled and a new tool shall fabricated in accordance with this document.)		Unfit for Use	Fit for Use X

	Testing Criteria	*Yes*	*No*
1	Is this tool used for lifting, as a lifting accessory, or for specialized rigging?		X
Must this tool complete required testing? (Any checkmarks under the *Yes* column require this tool complete required testing before further use. A tool required to complete testing must be properly labeled until approved for use by Specialty Tool Manager. A list of reference regulations for required testing may be found in the attachment titled Specialty Equipment Industry and Safety Requirements. Tools in this category are now regulated by the requirements of the applicable document.)		Testing Required	No Testing Required X

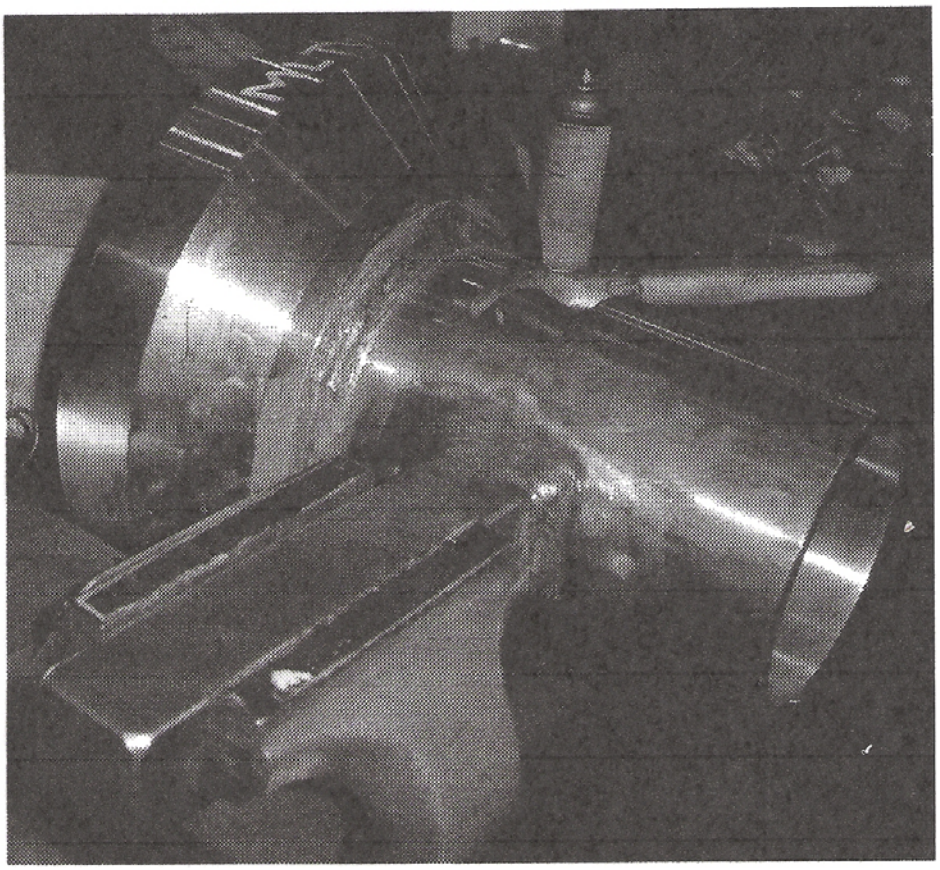
** Checklist Continued on Next Page**

Specialty Tool Critical Requirements Checklist

	Critical Criteria	*Yes*	*No*
1	Does this tool operate under machine power?		X
2	Does this tool contain significant stored energy (springs, trigger mechanism, etc)?		X
3	If the tool were to fail, would its failure result in operator injury?		X
4	Does this tool operate in extreme environments (temperature, pressure, potentially corrosive, etc.)?		X
5	Does this tool operate in a repetitive manner at high levels of force (conditions indicative of fatigue)?		X
6	Regardless of checklist results, does good judgment necessitate an engineering review of this tool?		X
Does this tool require Engineering Review? (Any checkmarks under the *Yes* column require the tool to go through an engineering review. A tool required to complete an engineering review must be properly labeled until approved for use by Specialty Tool Manager.)		Critical	Non-critical X

Signature of Tool Originator	Ralph Pederson	Date	4/6/06
Signature of Specialty Tool Manager		Date	

ML-U1-TV-001 - Throttle Plug Lock



Specialty Tool Identification Form

General Information		
Tool Name: Throttle Plug Spanner	Tool Originator:	Tool ID #: ML-41-TV-002
Date of ID Issue:	Manager Name:	Tool Location: Mitchell Station Unit #1
Tool Function and Description: Spanner wrench to turn throttle plug internal pilot valve bashing nut		

Re-certification		
Is re-certification required?	Y	(N)
If yes, please give a specific amount of time or usage.		
Other stipulations?		

Verification of ID Usage		
Location on Tool:	Manager Initials:	Date:
Specific Label:		

Specialty Tool Critical Requirements Checklist

Tool ID #:	Completed By:	Date Completed:
ML-UL-TV-002	Ralph Pederson	1/6/06
Tool Name:	**Manager Name:**	**Date Reviewed:**
throttle plug Spanner		
Brief Description of Tool: Spanner wrench to turn throttle plug internal pilot valve bushing nut		

	Unfit For Use Criteria	*Yes*	*No*
1	For an existing tool, are there any visual material deformations such as: cracks, crazing, nicks, excessive rust, significant wear, mushrooming, etc.		X
Is this tool *unfit* for use? (Any checkmarks under the *Yes* column establish this tool as *Unfit for Use* and this tool shall no longer be used. A tool determined unfit for use shall be properly labeled and a new tool shall fabricated in accordance with this document.)		Unfit for Use	Fit for Use X

	Testing Criteria	*Yes*	*No*
1	Is this tool used for lifting, as a lifting accessory, or for specialized rigging?		X
Must this tool complete required testing? (Any checkmarks under the *Yes* column require this tool complete required testing before further use. A tool required to complete testing must be properly labeled until approved for use by Specialty Tool Manager. A list of reference regulations for required testing may be found in the attachment titled Specialty Equipment Industry and Safety Requirements. Tools in this category are now regulated by the requirements of the applicable document.)		Testing Required	No Testing Required X

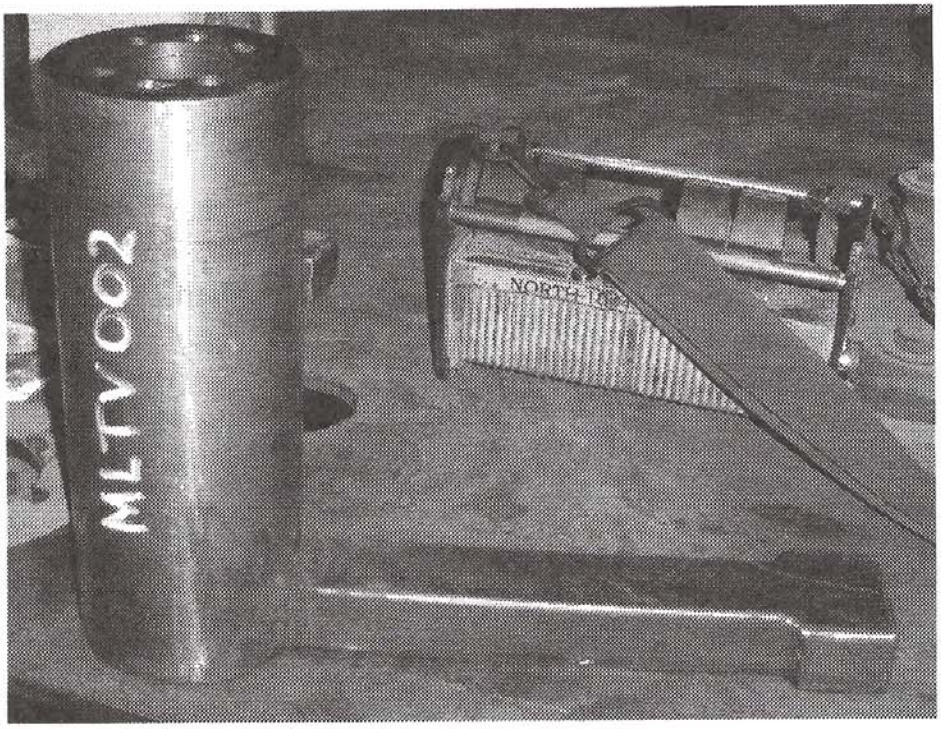
** Checklist Continued on Next Page**

Specialty Tool Critical Requirements Checklist

	Critical Criteria	*Yes*	*No*
1	Does this tool operate under machine power?		
2	Does this tool contain significant stored energy (springs, trigger mechanism, etc)?		X
3	If the tool were to fail, would its failure result in operator injury?		X
4	Does this tool operate in extreme environments (temperature, pressure, potentially corrosive, etc.)?		X
5	Does this tool operate in a repetitive manner at high levels of force (conditions indicative of fatigue)?		X
6	Regardless of checklist results, does good judgment necessitate an engineering review of this tool?		X
Does this tool require Engineering Review? (Any checkmarks under the *Yes* column require the tool to go through an engineering review. A tool required to complete an engineering review must be properly labeled until approved for use by Specialty Tool Manager.)		Critical	Non-critical X

Signature of Tool Originator	Ralph Pederson	Date	4/6/06
Signature of Specialty Tool Manager		Date	

ML-U1-TV-002 – Throttle Plug Spanner



Specialty Tool Identification Form

General Information		
Tool Name: Throttle Pilot Spanner	Tool Originator:	Tool ID #: ML-U1-TV-003
Date of ID Issue:	Manager Name:	Tool Location: Mitchell Station Unit #1
Tool Function and Description: Throttle Valve pilot nut spanner wrench		

Re-certification		
Is re-certification required?	Y	(N)
If yes, please give a specific amount of time or usage.		
Other stipulations?		

Verification of ID Usage		
Location on Tool:	Manager Initials:	Date:
Specific Label:		

Specialty Tool Critical Requirements Checklist

Tool ID #:	Completed By:	Date Completed:
ML-HI-TV-003	Ralph Pederson	4/6/06
Tool Name: Throttle Pilot Spanner	**Manager Name:**	**Date Reviewed:**
Brief Description of Tool:		

	Unfit For Use Criteria	*Yes*	*No*
1	For an existing tool, are there any visual material deformations such as: cracks, crazing, nicks, excessive rust, significant wear, mushrooming, etc.		X
Is this tool *unfit* for use? (Any checkmarks under the *Yes* column establish this tool as *Unfit for Use* and this tool shall no longer be used. A tool determined unfit for use shall be properly labeled and a new tool shall fabricated in accordance with this document.)		Unfit for Use	Fit for Use X

	Testing Criteria	*Yes*	*No*
1	Is this tool used for lifting, as a lifting accessory, or for specialized rigging?		X
Must this tool complete required testing? (Any checkmarks under the *Yes* column require this tool complete required testing before further use. A tool required to complete testing must be properly labeled until approved for use by Specialty Tool Manager. A list of reference regulations for required testing may be found in the attachment titled Specialty Equipment Industry and Safety Requirements. Tools in this category are now regulated by the requirements of the applicable document.)		Testing Required	No Testing Required X

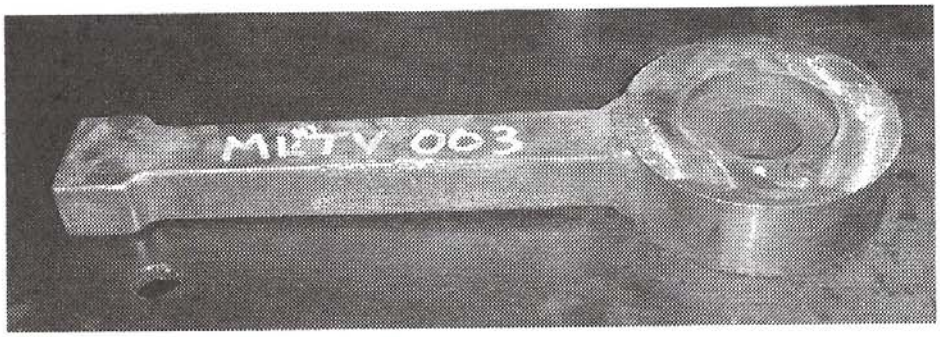
** Checklist Continued on Next Page**

Specialty Tool Critical Requirements Checklist

	Critical Criteria	*Yes*	*No*
1	Does this tool operate under machine power?		X
2	Does this tool contain significant stored energy (springs, trigger mechanism, etc)?		X
3	If the tool were to fail, would its failure result in operator injury?		X
4	Does this tool operate in extreme environments (temperature, pressure, potentially corrosive, etc.)?		X
5	Does this tool operate in a repetitive manner at high levels of force (conditions indicative of fatigue)?		X
6	Regardless of checklist results, does good judgment necessitate an engineering review of this tool?		X
Does this tool require Engineering Review? (Any checkmarks under the *Yes* column require the tool to go through an engineering review. A tool required to complete an engineering review must be properly labeled until approved for use by Specialty Tool Manager.)		Critical	Non-critical X

Signature of Tool Originator	Ralph Podera	Date	4/6/06
Signature of Specialty Tool Manager		Date	

ML-U1-TV-003 – Throttle Pilot Spanner



Specialty Tool Critical Requirements Checklist

Tool ID #:	Completed By:	Date Completed:
ML-MI-TV-004	Ralph Pederson	4-12-2006
Tool Name: TV Secondary Plug Lock	**Manager Name:**	**Date Reviewed:**
Brief Description of Tool: Clamp to hold throttling valve secondary plug stationary while loosening guide bushing nut		

	Unfit For Use Criteria	*Yes*	*No*
1	For an existing tool, are there any visual material deformations such as: cracks, crazing, nicks, excessive rust, significant wear, mushrooming, etc.		X
Is this tool *unfit* for use? (Any checkmarks under the *Yes* column establish this tool as *Unfit for Use* and this tool shall no longer be used. A tool determined unfit for use shall be properly labeled and a new tool shall fabricated in accordance with this document.)		Unfit for Use	Fit for Use X

	Testing Criteria	*Yes*	*No*
1	Is this tool used for lifting, as a lifting accessory, or for specialized rigging?		X
Must this tool complete required testing? (Any checkmarks under the *Yes* column require this tool complete required testing before further use. A tool required to complete testing must be properly labeled until approved for use by Specialty Tool Manager. A list of reference regulations for required testing may be found in the attachment titled Specialty Equipment Industry and Safety Requirements. Tools in this category are now regulated by the requirements of the applicable document.)		Testing Required	No Testing Required X

** Checklist Continued on Next Page**

Specialty Tool Identification Form

General Information		
Tool Name: TV Secondary Plug Lock	Tool Originator:	Tool ID #: ML-U1-TV-004
Date of ID Issue: 4-12-2006	Manager Name:	Tool Location:
Tool Function and Description: Clamp to hold throttle valve secondary plug stationary while loosening guide bushing nut		

Re-certification		
Is re-certification required?	Y	(N)
If yes, please give a specific amount of time or usage.		
Other stipulations?		

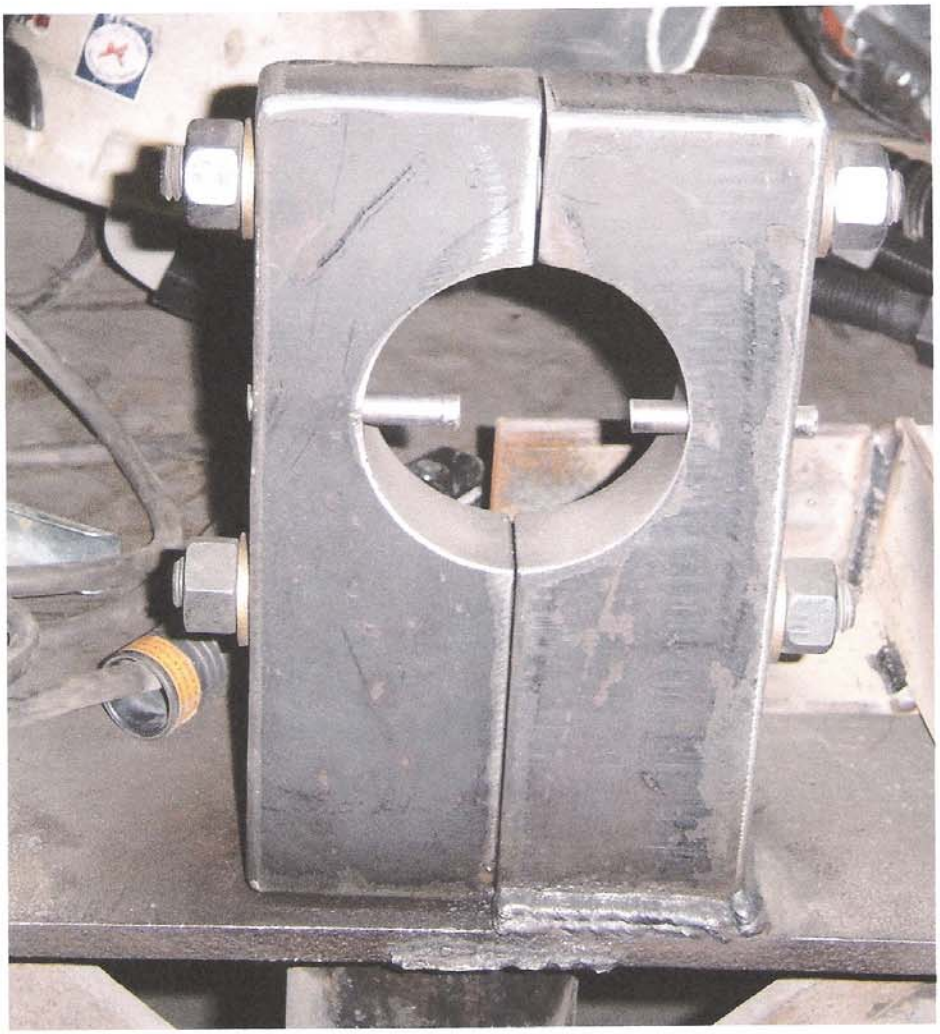
Verification of ID Usage		
Location on Tool:	Manager Initials:	Date:
Specific Label:		

Specialty Tool Critical Requirements Checklist

	Critical Criteria	*Yes*	*No*
1	Does this tool operate under machine power?		X
2	Does this tool contain significant stored energy (springs, trigger mechanism, etc)?		X
3	If the tool were to fail, would its failure result in operator injury?		X
4	Does this tool operate in extreme environments (temperature, pressure, potentially corrosive, etc.)?		X
5	Does this tool operate in a repetitive manner at high levels of force (conditions indicative of fatigue)?		X
6	Regardless of checklist results, does good judgment necessitate an engineering review of this tool?		X
Does this tool require Engineering Review? (Any checkmarks under the *Yes* column require the tool to go through an engineering review. A tool required to complete an engineering review must be properly labeled until approved for use by Specialty Tool Manager.)		Critical	Non-critical X

Signature of Tool Originator	Ralph Pederson	Date	4-12-2006
Signature of Specialty Tool Manager		Date	

ML-U1-TV-004 – TV Secondary Plug Lock



Specialty Tool Identification Form

General Information		
Tool Name: GV Plug Lock	Tool Originator:	Tool ID #: ML-U1-GV-001
Date of ID Issue: 4-17-2006	Manager Name:	Tool Location: Mitchell Station
Tool Function and Description: Clamp to hold givernor valve plug while loosening valve bushing guide nut		

Re-certification		
Is re-certification required?	Y	(N)
If yes, please give a specific amount of time or usage.		
Other stipulations?		

Verification of ID Usage		
Location on Tool:	Manager Initials:	Date:
Specific Label:		

Specialty Tool Critical Requirements Checklist

Tool ID #:	Completed By:	Date Completed:
ML-U1-GV-001	Ralph Pederson	4-17-2006
Tool Name:	**Manager Name:**	**Date Reviewed:**
Brief Description of Tool: Clamp to hold governor valve plug while loosening valve guide bushing nut		

	Unfit For Use Criteria	*Yes*	*No*
1	For an existing tool, are there any visual material deformations such as: cracks, crazing, nicks, excessive rust, significant wear, mushrooming, etc.		X
Is this tool *unfit* for use? (Any checkmarks under the *Yes* column establish this tool as *Unfit for Use* and this tool shall no longer be used. A tool determined unfit for use shall be properly labeled and a new tool shall fabricated in accordance with this document.)		Unfit for Use	Fit for Use X

	Testing Criteria	*Yes*	*No*
1	Is this tool used for lifting, as a lifting accessory, or for specialized rigging?		X
Must this tool complete required testing? (Any checkmarks under the *Yes* column require this tool complete required testing before further use. A tool required to complete testing must be properly labeled until approved for use by Specialty Tool Manager. A list of reference regulations for required testing may be found in the attachment titled Specialty Equipment Industry and Safety Requirements. Tools in this category are now regulated by the requirements of the applicable document.)		Testing Required	No Testing Required X

** Checklist Continued on Next Page**

Specialty Tool Critical Requirements Checklist

	Critical Criteria	*Yes*	*No*
1	Does this tool operate under machine power?		X
2	Does this tool contain significant stored energy (springs, trigger mechanism, etc)?		X
3	If the tool were to fail, would its failure result in operator injury?		X
4	Does this tool operate in extreme environments (temperature, pressure, potentially corrosive, etc.)?		X
5	Does this tool operate in a repetitive manner at high levels of force (conditions indicative of fatigue)?		X
6	Regardless of checklist results, does good judgment necessitate an engineering review of this tool?		X
Does this tool require Engineering Review? (Any checkmarks under the *Yes* column require the tool to go through an engineering review. A tool required to complete an engineering review must be properly labeled until approved for use by Specialty Tool Manager.)		Critical	Non-critical X

Signature of Tool Originator	Ralph Pedersen	Date	4-17-2006
Signature of Specialty Tool Manager		Date	

ML-U1-GV-001 – GV Plug Lock

Specialty Tool Critical Requirements Checklist

Tool ID #:	Completed By:	Date Completed:
ML-41-GV-002	Ralph Pederson	4-17-2006
Tool Name: GV Plug Spanner	**Manager Name:**	**Date Reviewed:**
Brief Description of Tool: Spanner wrench to work on GV bushing guidenut while ML-41-GV-001 holds GV plug		

	Unfit For Use Criteria	*Yes*	*No*
1	For an existing tool, are there any visual material deformations such as: cracks, crazing, nicks, excessive rust, significant wear, mushrooming, etc.		X
Is this tool *unfit* for use? (Any checkmarks under the *Yes* column establish this tool as *Unfit for Use* and this tool shall no longer be used. A tool determined unfit for use shall be properly labeled and a new tool shall fabricated in accordance with this document.)		Unfit for Use	Fit for Use X

	Testing Criteria	*Yes*	*No*
1	Is this tool used for lifting, as a lifting accessory, or for specialized rigging?		Y
Must this tool complete required testing? (Any checkmarks under the *Yes* column require this tool complete required testing before further use. A tool required to complete testing must be properly labeled until approved for use by Specialty Tool Manager. A list of reference regulations for required testing may be found in the attachment titled Specialty Equipment Industry and Safety Requirements. Tools in this category are now regulated by the requirements of the applicable document.)		Testing Required	No Testing Required X

** Checklist Continued on Next Page**

Specialty Tool Identification Form

General Information		
Tool Name: GV Plug Spanner	Tool Originator:	Tool ID #: ML-U1-GV-002
Date of ID Issue: 4-17-2006	Manager Name:	Tool Location: Mitchell Station
Tool Function and Description: Spanner wrench to work on GV bushing guide nut while ML-U1-GV-001 holds GV plug		

Re-certification		
Is re-certification required?	Y	(N)
If yes, please give a specific amount of time or usage.		
Other stipulations?		

Verification of ID Usage		
Location on Tool:	Manager Initials:	Date:
Specific Label:		

Specialty Tool Critical Requirements Checklist

	Critical Criteria	*Yes*	*No*
1	Does this tool operate under machine power?		X
2	Does this tool contain significant stored energy (springs, trigger mechanism, etc)?		X
3	If the tool were to fail, would its failure result in operator injury?		X
4	Does this tool operate in extreme environments (temperature, pressure, potentially corrosive, etc.)?		X
5	Does this tool operate in a repetitive manner at high levels of force (conditions indicative of fatigue)?		X
6	Regardless of checklist results, does good judgment necessitate an engineering review of this tool?		X
Does this tool require Engineering Review? (Any checkmarks under the *Yes* column require the tool to go through an engineering review. A tool required to complete an engineering review must be properly labeled until approved for use by Specialty Tool Manager.)		Critical	Non-critical X

Signature of Tool Originator	Ralph Pedersen	Date	4-17-2006
Signature of Specialty Tool Manager		Date	

ML-U1-GV-002 – GV Plug Spanner

Recommendations **Tab 4**

1. The collector shaft fan needs to be balanced to eliminate the plant's operating process of running a 30-degree Frahanhiet differential of the air side and hydrogen side seal oil temperatures. It appears that the temperature differential is twisting the seal ring itself into a bound condition. This condition is pushing oil along the shaft past the seal gland casing labyrinth seals and into the hydrogen gas cavity. The plant operations currently drain approximately four ounces from the collector end liquid detector.
2. The generator collector end liquid detector alarm is not working. This device should be repaired or replaced.
3. The Seal Oil Skid turbine end and exciter end equalizing valves appear sluggish and binding. These should be shipped to Ruggles-Klingmann for a full overhaul and bench test.
4. The governor valve stand snout bushings are distressing from past tack welds. The next inspection should replace all eight of these bushings.

Data Attachments **Tab 5**

American Electric Power
Mitchell Plant Unit #1
5/21/2006
MLU106
TD 39415

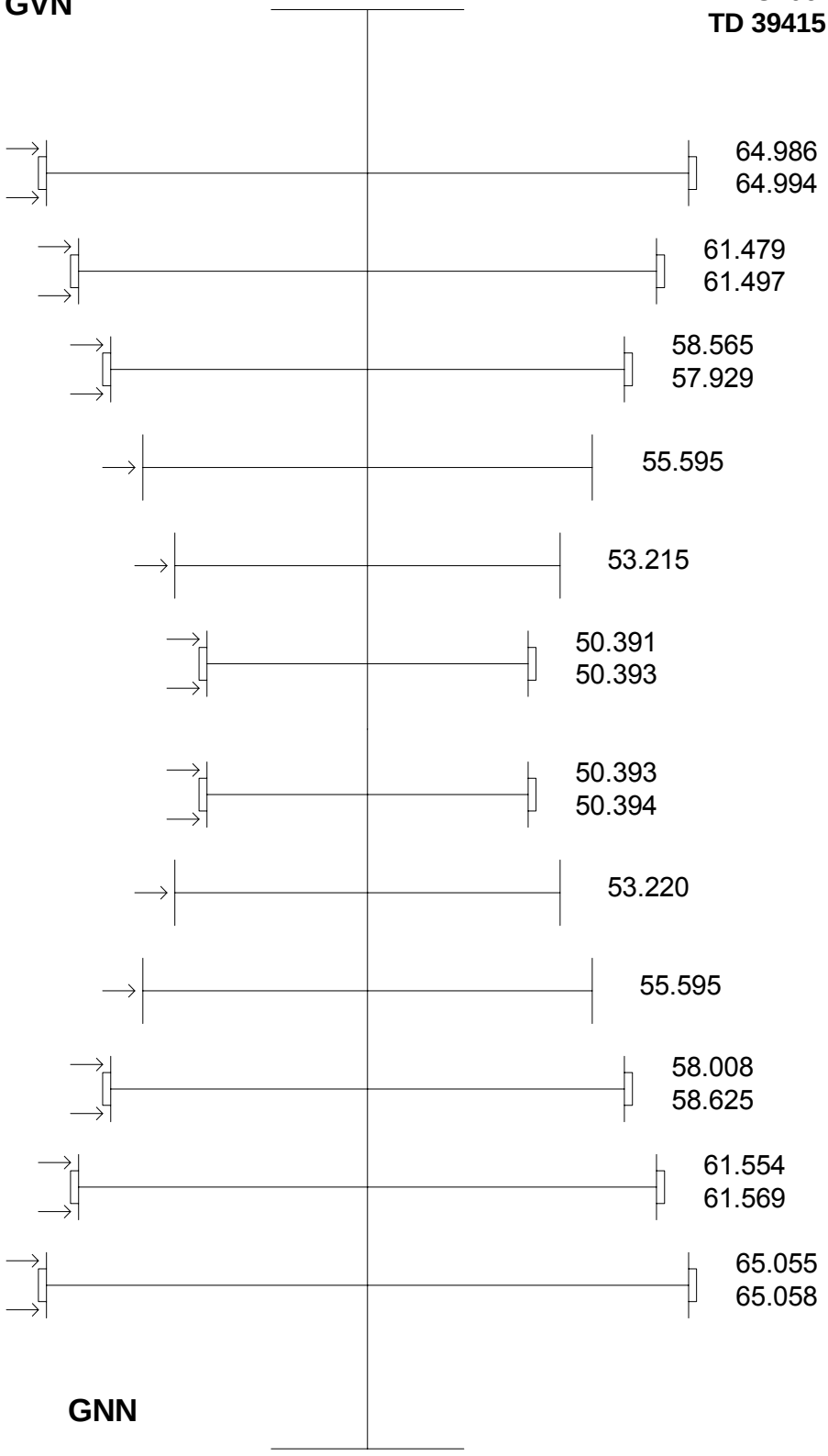
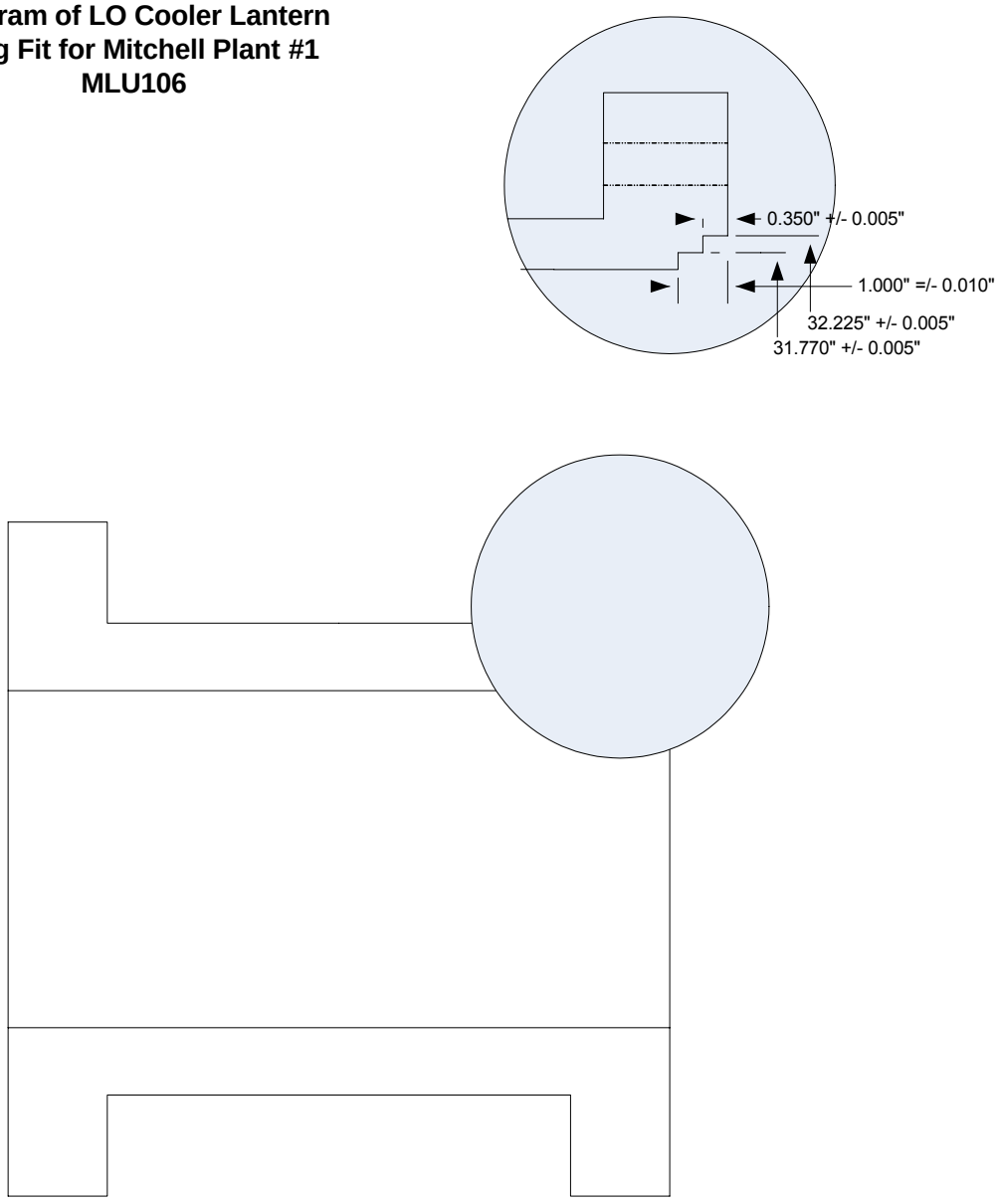
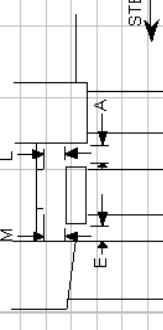


Diagram of LO Cooler Lantern Ring Fit for Mitchell Plant #1 MLU106



Rotor was set on "K" = 0.880
Design "K" = 0.880



See drawing 722J306 for sketch

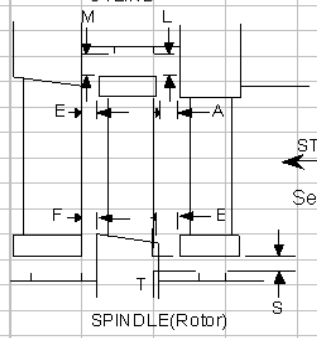
MRTT = 0.040
MRTT is Move Rotor To Thrust
******** Closer to Design or Better

GNN

	Left Side									Right Side							
Row	A	B	L	M	S	T	E	F		A	B	L	M	S	T	E	F
1	0.942	0.647					0.776	0.676		0.947	0.639					0.811	0.657
Design	0.810	0.500					0.810	0.500	Design	0.810	0.500					0.810	0.500
MRTT	0.902	0.607	********			********	0.816	0.716	MRTT	0.907	0.599	********			********	0.851	0.697
2	1.159	0.365					1.117	0.397		1.144	0.383					1.131	0.421
Design	1.130	0.380					1.130	0.380	Design	1.130	0.380					1.130	0.380
MRTT	1.119	0.325				********	1.157	0.437	MRTT	1.104	0.343				********	1.171	0.461
3	1.154	0.346								1.133	0.333						
Design	1.130	0.380					XXXXXX	XXXXXX	Design	1.130	0.380					XXXXXX	XXXXXX
MRTT	1.114	0.306							MRTT	1.093	0.293						
4	0.785	0.350					0.740	0.415		0.760	0.341					0.735	0.414
Design	0.720	0.340					0.780	0.410	Design	0.720	0.340					0.780	0.410
MRTT	0.745	0.310	********			********	0.780	0.455	MRTT	0.720	0.301	********			********	0.775	0.454
5	0.764	0.321					1.263	0.930		0.744	0.316					1.279	0.925
Design	0.720	0.340					1.280	0.910	Design	0.720	0.340					1.280	0.910
MRTT	0.724	0.281	********			********	1.303	0.970	MRTT	0.704	0.276				********	1.319	0.965
6	1.013	0.340					0.437			1.109	0.343					0.445	
Design	0.970	0.340					0.410	XXXXXX	Design	0.970	0.340					0.410	XXXXXX
MRTT	0.973	0.300	********			********	0.477		MRTT	1.069	0.303	********			********	0.485	

GNN

Rotor was set on "K" = _____
Design "K" = __0.880___



See drawing 722J306 for sketch

GVN

MRTT = 0.040
MRTT is Move Rotor To Thrust
******** Closer to Design or Better

	Left Side									Right Side							
Row	A	B	L	M	S	T	E	F		A	B	L	M	S	T	E	F
1	0.761	0.608					0.937	0.620		0.880	0.571					0.787	0.610
Design	0.880	0.560					0.750	0.440	Design	0.880	0.560					0.750	0.440
MRTT	0.801	0.648	********			********	0.897	0.580	MRTT	0.920	0.611	********			********	0.747	0.570
2	1.167	0.394					1.070	0.391		1.167	0.384					1.070	0.404
Design	1.190	0.440					0.690	0.310	Design	1.190	0.440					0.690	0.310
MRTT	1.207	0.434	********			********	1.030	0.351	MRTT	1.207	0.424	********			********	1.030	0.364
3	1.166	0.379								1.168	0.370						
Design	1.190	0.440					XXXXXX	XXXXXX	Design	1.190	0.440					XXXXXX	XXXXXX
MRTT	1.206	0.419	********						MRTT	1.208	0.410	********					
4	0.785	0.404					0.771	0.371		0.771	0.348					0.751	0.389
Design	0.780	0.410					0.720	0.340	Design	0.780	0.410					0.720	0.340
MRTT	0.825	0.444	********			********	0.731	0.331	MRTT	0.811	0.388	********			********	0.711	0.349
5	0.752	0.357					1.266	0.893		0.746	0.337					1.302	0.914
Design	0.780	0.410					1.220	0.840	Design	0.780	0.410					1.220	0.840
MRTT	0.792	0.397	********			********	1.226	0.853	MRTT	0.786	0.377	********			********	1.262	0.874
6	0.992	0.381					0.469	0.484		0.989	0.346					0.469	0.480
Design	1.030	0.410					0.410	XXXXXX	Design	1.030	0.410					0.410	XXXXXX
MRTT	1.032	0.421	********			********	0.429		MRTT	1.029	0.386	********			********	0.429	

GVN

Steam Seal Clearance Record

IP Rotor Clearances

Sheet 1

Date: 5/22/2006 Turbine Serial No. MLU106 Prepared by Bordenkircher

ROW NO.		Left Side Clearances						Right Side Clearances								
		A	B	C	D			A	B							
1	A	0.052	0.050	0.280	0.375			0.060	0.060							
	E	0.030	0.030	0.320	0.320			0.030	0.030							
	D	0.022	0.020	-0.040	0.055			0.030	0.030							
2	A	0.040	0.044	0.305	0.351			0.042	0.042							
	E	0.020	0.020	0.320	0.320			0.020	0.020							
	D	0.020	0.024	-0.015	0.031			0.022	0.022							
3	A	0.012	0.012	0.275	0.370			0.030	0.029							
	E	0.020	0.020	0.320	0.320			0.020	0.020							
	D	-0.008	-0.008	-0.045	0.050			0.010	0.009							
4	A	0.016	0.012	0.300	0.356			0.032	0.031							
	E	0.020	0.020	0.320	0.320			0.020	0.020							
	D	-0.004	-0.008	-0.020	0.036			0.012	0.011							
5	A	0.014	0.015	0.297	0.357			0.033	0.031							
	E	0.020	0.020	0.320	0.320			0.020	0.020							
	D	-0.006	-0.005	-0.023	0.037			0.013	0.011							
GV6	A	0.025	0.027	0.330	0.390			0.045	0.046							
	E	0.035	0.035	0.380	0.320			0.035	0.035							
	D	-0.010	-0.008	-0.050	0.070			0.010	0.011							
GV5	A	0.030	0.027	0.322	0.403			0.045	0.045							
	E	0.035	0.035	0.380	0.320			0.035	0.035							
	D	-0.005	-0.008	-0.058	0.083			0.010	0.010							
GV4	A	0.027	0.024	0.370	0.355			0.046	0.046							
	E	0.035	0.035	0.380	0.320			0.035	0.035							
	D	-0.008	-0.011	-0.010	0.035			0.011	0.011							
GV3	A	0.045	0.044	0.360	0.367			0.067	0.067							
	E	0.035	0.035	0.410	0.290			0.035	0.035							
	D	0.010	0.009	-0.050	0.077			0.032	0.032							
GV2	A	0.044	0.042	0.370	0.355			0.061	0.057							
	E	0.035	0.035	0.410	0.290			0.035	0.035							
	D	0.009	0.007	-0.040	0.065			0.026	0.022							
FG	A	0.012						0.090								
	E															
	D															
FG	A	0.012						0.087								
	E															
	D															
GE2	A	0.035	0.036	0.376	0.348			0.044	0.046							
	E	0.035	0.035	0.350	0.350			0.035	0.035							
	D	0.000	0.001	0.026	-0.002			0.009	0.011							

Comments:

"K" = .880"

A = Actual E = Expected D = Difference

Steam Seal Clearance Record

IP Rotor Clearances

Sheet 2

Date: 5/22/2006 Turbine Serial No. MLU106 Prepared by Bordenkircher

ROW NO.		Left Side Clearances A	B	C	D			Right Side Clearances A	B							
GE3	A	0.042	0.035	0.394	0.330			0.049	0.045							
	E	0.035	0.035	0.350	0.350			0.035	0.035							
	D	0.007	0.000	0.044	-0.020			0.014	0.010							
GE4	A	0.017	0.016	0.407	0.320			0.075	0.072							
	E	0.035	0.035	0.380	0.320			0.035	0.035							
	D	-0.018	-0.019	0.027	0.000			0.040	0.037							
GE5	A	0.014	0.015	0.402	0.317			0.046	0.040							
	E	0.035	0.035	0.380	0.320			0.035	0.035							
	D	-0.021	-0.020	0.022	-0.003			0.011	0.005							
GE6	A	0.016	0.014	0.390	0.332			0.061	0.055							
	E	0.035	0.035	0.380	0.320			0.035	0.035							
	D	-0.019	-0.021	0.010	0.012			0.026	0.020							
6	A	0.003	0.004	0.387	0.274			0.041	0.037							
	E	0.020	0.020	0.350	0.350			0.020	0.020							
	D	-0.017	-0.016	0.037	-0.076			0.021	0.017							
7	A	0.012	0.011	0.372	0.295			0.045	0.046							
	E	0.020	0.020	0.350	0.350			0.020	0.020							
	D	-0.008	-0.009	0.022	-0.055			0.025	0.026							
8	A	0.017	0.015	0.407	0.252			0.040	0.041							
	E	0.020	0.020	0.350	0.350			0.020	0.020							
	D	-0.003	-0.005	0.057	-0.098			0.020	0.021							
9	A	0.026	0.023	0.407	0.277			0.058	0.061							
	E	0.020	0.020	0.350	0.350			0.020	0.020							
	D	0.006	0.003	0.057	-0.073			0.038	0.041							
10	A	0.022	0.021	0.407	0.234			0.065	0.061							
	E	0.030	0.030	0.350	0.290			0.030	0.030							
	D	-0.008	-0.009	0.057	-0.056			0.035	0.031							
	A															
	E															
	D															
	A															
	E															
	D															
	A															
	E															
	D															
	A															
	E															
	D															

Comments:

"K"= .880"

A = Actual E = Expected D = Difference

Packing Butt Gaps

Westinghouse GS Casing and Stationary Blade Shroud

Date(m/d/y) 5/20/2006 Turbine S/N: MLU106 Prepared by Rahn

Data [ ] (As Found/Final) **Section** [IP] (HP/LP) Notes: 1. Packing above diaphragm record as PLUS (+).
2. Packing below diaphragm record as MINUS (-).

Stage	Lower Half		Upper Half		Packing Butt Gap		Amount to	
	Left Mils	Right Mils	Left Mils	Right Mils	Total	Design	Machine per segment	# of Segments
GV OT G1	7	-41	6	16	-12	12		**OK**
GV OT G2	-20	-4	-6	9	-21	12		**OK**
GV IN G3	22	-1	-18	-15	-12	12		**OK**
GV IN G4	19	18	-68	19	-12	12		**OK**
GV IN G5	1	8	0	-46	-37	12		**OK**
GV R6	-41	42	-231	214	-16	12		**OK**
GV R5	25	0	-154	111	-18	12		**OK**
GV R4	41	0	33	-96	-22	12		**OK**
GV R3	-9	55	-37	-21	-12	12		**OK**
GV R2	46	-25	-27	-36	-42	12		**OK**
GV R1	-123	113	-7	0	-17	12		**OK**
GE R1	14	35	-42	-55	-48	12		**OK**
GE R2	68	-39	-38	-6	-15	12		**OK**
GE R3	93	-38	-76	-3	-24	12		**OK**
GE R4	-30	1	-60	71	-18	12		**OK**
GE R5	-64	6	5	5	-48	12		**OK**
GE R6	73	-11	-37	-46	-21	12		**OK**
GE IN G6	10	8	6	-47	-23	12		**OK**
GE IN G7	-11	-6	-13	-3	-33	12		**OK**
GE IN G8	-14	5	-9	6	-12	12		**OK**
GE OT G9	-8	-19	-5	20	-12	12		**OK**
GE OT G10	-9	-43	26	-3	-29	12		**OK**

Reaction Blading Clearance Record

IP Rotor Clearances

Date: 5/22/2006 Turbine Serial No. MLU106 Prepared by Vickers

ROW NO.		Left Side Clearances							Right Side Clearances							
		A	B	E	F	L	M		A	B	E	F	L	M		
GV1	A	0.761	0.608	0.937	0.620	0.207	0.186		0.880	0.571	0.787	0.610	0.230	0.220		
	E	x	0.560	0.750	0.440	0.035	0.035		x	0.560	0.750	0.440	0.035	0.035		
	D		0.048	0.187	0.180	0.172	0.151			0.011	0.037	0.170	0.195	0.185		
GV2	A	1.167	0.394	1.131	0.391	0.019	0.021		1.167	0.384	1.117	0.404	0.052	0.055		
	E	0.810	0.440	0.690	0.310	0.035	0.035		0.810	0.440	0.690	0.310	0.035	0.035		
	D	0.357	-0.046	0.441	0.081	-0.016	-0.014		0.357	-0.056	0.427	0.094	0.017	0.020		
GV3	A	1.666	0.379	1.031	1.511	0.050	0.040		1.168	0.370	1.031	1.529	0.075	0.055		
	E	0.810	0.440	x	x	0.035	0.035		0.810	0.440	x	x	0.035	0.035		
	D	0.856	-0.061			0.015	0.005		0.358	-0.070			0.040	0.020		
GV4	A	0.785	0.404	0.771	0.371	0.190	0.035		0.771	0.348	0.751	0.389	0.195	0.044		
	E	0.780	0.410	0.720	0.340	0.035	0.035		0.780	0.410	0.720	0.340	0.035	0.035		
	D	0.005	-0.006	0.051	0.031	0.155	0.000		-0.009	-0.062	0.031	0.049	0.160	0.009		
GV5	A	0.752	0.357	1.266	0.893	0.035	0.036		0.746	0.337	1.302	0.914	0.045	0.042		
	E	0.780	0.410	1.220	0.840	0.035	0.035		0.780	0.410	1.220	0.840	0.035	0.035		
	D	-0.028	-0.053	0.046	0.053	0.000	0.001		-0.034	-0.073	0.082	0.074	0.010	0.007		
GV6	A	0.992	0.381	0.469	0.484	0.035	0.036		0.989	0.346	0.469	0.480	0.050	0.044		
	E	1.030	0.410	0.410	x	0.035	0.035		1.030	0.410	0.410	x	0.035	0.035		
	D	-0.038	-0.029	0.059		0.000	0.001		-0.041	-0.064	0.059		0.015	0.009		
	A															
	E															
	D															
GE1	A	0.942	0.647	0.776	0.676	0.200	0.194		0.947	0.639	0.811	0.657	0.226	0.217		
	E	0.810	0.500	0.810	0.500	0.035	0.035		0.810	0.500	0.810	0.500	0.035	0.035		
	D	0.132	0.147	-0.034	0.176	0.165	0.159		0.137	0.139	0.001	0.157	0.191	0.182		
GE2	A	1.159	0.365	1.117	0.397	0.035	0.032		1.144	0.383	1.131	0.421	0.045	0.045		
	E	0.750	0.380	0.750	0.380	0.035	0.035		0.750	0.380	0.750	0.380	0.035	0.035		
	D	0.409	-0.015	0.367	0.017	0.000	-0.003		0.394	0.003	0.381	0.041	0.010	0.010		
GE3	A	1.154	0.346	1.284	1.574	0.045	0.045		1.133	0.333	1.187	1.587	0.049	0.049		
	E	0.750	0.380	x	x	0.035	0.035		0.750	0.380	x	x	0.035	0.035		
	D	0.404	-0.034			0.010	0.010		0.383	-0.047			0.014	0.014		
GE4	A	0.785	0.350	0.740	0.415	0.130	0.015		0.760	0.341	0.735	0.414	0.200	0.058		
	E	0.720	0.340	0.780	0.410	0.035	0.035		0.720	0.340	0.780	0.410	0.035	0.035		
	D	0.065	0.010	-0.040	0.005	0.095	-0.020		0.040	0.001	-0.045	0.004	0.165	0.023		
GE5	A	0.764	0.321	1.263	0.930	0.011	0.012		0.744	0.316	1.279	0.925	0.055	0.064		
	E	0.720	0.340	1.280	0.910	0.035	0.035		0.720	0.340	1.280	0.910	0.035	0.035		
	D	0.044	-0.019	-0.017	0.020	-0.024	-0.023		0.024	-0.024	-0.001	0.015	0.020	0.029		
GE6	A	1.013	0.340	0.437	0.580	0.014	0.015		1.109	0.343	0.445	0.568	0.060	0.066		
	E	0.970	0.340	0.470	x	0.035	0.035		0.970	0.340	0.470	x	0.035	0.035		
	D	0.043	0.000	-0.033		-0.021	-0.020		0.139	0.003	-0.025		0.025	0.031		

Comments:

"K" = .880"

A = Actual E = Expected D = Difference

NOTES:

1. (triangle 1) THESE CLEARANCES RESULT AFTER UPPER HALVES ARE IN PLACE. RECORD ACTUAL CLEARANCES UPPER HALVES OFF.
2. FOR ALL OTHER VIEWS AND DIMENSIONS SEE ORIGINAL ROTOR CLEARANCE 775J709.
3. CLEARANCES ON DRAWING WERE TAKEN FROM INITIAL SHOP ASSEMBLY AND ADJUSTED FOR NEW BLADES WITH DIFFERENT AXIAL SHROUD WIDTHS.

SYMBOLS:

A. P.S. 84800WJ PT. I ASSEMBLY VERIFICATION OF STEAM TURBINE.

BLADE AXIAL CLEARANCES - GENERATOR END (R.H. BLADING)

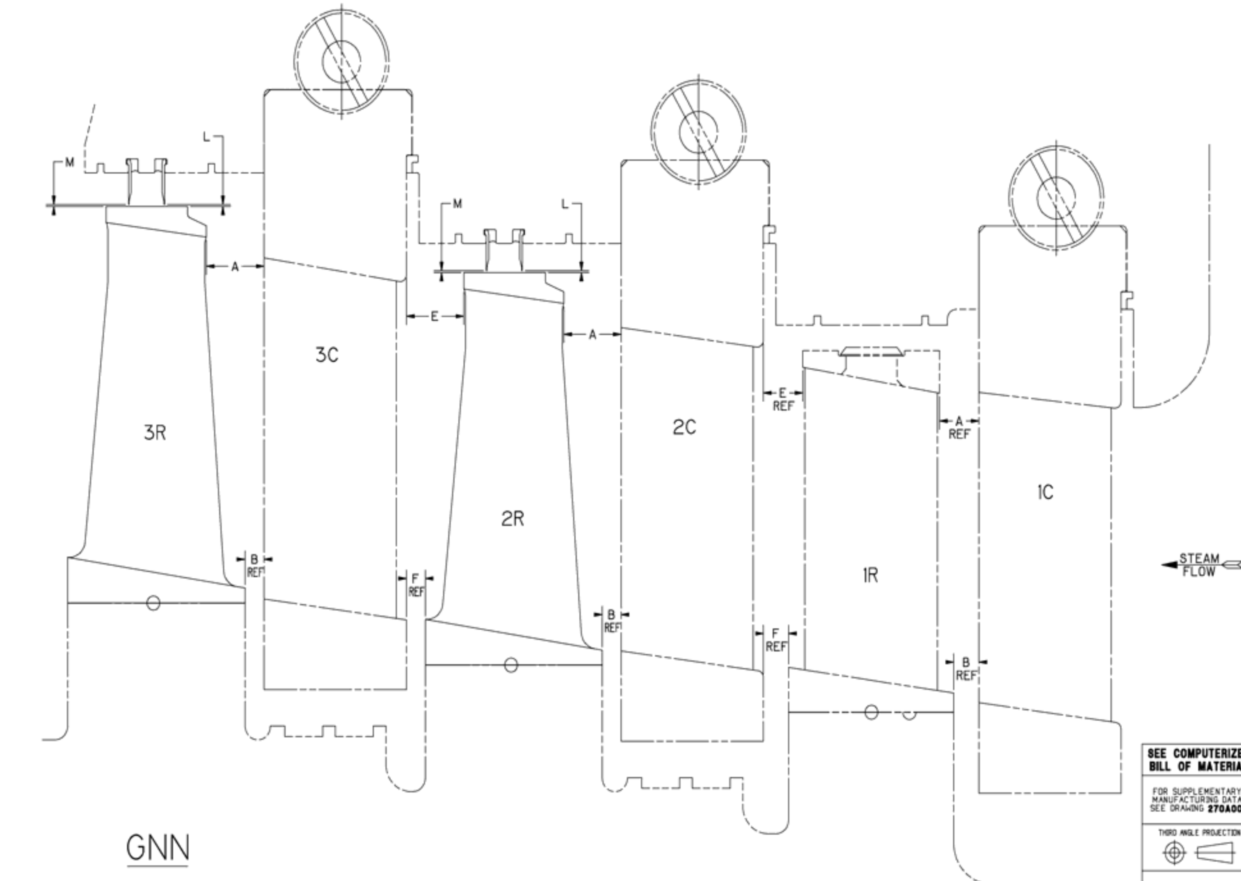
ROW NO.	ROTOR BLADES												CYLINDER BLADES					
	INLET						OUTLET						INLET			OUTLET		
	A			B			E			F								
	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT
1	.81	—	—	.50	—	—	.81	—	—	.50	—	—	—	—	—	—	—	—
2	1.13			.38	—	—	1.13			.38	—	—	—	—	—	—	—	—
3	1.13			.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—

TOLERANCE: ±.020

BLADE RADIAL CLEARANCES - GNN (triangle 1)

ROW NO.	ROTOR						CYLINDER					
	INLET						OUTLET					
	L			M								
	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT	NOM	ACT LEFT	ACT RIGHT	NOM	ACT	ACT
1	—			—			—	—	—	—	—	—
2	.035			.035			—	—	—	—	—	—
3	.035			.035			—	—	—	—	—	—

TOLERANCE: +.005/-.002



GNN

ENGINEERING INFO ONLY

THIS DRAWING IS FOR REPLACEMENT OF IP PADDLE BLADES ONLY. DO NOT ADD ANY ITEMS TO THIS DRAWING WITHOUT CONTACTING SERVICE ENGINEERING FIRST. SEE 2125J83 IP PADDLE BLADE REPLACEMENT INFO.

SEE COMPUTERIZED BILL OF MATERIAL	PART NAME PB9D13683O1O1	DRAW ADRA	DESIGN SPECIFICATION 30002115	SHOP ORDER 13A3161-1

FOR SUPPLEMENTARY MANUFACTURING DATA SEE DRAWING **270A001**

THIRD ANGLE PROJECTION

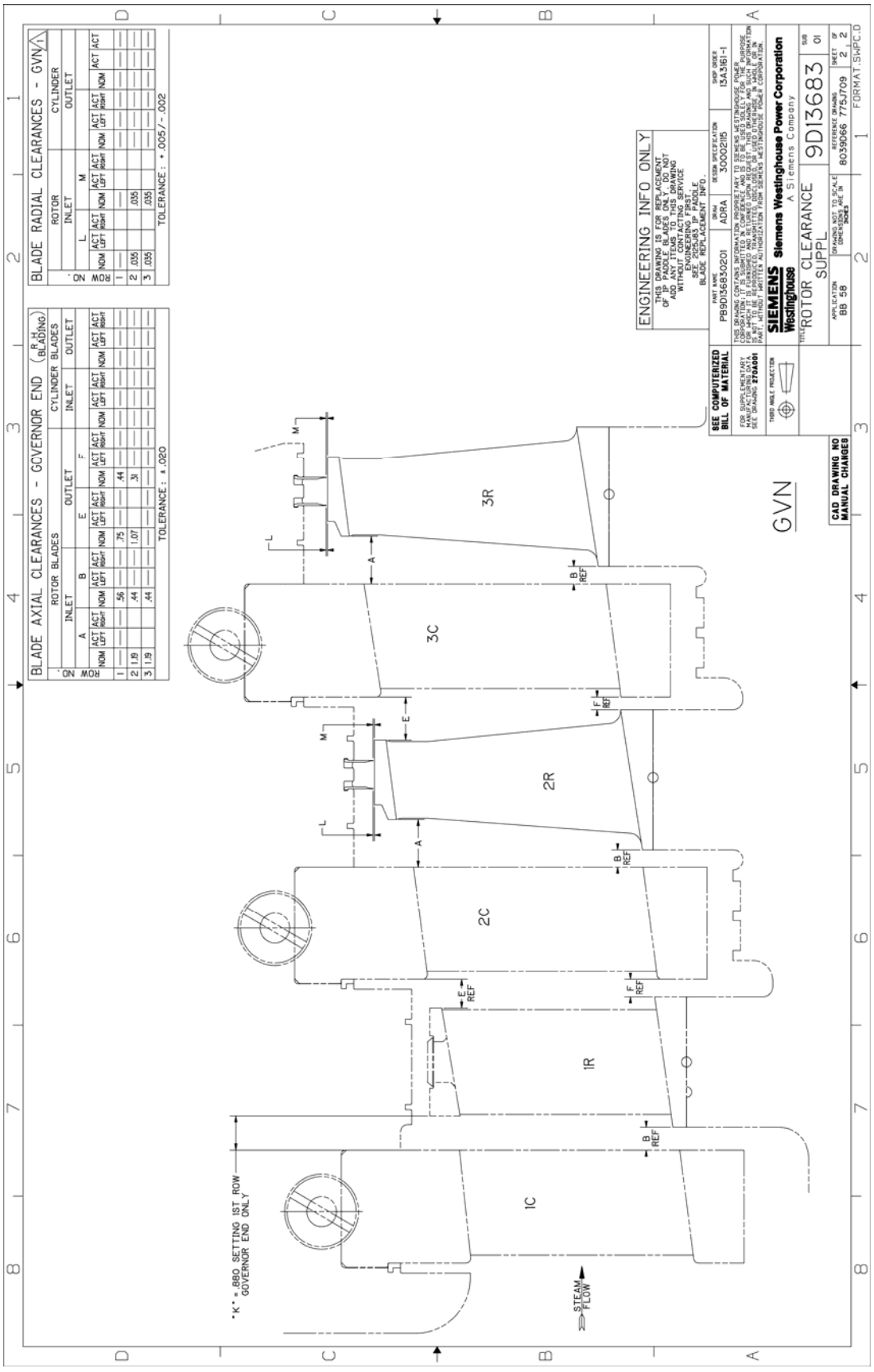
SIEMENS Westinghouse **Siemens Westinghouse Power Corporation**
A Siemens Company

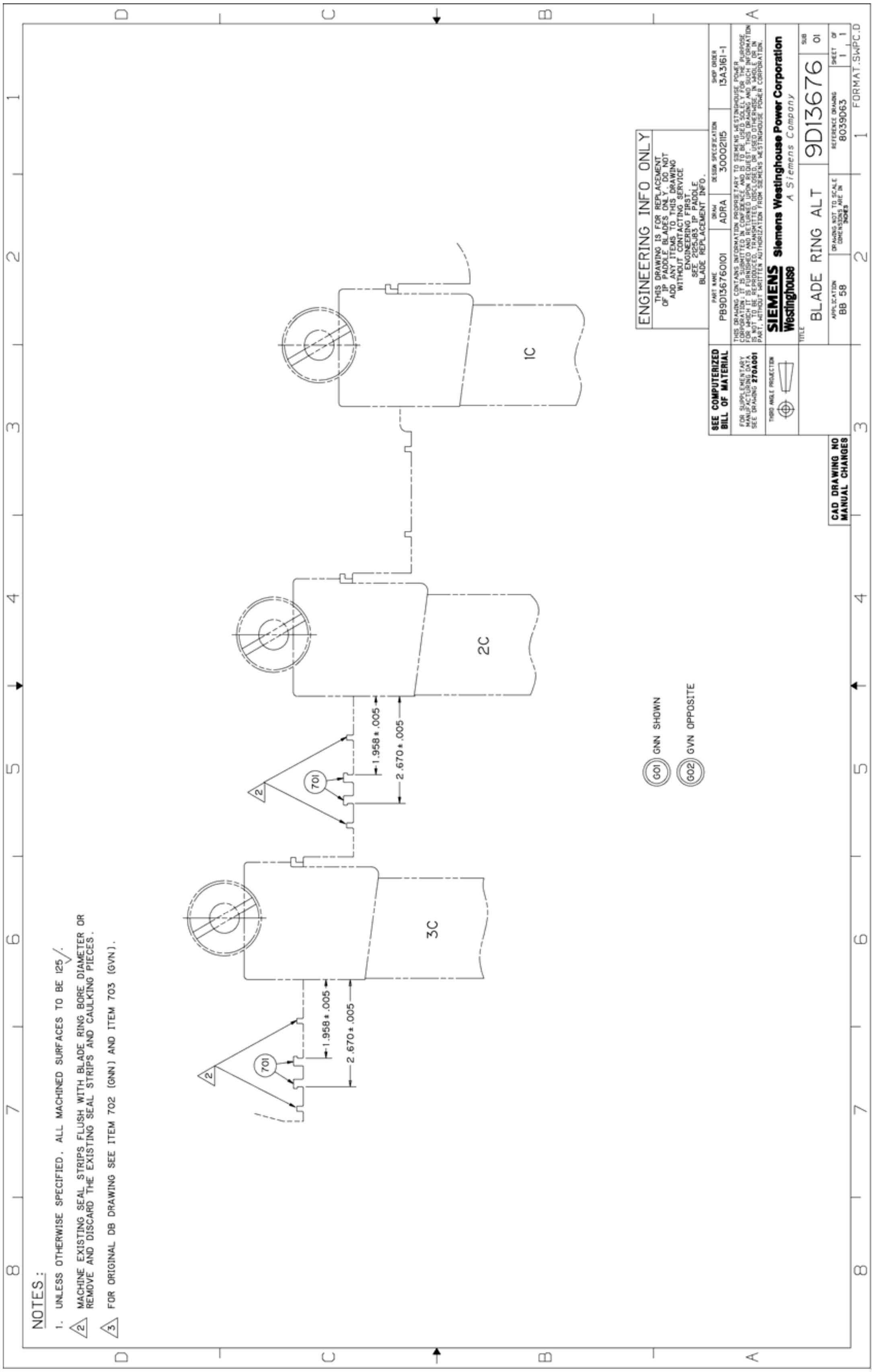
TITLE ROTOR CLEARANCE SUPPL — 9D13683 — SUB 01

APPLICATION	DRAWING NOT TO SCALE DIMENSIONS ARE IN INCHES	REFERENCE DRAWING	SHEET	OF
BB 58		8039D66 775J709	1	2

CAD DRAWING NO MANUAL CHANGES

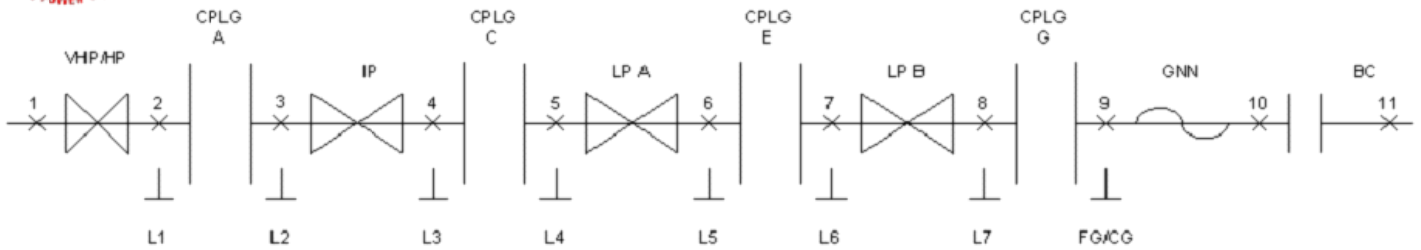
FORMAT.SWPC.D


BLADE AXIAL CLEARANCES - GOVERNOR END (R.H. BLADING)
BLADE RADIAL CLEARANCES - GVN
TOLERANCE : ± .020
TOLERANCE : + .005/- .002
ENGINEERING INFO ONLY
SEE COMPUTERIZED BILL OF MATERIAL
SIEMENS Westinghouse
Siemens Westinghouse Power Corporation
A Siemens Company
TITLE ROTOR CLEARANCE SUPPL
9D13683
CAD DRAWING NO MANUAL CHANGES
GVN
1C
1R
2C
2R
3C
3R
"K" = .860 SETTING IST ROW GOVERNOR END ONLY
STEAM FLOW
FORMAT.SHPC.D


NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL MACHINED SURFACES TO BE 125
2 MACHINE EXISTING SEAL STRIPS FLUSH WITH BLADE RING BORE DIAMETER OR REMOVE AND DISCARD THE EXISTING SEAL STRIPS AND CAULKING PIECES.
3 FOR ORIGINAL DB DRAWING SEE ITEM 702 (GNN) AND ITEM 703 (GVN).
1C
2C
3C
701
1.958±.005
2.670±.005
G01 GNN SHOWN
G02 GVN OPPOSITE
ENGINEERING INFO ONLY
THIS DRAWING IS FOR REPLACEMENT OF IP PADDLE BLADES ONLY. DO NOT ADD ANY ITEMS TO THIS DRAWING WITHOUT CONTACTING SERVICE ENGINEERING FIRST.
SEE 2125J83 IP PADDLE BLADE REPLACEMENT INFO.
SEE COMPUTERIZED BILL OF MATERIAL
PART NAME PB9D13676O101
DRAW ADRA
DESIGN SPECIFICATION 3000215
SHOP ORDER 13A361-1
SIEMENS Westinghouse
Siemens Westinghouse Power Corporation
A Siemens Company
TITLE BLADE RING ALT
9D13676
SUB 01
APPLICATION BB 58
REFERENCE DRAWING 8039D63
SHEET 1 OF 1
CAD DRAWING NO MANUAL CHANGES
FORMAT.SWPC.D

Rotor Axial L Reference Readings

American Electric Power
Ohio Power Company
Mitchell Station
Unit #1



Date	L1 rs	L2 ls	L3 ls	L4 ls	L5 ls	L6 ls	L7 ls	FG
6/3/2006	5.767	15.183	15.471*	18.366*		4.955*		

CPLG A spacer is 1.405" **CPLG C** spacer is 1.211"

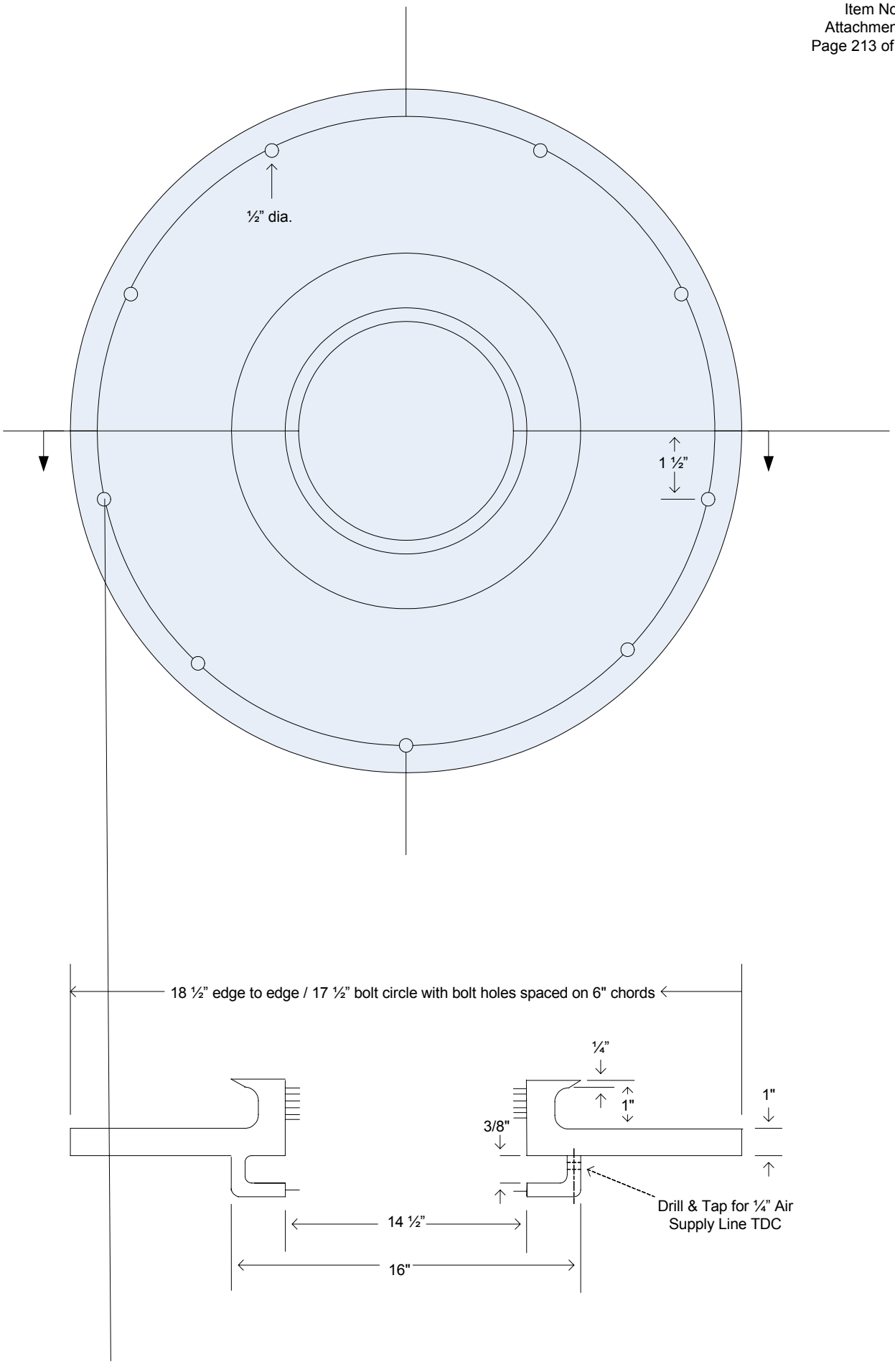
IP Rotor TD 39415

IP "K" Dimension is 0.920" due to new Row 1 Stationary Blading.
VHP/HP "K" Dimension continues to be 0.369".
LPA "K" Dimension continues to be 0.755"

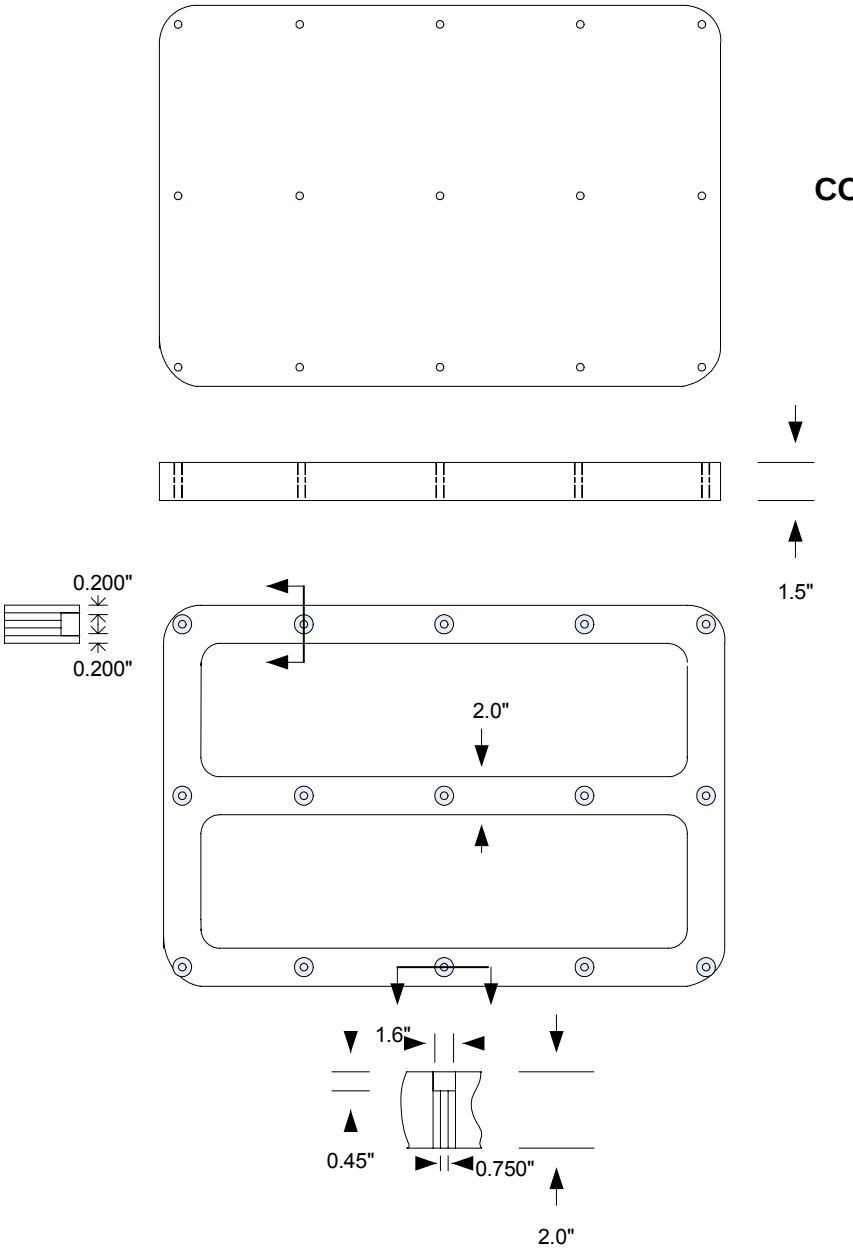
L1 is to Welded Key Stock Right Side of Machine Pedestal
L6 is to Coupling Guard Mounting Flange
L reference readings are to permanent structures of bearing pedestals.
* denotes a calculated measurement, not a physical dimension. GVN side of Thrust bearing loaded.

MITCHELL-1 IP DATE 5/22/06 TIME Days

LOCATION	SAG	RAW LEFT	RAW BOT	RAW RIGHT	RELATIVE LEFT	RELATIVE BOT	RELATIVE RIGHT	TRUE ELEV	TARGET LEFT	TARGET BOT	TARGET RIGHT	TRUE ELEV	ELEV CHNG	MOVE SIDE-WAYS	SHIM CHNG LEFT	SHIM CHNG RIGHT
T-3 Oil Bore	0.005				0	0.005	0	0.005				0	0.005	0	0.005	0.005
R2 Outer Gland	9				0	9	0	9				0	9	0	9	9
Gland Bore Set Point	0	483	483	484	0	0	1	-0.5	0	0	0	0	-0.5	-0.5	-1	0
R3 Inner Gland	1	649	644	667	0	-4	18	-13	0	-11	10	-16	3	-4	-1	7
R5 Inner Gland	2	649	656	663	0	9	14	2	0	2	8	-2	4	-3	1	7
R6-SS-GVN **#2 GVN**	4	459	459	457	2	6	0	5	0	11	3	9.5	-4.5	2.5	-2	-7
R4-SS-GVN	6	88	80	78	10	8	0	3	0	-2	9	-6.5	9.5	9.5	19	0
R3-SS-GVN **#1 GVN**	6				0	6	0	6	7	16	0	12.5	-6.5	-3.5	-10	-3
R1-SS-GVN	7	173	216	173	0	50	0	50	4	48	0	46	4	-2	2	6
FG-GVN	7	474	428	550	0	-39	76	-77	0	-58	61	-88.5	11.5	-7.5	4	19
FG-GNN	7	486	408	539	0	-71	53	-97.5	0	-50	81	-90.5	-7	14	7	-21
R1-SS-GNN **#1 GNN**	7	267	279	273	0	19	6	16	0	18	3	16.5	-0.5	-1.5	-2	1
R3-SS-GNN	6				0	6	0	6	0	7	14	0	6	7	13	-1
R4-SS-GNN **#2 GNN**	6	92	105	110	0	19	18	10	0	1	6	-2	12	-6	6	18
R6-SS-GNN	4	485	493	502	0	12	17	3.5	0	7	4	5	-1.5	-6.5	-8	5
R6 Inner Gland	2	664	651	660	4	-7	0	-9	1	-10	0	-10.5	1.5	1.5	3	0
R8 Inner Gland	1	669	644	658	11	-13	0	-18.5	2	-15	0	-16	-2.5	4.5	2	-7
Gland Bore Set Point	0	492	492	491	1	1	0	0.5	0	0	0	0	0.5	0.5	1	0
R9 Outer Gland	9				0	9	0	9	0	0	0	0	9	0	9	9
T-4 Oil Bore	6				0	6	0	6	1	17	0	16.5	-10.5	-0.5	-11	-10


½" dia.
1 ½"
18 ½" edge to edge / 17 ½" bolt circle with bolt holes spaced on 6" chords
¼"
1"
3/8"
1"
Drill & Tap for ¼" Air
Supply Line TDC
14 ½"
16"

Mitchell #1 Hydrogen Cooler Cooler & Reversing Chamber Spacer



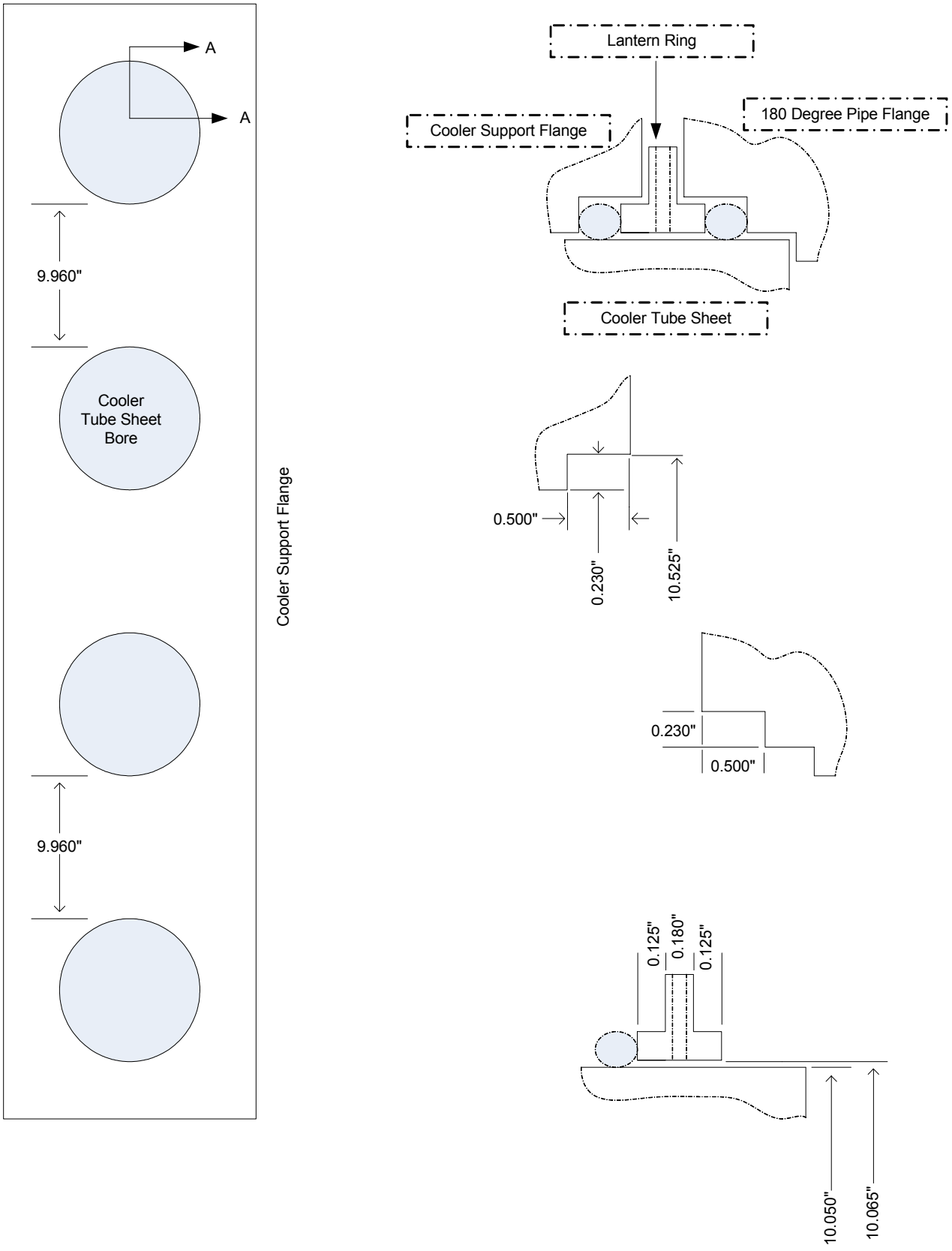
Use original parts to plot through bolt holes, eye bolt threaded holes and jack screw threaded holes.

Tolerances on these dimensions =/- 0.025".

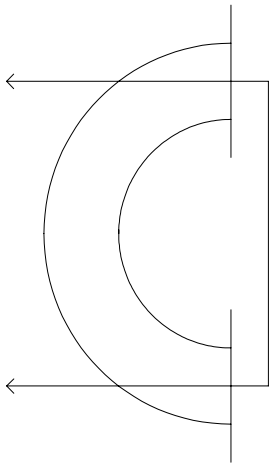
The cover thickness may go to 1.250" but no thicker than 1.5".

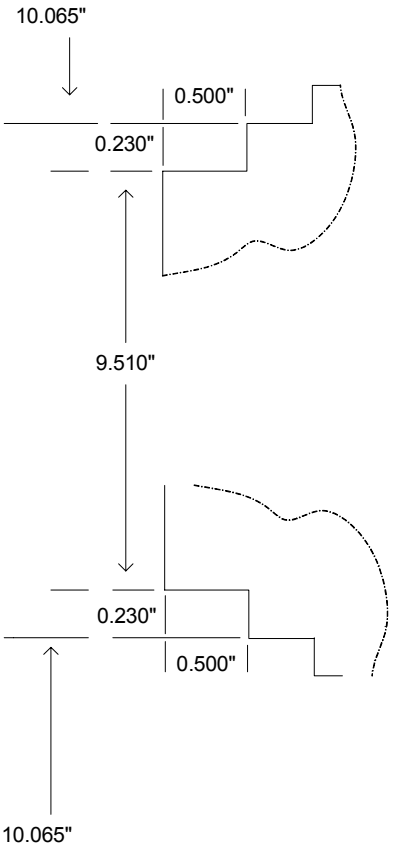
The reversing chamber spacer thickness is best held at 2.0".

Dimensions of the Seal Oil Skid Cooler Components page 1/2

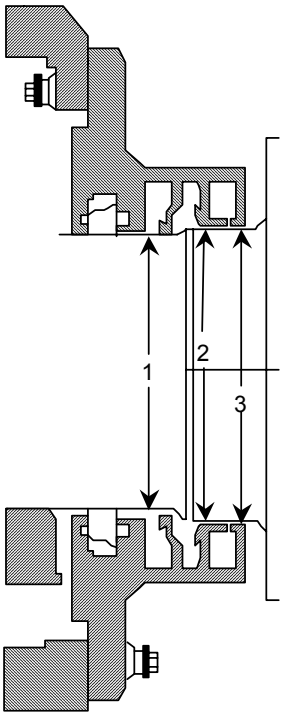


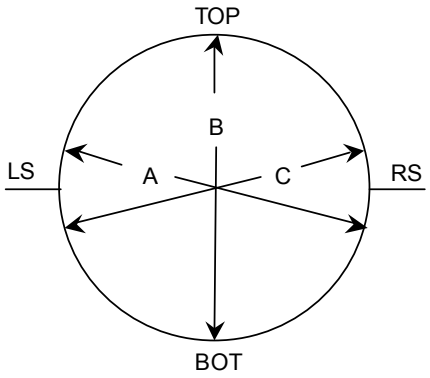
Dimensions of the Seal Oil Skid Cooler Components page 2/2





CUSTOMER:	AEP
LOCATION/UNIT #:	
GENERATOR CLEARANCES: LABYRINTH SEAL	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	GENERATOR DWG.:





DIM. / END	A	B	C	Shaft OD	Clearance
DIA. NO. 1 TE					
DIA. NO. 2 TE					
DIA. NO. 3 TE					
DIA. NO. 1 EE	20.937	20.931	20.931	20.865	0.068
DIA. NO. 2 EE	22.513	22.516	22.515	22.454	0.039
DIA. NO. 3 EE	22.512	22.514	22.516	22.454	0.040

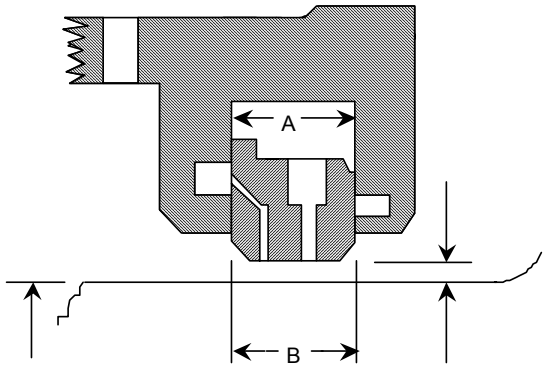
Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _____ Date: _____

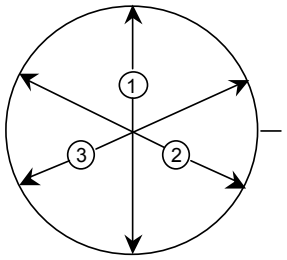
As Charted _____ Reviewed By Turb Coord.: _____ Date: _____

AEP/RSO

CUSTOMER:	AEP
LOCATION/UNIT #:	
GENERATOR HYDROGEN SEAL CLEARANCES	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.: GENERATOR	DWG.:



(JOURNAL DIAMETER) (SEAL RING I.D.)



LOCATION	DIM A = GROOVE WIDTH	DIM B = RING THICKNESS	CLEARANCE
TOP	1.911	1.903	0.008
BOTTOM	1.911	1.903	0.008
RIGHT SIDE	1.910	1.903	0.007
LEFT SIDE	1.910	1.902	0.008

Design clearance: .0071/2 - .009

RADIAL CLEARANCES			
LOCATION	DIM C = JOURNAL	DIM D = RING I.D.	CLEARANCE
1	20.865	20.864	0.009
2	20.865	20.879	0.014
3	20.865	20.876	0.010

Design clearance: .009-.011 on diameter

FLATNESS CHECK	
READINGS > 0.00"	LOCATION (IB/OB SIDE, DEG. FROM A.R. PIN)
0.0015	AR = 90d to 170 d
0.002	AR = 120 d to 150 d

Tool # Used _____ Cal. Due Date _____
As Found _____

As Assembled _____

1st Reading Taking By:_____
2nd Reading Taking By:_____
Reviewed By Supervisor:_____
Verified By Plant REP:_____
Reviewed By Coordinator:_____

Vibration Data Sheet

Date(m/d/y) 6/19/2006 Turbine Serial No. MLU106 Prepared by

DATE TIME RPM or MW	Position	#1 BRG		#2 BRG		#3 BRG		#4 BRG		#5 BRG		#6 BRG		#7 BRG		#8 BRG		#9 BRG		#10 BRG		#11 BRG	
		AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG	AMP	DEG
6/17/2006 3:16	LS	0.9	299	0.8	122	1.1	65	1.1	40	2.1	285	2.3	161	1.2	8	3.0	128	0.6	168	1.2	10	0.4	215
495 RPM -RunOut	RS	0.9	213	0.8	35	1.3	342	0.9	308	2.5	176	2.3	55	1.5	262	1.9	37	0.6	55	1.2	108	0.4	308
6/18/2006 1:00	LS	1.2	269	1.2	348	3.5	325	4.2	302	5.7	253	4.1	147	2.8	133	1.5	153	1.9	293	1.6	97	2.7	239
43 MW	RS	1.6	180	1.1	287	3.4	238	4.4	215	5.3	143	5.1	62	4.0	51	2.4	137	2.9	241	2.3	51	5.3	298
6/18/2006 2:00	LS	1.3	267	1.1	352	3.2	326	4.1	298	5.6	251	4.0	147	2.8	133	1.4	156	1.9	299	1.6	103	2.8	237
84 MW	RS	1.6	175	1.1	297	3.2	237	4.2	210	5.3	142	5.2	61	4.1	51	2.5	137	2.8	242	2.2	53	5.2	297
6/18/2006 3:45	LS	1.6	253	0.9	19	3.2	322	3.8	298	5.5	254	4.1	156	2.5	147	1.4	150	2.2	305	1.8	116	2.8	241
100 MW	RS	2.0	168	0.7	348	2.8	238	4.2	200	5.6	141	5.1	70	3.7	62	2.5	139	2.8	255	2.3	68	5.4	296
6/18/2006 5:30	LS	1.2	266	1.2	349	3.4	328	3.9	292	5.6	261	4.4	158	2.8	145	1.6	149	2.1	278	1.7	90	2.5	230
145 MW	RS	1.4	170	0.8	293	2.8	244	4.4	200	5.8	141	4.5	67	3.2	56	2.3	138	3.2	247	2.7	51	5.3	292
6/18/2006 6:00	LS	1.6	268	0.6	14	2.8	332	4.4	290	5.6	259	4.1	152	2.7	140	1.5	152	1.9	295	1.6	105	2.8	235
220 MW	RS	1.8	178	0.6	28	2.2	241	4.8	202	5.9	147	4.9	61	3.6	55	2.4	142	2.8	247	2.3	55	5.3	294
6/18/2006 6:25	LS	1.8	265	1.0	11	3.8	325	3.6	302	4.8	256	3.8	150	2.5	133	1.5	156	1.9	297	1.5	117	2.6	238
315 MW	RS	2.5	184	0.7	15	3.5	235	3.8	212	5.2	146	4.8	63	3.5	54	2.5	138	2.6	243	2.1	48	4.9	298
6/18/2006 9:20	LS	1.8	298	2.8	8	2.9	306	4.3	295	4.8	258	3.9	153	2.8	144	1.6	175	2.0	303	1.7	144	4.1	235
435 MW	RS	1.2	223	2.0	269	3.1	209	4.4	204	4.7	146	5.1	67	4.2	58	3.1	138	2.4	243	1.9	70	6.5	297
6/19/2006 0:00	LS	1.9	281	2.5	7	3.5	321	4.9	288	5.0	260	3.6	153	2.5	141	1.6	162	1.8	307	1.5	125	3.7	242
440 MW	RS	2.2	205	2.4	292	3.2	225	4.9	200	5.1	151	4.4	68	3.3	60	2.8	142	2.4	241	2.0	56	5.3	302
6/19/2006 3:05	LS	1.9	282	2.8	4	3.5	321	4.9	288	5.2	261	3.5	154	2.4	144	1.7	154	1.9	310	1.6	131	3.4	245
500 MW	RS	2.2	202	2.5	290	3.2	225	4.9	200	5.4	149	4.3	66	3.4	58	2.7	144	2.6	251	2.0	70	5.3	301
6/19/2006 6:00	LS	1.6	290	2.4	8	3.4	329	4.8	288	5.2	260	3.6	154	2.8	149	1.6	168	1.9	324	1.6	152	3.6	258
600 MW	RS	2.0	212	2.1	286	3.1	232	4.6	204	4.9	150	4.9	68	4.1	61	2.9	141	2.0	258	1.7	87	5.2	308

Comments:

Operations is operating the hydrogen seal oil skid with seal delivery temperatures of 115 F and 145 F to the hydrogen & air sides of the electric generator shaft seal rings, respectively. This condition is thermally twisting the rings in their gland operating groove. This condition is also generating a dampening effect on the vibration mode of the number eleven bearing. Any balance moves for the number eleven bearing would be unpredictable.

Note: The Bearing Eleven readings at 435 MWs of 6/18/2006 are with the air/hydrogen seal oil temperature balanced at 130 F, it is expected that hydrogen seal rings have not completely restored their shape yet.

Vibration Data Sheet

Date(m/d/y) 6/19/2006 Turbine Serial No. MLU106 Prepared by

DATE TIME RPM or MW	Position	#1 BRG AMP	#1 BRG DEG	#2 BRG AMP	#2 BRG DEG	#3 BRG AMP	#3 BRG DEG	#4 BRG AMP	#4 BRG DEG	#5 BRG AMP	#5 BRG DEG	#6 BRG AMP	#6 BRG DEG	#7 BRG AMP	#7 BRG DEG	#8 BRG AMP	#8 BRG DEG	#9 BRG AMP	#9 BRG DEG	#10 BRG AMP	#10 BRG DEG	#11 BRG AMP	#11 BRG DEG
6/19/2006 7:59	LS	1.4	279	3.4	346	3.4	312	5.1	290	5.0	260	3.7	154	2.8	148	1.7	175	1.8	338	1.5	222	4.4	268
733 MW	RS	1.9	200	3.0	270	3.2	215	4.7	208	4.4	150	4.9	67	4.1	60	3.1	136	1.5	238	1.5	36	5.2	319
6/19/2006 10:53	LS	1.5	283	3.6	345	3.0	311	4.7	285	5.0	260	3.6	154	2.5	148	1.8	174	1.6	353	1.6	257	4.9	266
795 MW	RS	1.8	202	3.2	268	3.6	213	4.5	200	4.7	149	4.6	67	3.6	61	3.3	137	1.4	134	1.4	358	5.4	318
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						
	LS																						
	RS																						

Comments:

Operations is operating the hydrogen seal oil skid with seal delivery temperatures of 115 F and 145 F to the hydrogen & air sides of the electric generator shaft seal rings, respectively. This condition is thermally twisting the rings in their gland operating groove. This condition is also generating a dampening effect on the vibration mode of the number eleven bearing. Any balance moves for the number eleven bearing would be unpredictable.

Main Oil Pump Housing Shim Pattern

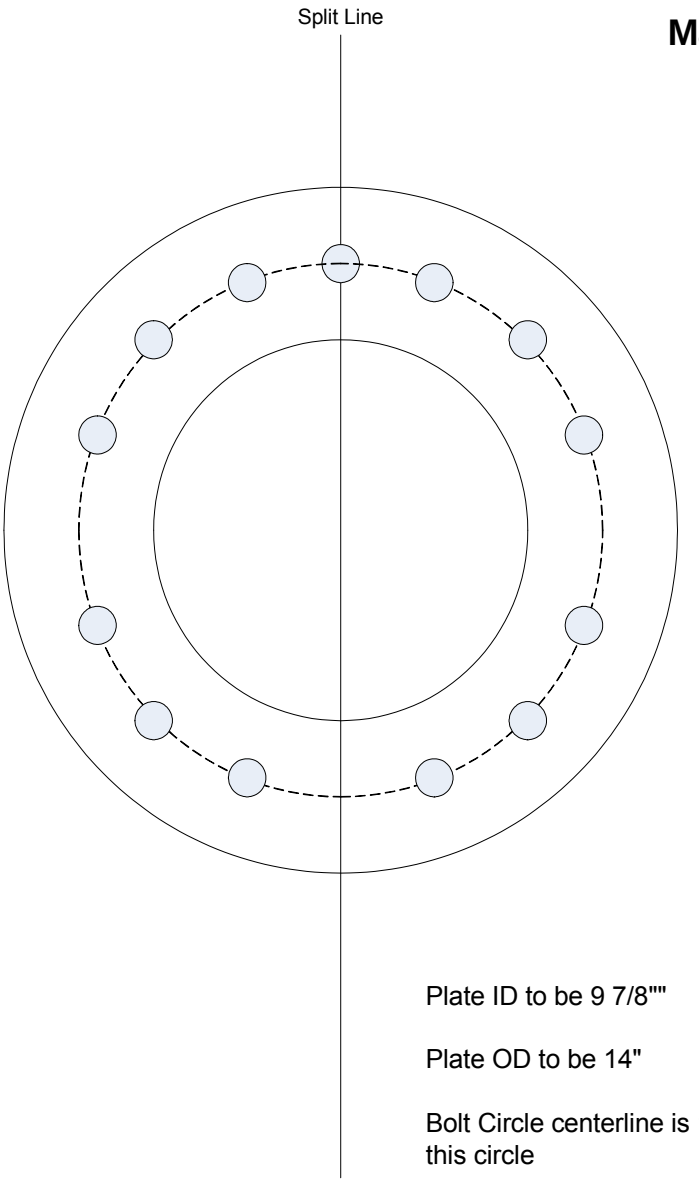


Plate ID to be 9 7/8""

Plate OD to be 14"

Bolt Circle centerline is 12 1/2", Twelve holes evenly spaced on this circle

Bolt Holes to be bored to 13/16"

Thirteenth hole to be midpoint of adjacent bolt holes' chord and bored to 13/16"

Split of the ring through the center of the thirteenth hole

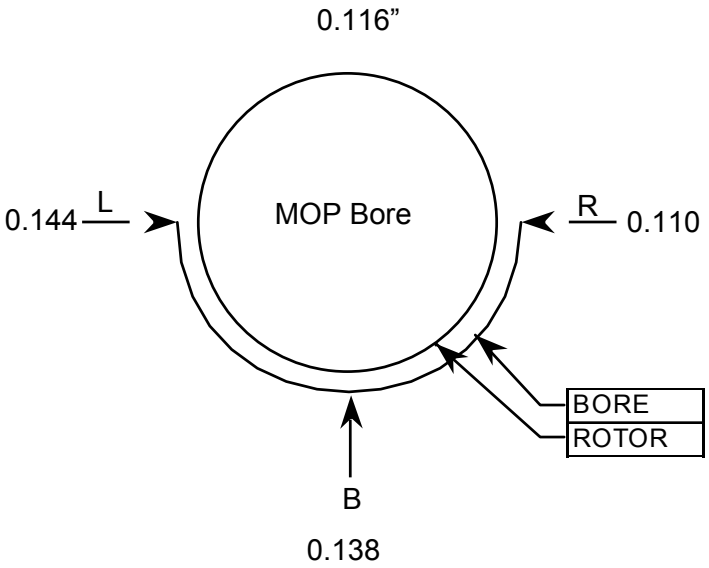
Finish of flat faces to be 32 or better

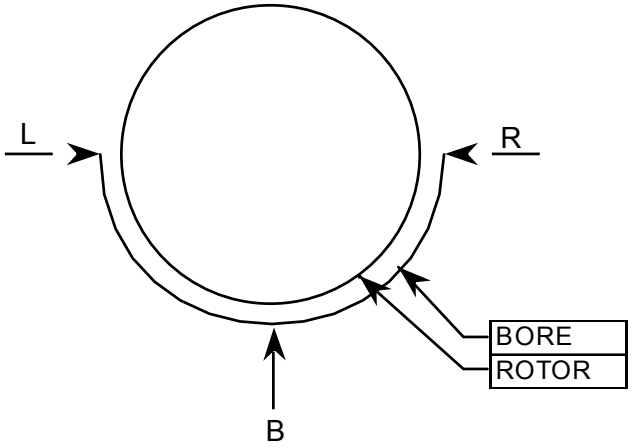
Flat faces to be parallel

Produce these quantities

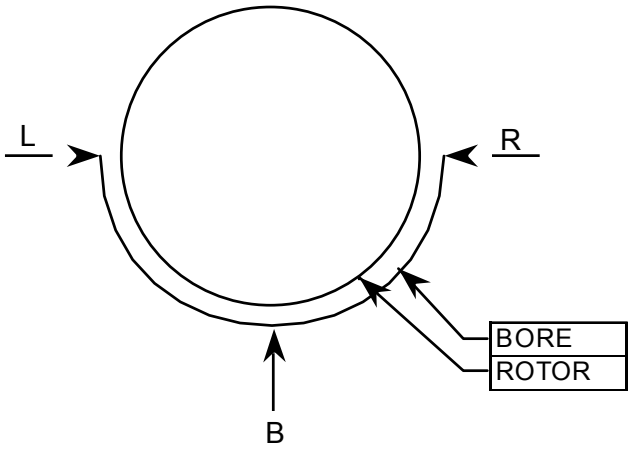
- 4 – 0.500" thick
- 6 – 0.250" thick
- 6 – 0.100" thick

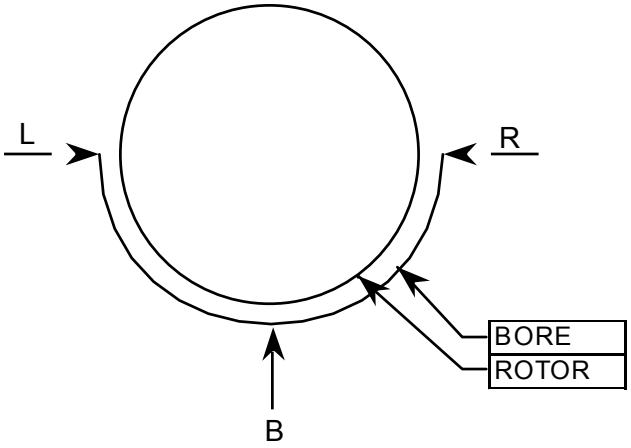
American Electric
Mitchell Station Unit #1
Main Oil Pump Bore Readings
Ohio Power Company 5-29-2006





I



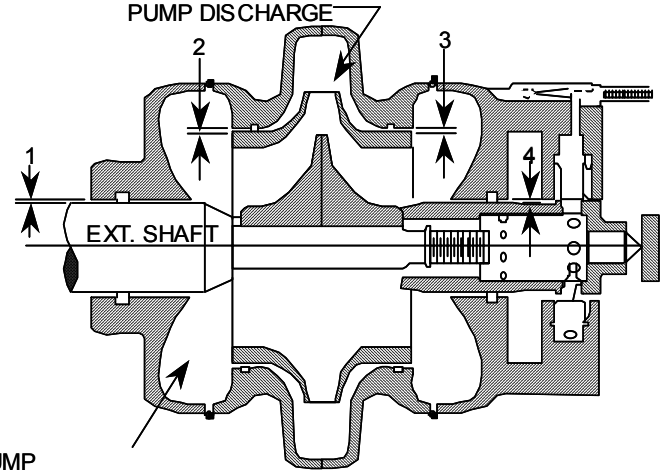


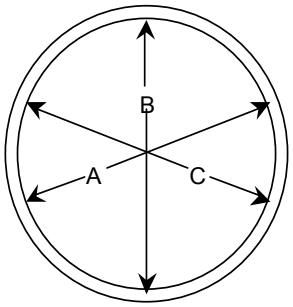
Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _____ Date: _____

As Charted _____ Reviewed By (W) Eng.: _____ Date: _____

CUSTOMER:	American Electric Power
LOCATION/UNIT #:	Mitchell #1 / MLU106
MAIN OIL PUMP OIL SEAL RING CLRS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:





OIL SEAL

5.498

				Diametrical Clearance				
SEAL NO.	Groove Width	Ring thickness	Axial Clrs	A	B	C	SHAFT DIA.	MAX. CLR
1	0.630	0.623	0.007	5.498	5.498	5.498	5.495	0.003
2	0.630	0.623	0.007	9.208	9.205	9.208	9.202	0.005
3	0.629	0.623	0.006	9.210	9.206	9.210	9.202	0.006
4	0.634	0.623	0.011	5.500	5.499	5.500	5.495	0.005

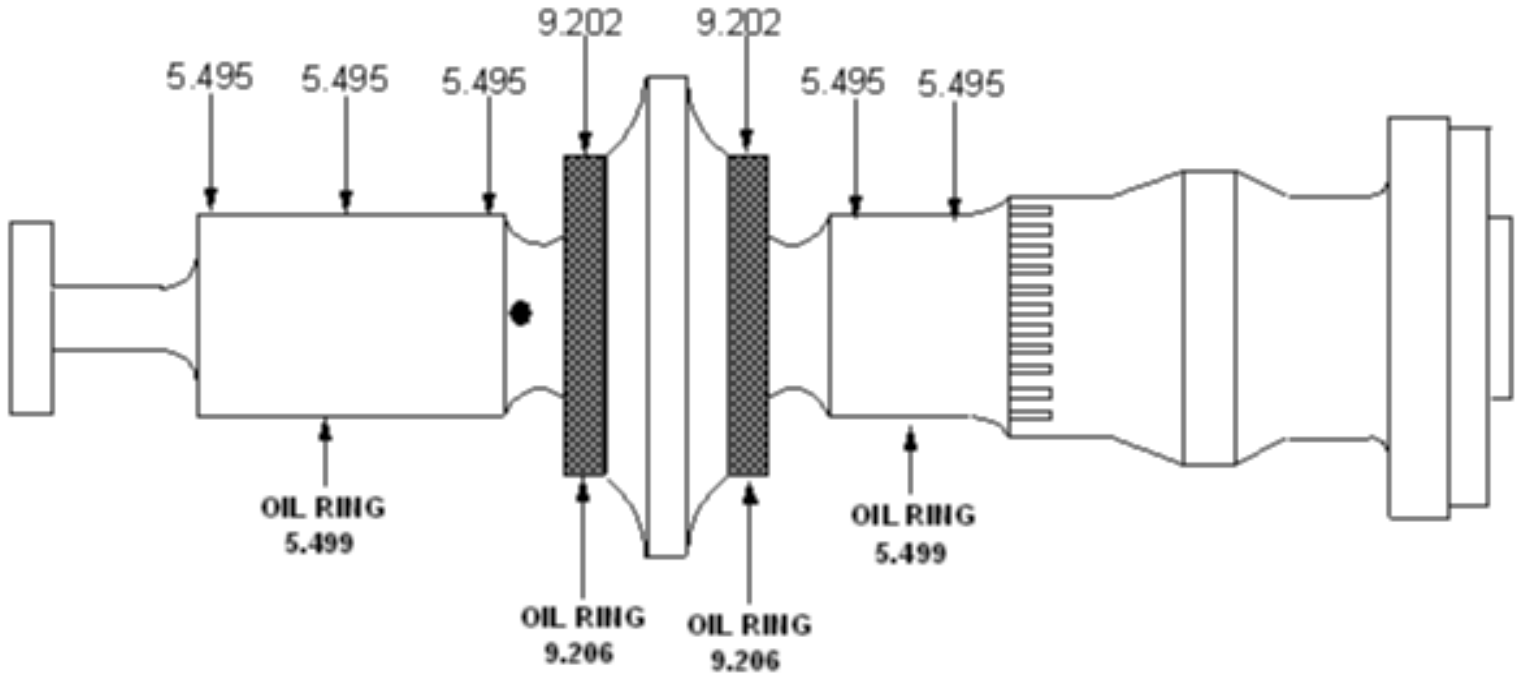
Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _____ Date: _____

As Assembled ____x_____ Reviewed By (W) Eng.: _____ Date: _____

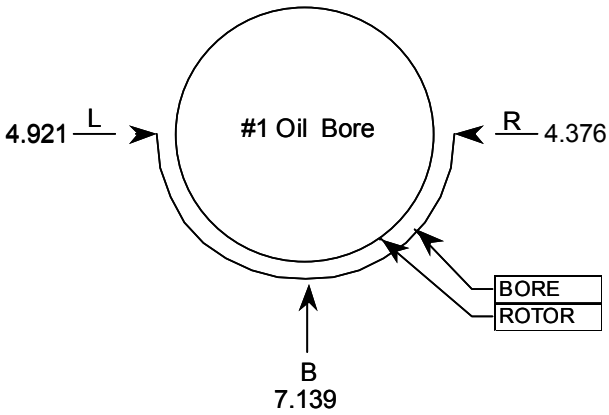
MITCHELL UNIT 1 CONTROL ROTOR

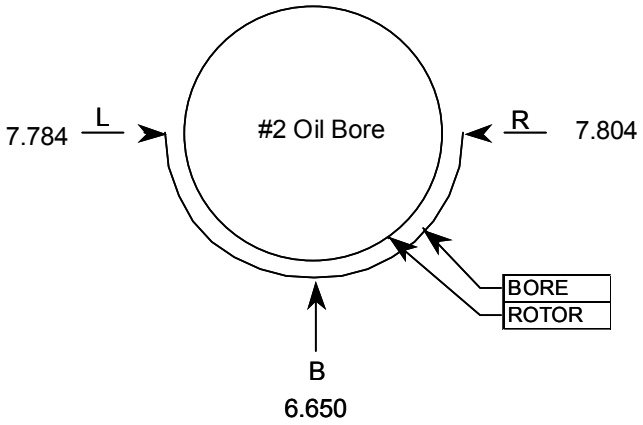
FINAL DIAMETERS



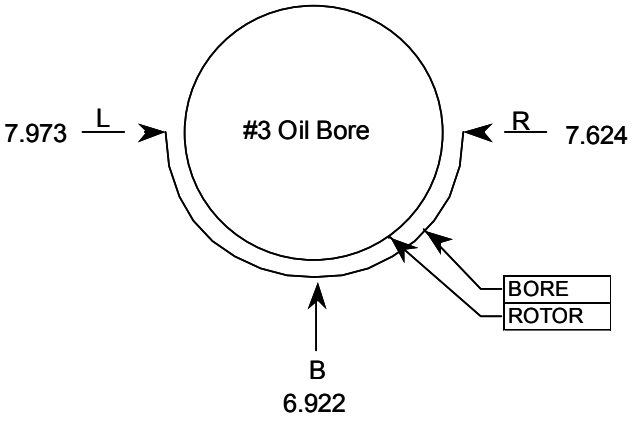
DATE: May 4, 2006
RECORDED BY: Ron Taylor

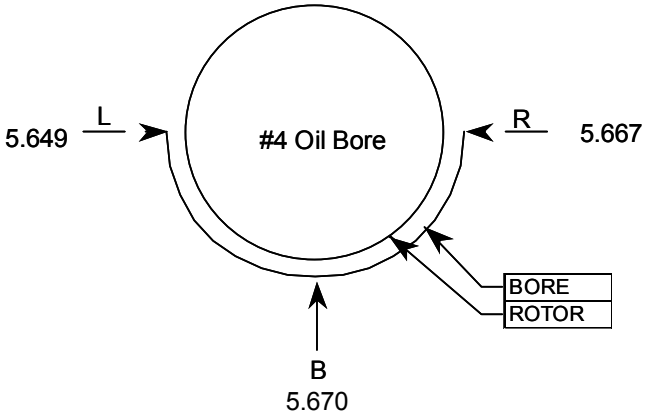
American Electric Power	
Mitchell Station Unit #1	
Oil Deflector Bore Readings	
Ohio Power Company	5-29-2006





I



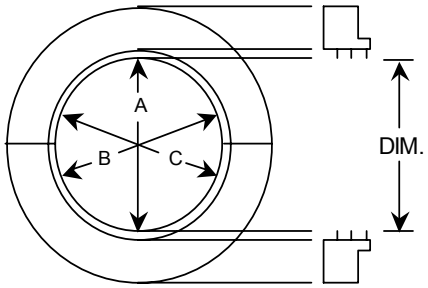


Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _____ Date: _____

As Charted _____ Reviewed By (W) Eng.: _____ Date: _____

CUSTOMER:	*American Electric Power / Ohio Power Company*
LOCATION/UNIT #:	*Mitchell Unit #1 MLU106*
OIL SEAL RING AND SHAFT DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:



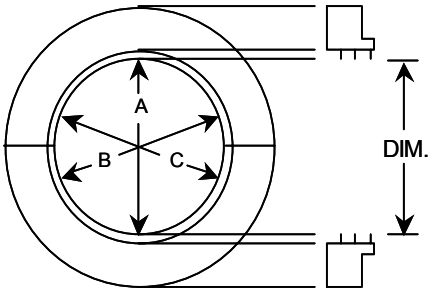
SEAL NO.	LOCATION	A	B	C	AVG SEAL I.D.	ROTOR O.D.	AVE Clearance	Min / Max	Design Clearance
T-1		*15.518*	*15.496*	*15.501*	*15.505*	*15.455*	*0.050*	*54/59*	*0.031*
T-3		*15.468*	*15.463*	*15.468*	*15.466*	*15.448*	*0.018*	*15/20*	*0.031*
T-4		*17.463*	*17.461*	*17.466*	*17.463*	*17.445*	*0.018*	*16/21*	*0.035*
T-11 GVN		*9.976*	*9.976*	*9.976*	*9.976*	*9.958*	*0.018*	*18/18*	*0.020*
T-11 GNN		*9.976*	*9.976*	*9.975*	*9.976*	*9.958*	*0.018*	*17/18*	*0.020*

Tool # Used _____ Cal. Due Date ___

As Found _____ Reading Taken By: _____ Date: _____

As Charted _____ Reviewed By Turb Coord.: _____ Date: _____

CUSTOMER:	*American Electric Power / Ohio Power Company*
LOCATION/UNIT #:	*Mitchell Unit #1 MLU106*
Tilting Pad Bearing Flood Ring Dimensions	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:



SEAL NO.	LOCATION	A	B	C	AVG SEAL I.D.	ROTOR O.D.	AVE Clearance	Min / Max	Design Clearance
T-3									
GVN		*13.987*	*13.992*	*13.992*	*13.990*	*13.959*	*0.031*	*28/33*	*0.028*
GNN		*13.987*	*13.991*	*13.991*	*13.990*	*13.959*	*0.031*	*28/32*	*0.028*
T-4									
GVN		*15.991*	*15.991*	*15.991*	*15.991*	*15.958*	*0.033*	*33/33*	*0.032*
GNN		*15.992*	*15.991*	*15.991*	*15.991*	*15.958*	*0.033*	*32/33*	*0.032*
T-11									
GVN		*9.014*	*9.012*	*9.012*	*9.012*	*9.000*	*0.012*	*12/14*	*0.018*
GNN		*9.013*	*9.011*	*9.013*	*9.012*	*9.000*	*0.012*	*11/13*	*0.018*

Tool # Used _____ Cal. Due Date ___

As Found _____ Reading Taken By: _____ Date: _____

As Charted _____ Reviewed By Turb Coord.: _____ Date: _____

Coupling Alignment

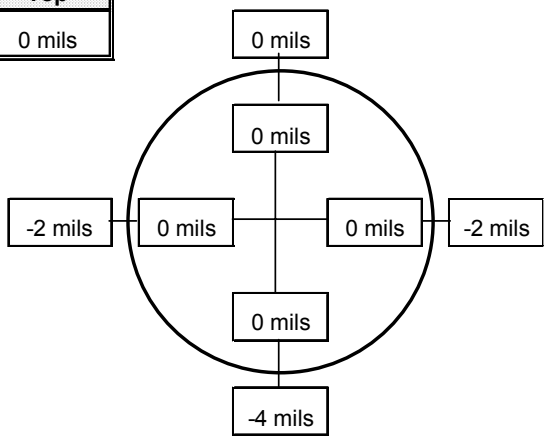
Final ***"A" Coupling***

Date	06/01/06	Turbine Serial No.	MLU106	Prepared by	Moore/Hennnen
Coupling	"A"	Sweep Diameter	32"	Indicator Mounted on	IP

Alignment Readings

Position	Top	Left	Bottom	Right	Top
Rim (Mils)	0 mils	-2 mils	-4 mils	-2 mils	0 mils
Face 0º	1.275"	1.273"	1.274"	1.273"	
Face 90º	1.271"	1.273"	1.273"	1.272"	
Face 180º	1.272"	1.272"	1.272"	1.273"	
Face 270º	1.269"	1.270"	1.269"	1.270"	
Average	1.272"	1.272"	1.272"	1.272"	
Relative	0 mils	0 mils	0 mils	0 mils	

Check	Face	Rim
Top + Bottom=	0 mils	-4 mils
Right + Left =	0 mils	-4 mils
Difference=	0 mils	0 mils



Rim Recheck (If Necessary)

Position	Top	Right	Bottom	Left	Top
Rim (Mils)					

Comments:	
Desired Alignment: Rims concentric, faces parallel. Face readings taken on Male rabbet faces	

Coupling Bolt Assembly Data

Date: 4/18/2006 Turbine Serial No. MLU106 Prepared by Rahn

COUPLING "A"

STUD	COUPLING HOLE DIAMETER			STUD DIAMETER		CLEARANCE		
HOLE	TB. SIDE	SPACER	GEN. SIDE	TB. SIDE	GEN. SIDE	TB. SIDE	SPACER	GEN. SIDE
1 (M)	2.126 "	2.128 "	2.126 "	2.123 "	2.123 "	0.003 "	0.005 "	0.003 "
2	2.126 "	2.130 "	2.126 "	2.124 "	2.124 "	0.002 "	0.006 "	0.002 "
3	2.126 "	2.128 "	2.126 "	2.122 "	2.122 "	0.004 "	0.006 "	0.004 "
4	2.127 "	2.129 "	2.126 "	2.123 "	2.123 "	0.004 "	0.006 "	0.003 "
5	2.126 "	2.130 "	2.126 "	2.123 "	2.123 "	0.003 "	0.007 "	0.003 "
6	2.125 "	2.131 "	2.126 "	2.123 "	2.123 "	0.002 "	0.008 "	0.003 "
7	2.126 "	2.130 "	2.126 "	2.123 "	2.123 "	0.003 "	0.007 "	0.003 "
8	2.126 "	2.132 "	2.131 "	2.123 "	2.123 "	0.003 "	0.009 "	0.008 "
9	2.127 "	2.129 "	2.131 "	2.123 "	2.123 "	0.004 "	0.006 "	0.008 "
10	2.126 "	2.131 "	2.127 "	2.123 "	2.123 "	0.003 "	0.008 "	0.004 "
11	2.127 "	2.130 "	2.127 "	2.123 "	2.123 "	0.004 "	0.007 "	0.004 "
12	2.127 "	2.131 "	2.127 "	2.123 "	2.123 "	0.004 "	0.008 "	0.004 "
13	2.126 "	2.130 "	2.128 "	2.122 "	2.122 "	0.004 "	0.008 "	0.006 "
14	2.127 "	2.129 "	2.126 "	2.124 "	2.124 "	0.003 "	0.005 "	0.002 "
15	2.127 "	2.129 "	2.126 "	2.124 "	2.124 "	0.003 "	0.005 "	0.002 "
16	2.126 "	2.129 "	2.126 "	2.123 "	2.123 "	0.003 "	0.006 "	0.003 "

Comments:

The "M" mark on the gov end of the IP is at the #7 bolt hole location.

Coupling Assembly Checks

With Integral Rabbets

Date(m,d,y) 6/3/2006 Turbine Serial No. MLU106 Prepared by Rahn

Coupling A

Data Final
(as found/final)

NOTES:
(1) For radial runout set indicator to read "0" at the number 1 position.
(2) Mark positions 1-8 to agree with factory stamped degree marks on rotor as shown on Fig. 1.

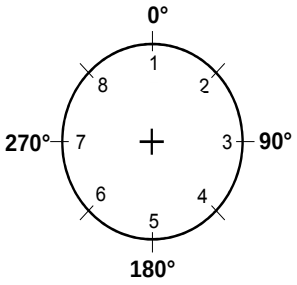


Fig. 1

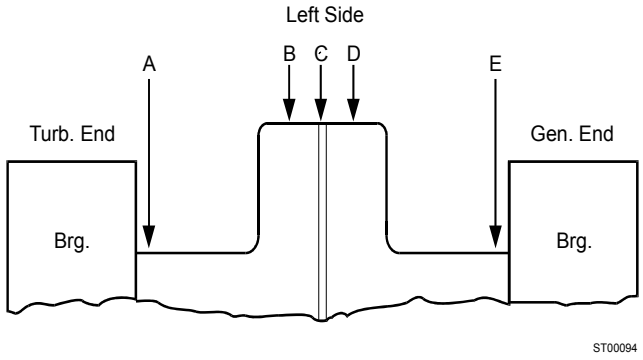


Fig. 2

Coupling Runouts (Readings are in Mils)

Area Indicated		Position Number 1 0°	2 45°	3 90°	4 135°	5 180°	6 225°	7 270°	8 315°	1 0°
TE Journal	A	0.0	0.0	-0.5	-0.5	0.0	0.0	0.0	0.5	0.0
TE Cplg. Periphery B	B	0.0	-0.5	-0.5	0.0	0.0	1.0	1.0	1.0	0.0
Spacer	C	0.0	-1.0	0.0	0.0	1.0	1.0	2.0	1.5	0.0
GE Cplg. Periphery D	D	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0	0.0
GE Journal	E	0.0	0.0	0.0	0.0	0.0	-1.0	0.0	0.0	0.0

Differential Runouts

Journals	A-E	0.0	0.0	0.5	0.5	0.0	1.0	0.0	0.5	0.0
Cplg. Periphery	B-D	0.0	0.5	0.5	0.0	0.0	2.0	1.0	1.0	0.0
Spacer to Cplg	C-B	0.0	0.5	0.5	0.0	1.0	0.0	1.0	0.5	0.0
Spacer to Cplg	C-D	0.0	1.0	0.0	0.0	1.0	2.0	2.0	1.5	0.0

Maximum Runouts

Area Indicated		Data Check	TIR Runout	TIR Check
TE Journal	A	OK	1.0	OK
TE Cplg. Periphery B	B	OK	1.5	OK
Spacer	C	OK	3.0	OK
GE Cplg. Periphery D	D	OK	1.0	OK
GE Journal	E	OK	1.0	OK

Maximum Differential Runouts

		Max. Diff.	Diff. Check
Journals	A-E	1.0	OK
Cplg. Periphery	B-D	2.0	Check
Spacer to Cplg	C-B	1.0	OK
Spacer to Cplg	C-D	2.0	OK

Coupling Bolt Assembly Data

Date: 4/20/2006 Turbine Serial No. MLU106 Prepared by

COUPLING "B"

STUD	COUPLING HOLE DIAMETER			STUD DIAMETER		CLEARANCE		
HOLE	TB. SIDE	SPACER	GEN. SIDE	TB. SIDE	GEN. SIDE	TB. SIDE	SPACER	GEN. SIDE
1 (M)	2.128 "	x	2.126 "	2.123 "	2.123 "	0.005 "	x	0.003 "
2	2.128 "	x	2.126 "	2.121 "	2.121 "	0.007 "	x	0.005 "
3	2.127 "	x	2.126 "	2.122 "	2.122 "	0.005 "	x	0.004 "
4	2.127 "	x	2.127 "	2.120 "	2.120 "	0.007 "	x	0.007 "
5	2.127 "	x	2.125 "	2.123 "	2.123 "	0.004 "	x	0.002 "
6	2.127 "	x	2.125 "	2.123 "	2.123 "	0.004 "	x	0.002 "
7	2.130 "	x	2.126 "	2.122 "	2.122 "	0.008 "	x	0.004 "
8	2.129 "	x	2.126 "	2.123 "	2.123 "	0.006 "	x	0.003 "
9	2.127 "	x	2.126 "	2.123 "	2.123 "	0.004 "	x	0.003 "
10	2.128 "	x	2.126 "	2.122 "	2.122 "	0.006 "	x	0.004 "
11	2.129 "	x	2.126 "	2.123 "	2.123 "	0.006 "	x	0.003 "
12	2.128 "	x	2.126 "	2.123 "	2.123 "	0.005 "	x	0.003 "
13	2.130 "	x	2.126 "	2.123 "	2.123 "	0.007 "	x	0.003 "
14	2.130 "	x	2.126 "	2.123 "	2.123 "	0.007 "	x	0.003 "
15	2.127 "	x	2.126 "	2.122 "	2.122 "	0.005 "	x	0.004 "
16	2.127 "	x	2.126 "	2.123 "	2.123 "	0.004 "	x	0.003 "

Comments:

Coupling Assembly Checks

With Integral Rabbets

Date(m,d,y) 6/1/2006 Turbine Serial No. MLU106 Prepared by Courtright

Coupling B

Data Final
(as found/final)

NOTES:
(1) For radial runout set indicator to read "0" at the number 1 position.
(2) Mark positions 1-8 to agree with factory stamped degree marks on rotor as shown on Fig. 1.

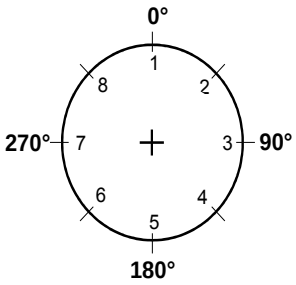


Fig. 1

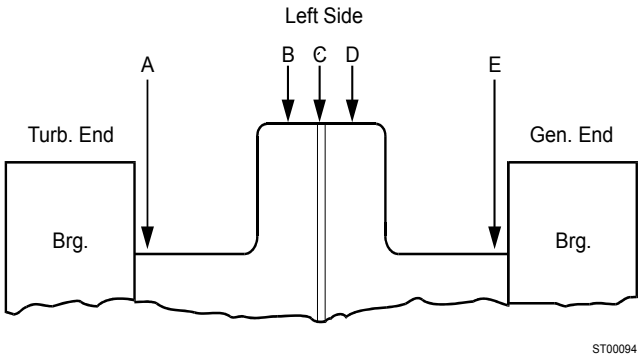


Fig. 2

Coupling Runouts (Readings are in Mils)

Area Indicated		Position Number 1 0°	2 45°	3 90°	4 135°	5 180°	6 225°	7 270°	8 315°	1 0°
TE Journal	A	0.0	0.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0
TE Cplg. Periphery B	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0
Spacer	C									
GE Cplg. Periphery D	D	0.0	0.0	0.0	-1.0	-1.0	-1.0	-1.0	-0.5	-0.5
GE Journal	E	0.0	0.0	2.0	1.0	0.0	0.0	-1.0	-0.5	0.0

Differential Runouts

Journals	A-E	0.0	0.0	1.0	1.0	1.0	1.0	1.0	0.5	0.0
Cplg. Periphery	B-D	0.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0	0.5
Spacer to Cplg	C-B									
Spacer to Cplg	C-D	0.0	0.0	0.0	1.0	1.0	1.0	1.0	0.5	0.5

Maximum Runouts

Area Indicated		Data Check	TIR Runout	TIR Check
TE Journal	A	OK	1.0	OK
TE Cplg. Periphery B	B	OK	0.5	OK
Spacer	C			
GE Cplg. Periphery D	D	Check	1.0	OK
GE Journal	E	OK	3.0	Check

Maximum Differential Runouts

		Max. Diff.	Diff. Check
Journals	A-E	1.0	OK
Cplg. Periphery	B-D	1.0	OK
Spacer to Cplg	C-B		
Spacer to Cplg	C-D	1.0	OK

Coupling Alignment

"C" Coupling

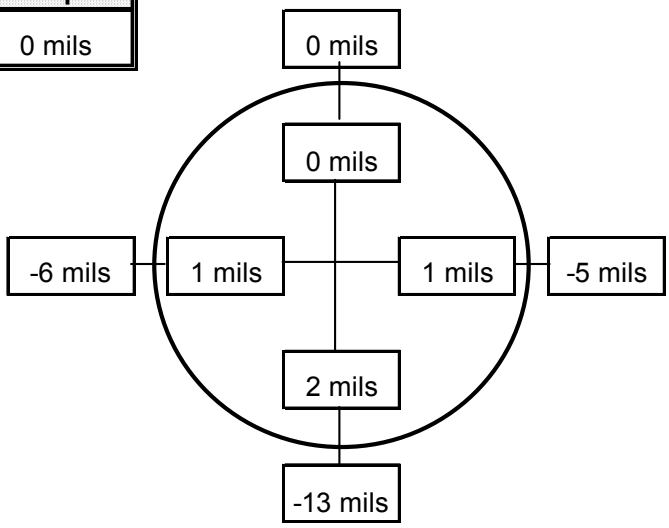
Date 05/28/06 Turbine Serial No. MLU106 Prepared by Vickers

Coupling "C" Sweep Diameter Indicator Mounted on IP

Alignment Readings

Position	Top	Left	Bottom	Right	Top
Rim (Mils)	0 mils	-6 mils	-13 mils	-5 mils	0 mils
Face 0º	1.042"	1.042"	1.043"	1.043"	
Face 90º	1.046"	1.045"	1.047"	1.047"	
Face 180º	1.046"	1.049"	1.051"	1.048"	
Face 270º	1.051"	1.052"	1.052"	1.051"	
Average	1.046"	1.047"	1.048"	1.047"	
Relative	0 mils	1 mils	2 mils	1 mils	

Check	Face	Rim
Top + Bottom=	2 mils	-13 mils
Right + Left =	2 mils	-11 mils
Difference=	0 mils	-2 mils



Rim Recheck (If Necessary)

Position	Top	Right	Bottom	Left	Top
Rim (Mils)					

Comments:
Desired Alignment: IP .007" low to LP centerline, face open .004" on bottom. Face readings taking inside coupling bolt diameter

Coupling Bolt Assembly Data

Date: 4/20/2006 Turbine Serial No. MLU106 Prepared by

COUPLING "C"

STUD	COUPLING HOLE DIAMETER			STUD DIAMETER		CLEARANCE		
HOLE	TB. SIDE	SPACER	GEN. SIDE	TB. SIDE	GEN. SIDE	TB. SIDE	SPACER	GEN. SIDE
1 (M)	2.313 "	2.316 "	2.316 "	2.310 "	2.310 "	0.003 "	0.006 "	0.006 "
2	2.313 "	2.316 "	2.313 "	2.310 "	2.310 "	0.003 "	0.006 "	0.003 "
3	2.313 "	2.316 "	2.313 "	2.309 "	2.309 "	0.004 "	0.007 "	0.004 "
4	2.313 "	2.316 "	2.313 "	2.310 "	2.310 "	0.003 "	0.006 "	0.003 "
5	2.314 "	2.315 "	2.313 "	2.310 "	2.310 "	0.004 "	0.005 "	0.003 "
6	2.314 "	2.316 "	2.311 "	2.310 "	2.310 "	0.004 "	0.006 "	0.001 "
7	2.314 "	2.316 "	2.312 "	2.310 "	2.310 "	0.004 "	0.006 "	0.002 "
8	2.313 "	2.316 "	2.314 "	2.310 "	2.310 "	0.003 "	0.006 "	0.004 "
9	2.313 "	2.316 "	2.314 "	2.310 "	2.310 "	0.003 "	0.006 "	0.004 "
10	2.314 "	2.316 "	2.312 "	2.310 "	2.310 "	0.004 "	0.006 "	0.002 "
11	2.313 "	2.315 "	2.314 "	2.310 "	2.310 "	0.003 "	0.005 "	0.004 "
12	2.314 "	2.315 "	2.311 "	2.310 "	2.310 "	0.004 "	0.005 "	0.001 "
13	2.313 "	2.315 "	2.316 "	2.310 "	2.310 "	0.003 "	0.005 "	0.006 "
14	2.314 "	2.315 "	2.313 "	2.310 "	2.310 "	0.004 "	0.005 "	0.003 "
15	2.314 "	2.316 "	2.314 "	2.310 "	2.310 "	0.004 "	0.006 "	0.004 "
16	2.314 "	2.316 "	2.312 "	2.309 "	2.309 "	0.005 "	0.007 "	0.003 "
17	2.314 "	2.316 "	2.314 "	2.310 "	2.310 "	0.004 "	0.006 "	0.004 "
18	2.314 "	2.316 "	2.313 "	2.310 "	2.310 "	0.004 "	0.006 "	0.003 "
19	2.313 "	2.316 "	2.314 "	2.310 "	2.310 "	0.003 "	0.006 "	0.004 "
20	2.313 "	2.316 "	2.313 "	2.307 "	2.307 "	0.006 "	0.009 "	0.006 "

Comments:

Coupling Assembly Checks

With Integral Rabbets

Date(m,d,y) 6/1/2006 Turbine Serial No. MLU106 Prepared by Courtright

Coupling C

Data Final
(as found/final)

NOTES:
(1) For radial runout set indicator to read "0" at the number 1 position.
(2) Mark positions 1-8 to agree with factory stamped degree marks on rotor as shown on Fig. 1.

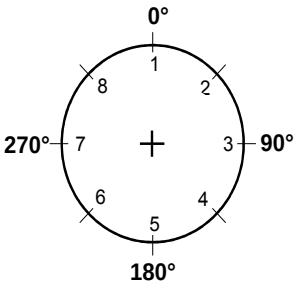


Fig. 1

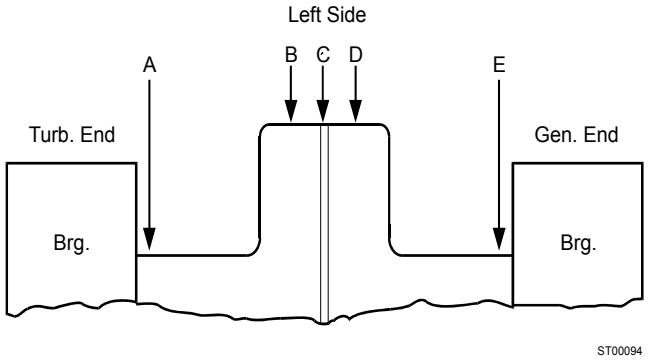


Fig. 2

Coupling Runouts (Readings are in Mils)

Area Indicated		Position Number 1 0°	2 45°	3 90°	4 135°	5 180°	6 225°	7 270°	8 315°	1 0°
TE Journal	A	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0
TE Cplg. Periphery B	B	0.0	0.0	0.0	-2.0	-4.0	-4.0	-3.5	-1.5	0.0
Spacer	C	0.0	1.0	2.0	-1.0	-2.0	-4.0	-4.0	-2.0	0.0
GE Cplg. Periphery D	D	0.0	1.0	2.5	0.0	-1.0	-2.5	-2.5	-1.5	0.0
GE Journal	E	0.0	1.0	2.0	1.5	1.0	0.0	-0.5	-0.5	0.0

Differential Runouts

Journals	A-E	0.0	1.0	2.0	1.5	0.0	1.0	1.0	0.5	0.0
Cplg. Periphery	B-D	0.0	1.0	2.5	2.0	3.0	1.5	1.0	0.0	0.0
Spacer to Cplg	C-B	0.0	1.0	2.0	1.0	2.0	0.0	0.5	0.5	0.0
Spacer to Cplg	C-D	0.0	0.0	0.5	1.0	1.0	1.5	1.5	0.5	0.0

Maximum Runouts

Area Indicated		Data Check	TIR Runout	TIR Check
TE Journal	A	OK	1.0	OK
TE Cplg. Periphery B	B	OK	4.0	Check
Spacer	C	OK	6.0	Check
GE Cplg. Periphery D	D	OK	5.0	Check
GE Journal	E	OK	2.5	Check

Maximum Differential Runouts

		Max. Diff.	Diff. Check
Journals	A-E	2.0	Check
Cplg. Periphery	B-D	3.0	Check
Spacer to Cplg	C-B	2.0	OK
Spacer to Cplg	C-D	1.5	OK

Coupling Inspection

Date(m/d/y) _____ Turbine Serial No. 13A3161-1 Prepared by Unger

Rotor Identification _____ Coupling Spacers

(Turbine End or Generator End)

INSPECTIONS & CHECKS				CODE	
				X	Work Carried Out
Bolt Covers & Screws		Coupling Runouts		**N**	Not Done
Lockplates		Bolt Extension Measurements		**NA**	Not Applicable
Coupling Bolts/Studs				**C**	See Comments
Coupling Mating Surface				**V**	Visual Inspection
Rabbet				**MP**	Mag. Particle
Dimensional Checks				**UT**	Ultrasonic
Coupling Flatness				**PT**	Penetrant

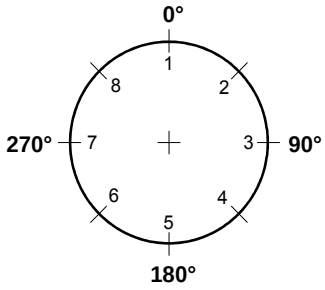


Fig. 1

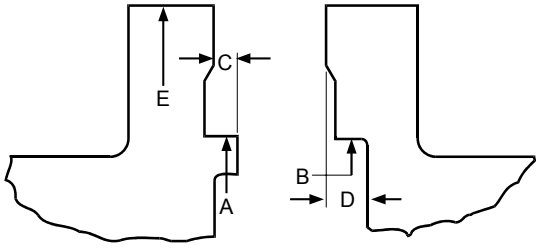


Fig. 2

ST00100a

NOTES:

COUPLING DIMENSIONAL CHECKS Readings in Inches

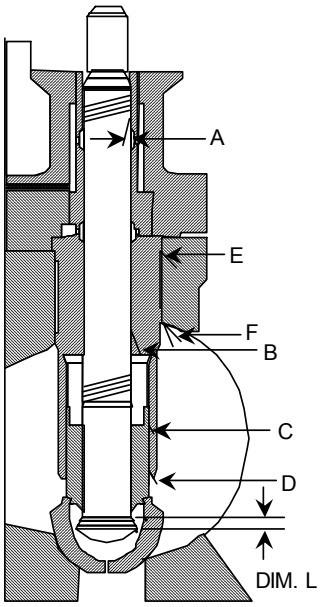
		Position Number					
		1	2	3	4		
	Location	0°	45°	90°	135°	Male Fit	Clrc
1.403" tk	GVN "A" Spacer (B)	20.001	20.001	20.001	20.001	20.000	0.001
1.403" tk	GNN "A" Spacer (B)	19.997	19.997	19.997	19.997	19.996	0.001
1.211" tk	GNN "C" Spacer (B)	22.001	22.001	22.001	22.001	22.000	0.001
1.211" tk	GNN "C" Spacer (B)	21.996	21.996	21.996	21.996	21.995	0.001

Measurements after from CMS to size Female Fits

Comments:

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___1_____



New Disc & Nut

NO. _1__ VALVE DATA (AS FOUND)				Design Clear.	Service allowed	NO. __1_ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR			DIM.	O.D.	I.D.	CLR
A	1.736	1.752	0.016	.010/.012	.009/.018	A	1.736	1.752	0.016
B	1.736	1.751	0.015	.010/.012	.009/.018	B	1.736	1.751	0.015
C	4.174	4.183	0.009	.010/.012	.009/.018	C	4.174	4.183	0.009
D	4.168	4.186	0.018	.010/.012	.009/.018	D	4.175	4.185	0.010
E	5.580	5.583	0.003	.001/.003	.001/.015	E	5.577	5.583	0.006
F	5.579	5.593	0.014	.001/.003	.001/.015	F	5.572	5.593	0.021
STEM RUNOUT =		0.001		.001/.003	.004	STEM RUNOUT =		0.001	
DIMENSION L =		0.176		.115/.135	.115/.135	DIMENSION L =		0.134	

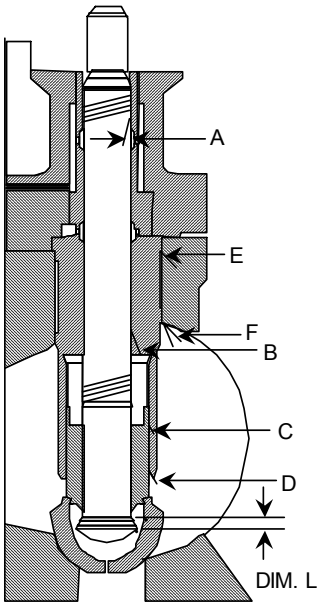
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___2_____



NO. _2__ VALVE DATA (AS FOUND)				Design Clear.	Service allowed	NO. _2__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR			DIM.	O.D.	I.D.	CLR
A	1.738	1.755	0.017	.010/.012	.009/.018	A	1.738	1.755	0.017
B	1.739	1.749	0.01	.010/.012	.009/.018	B	1.739	1.750	0.011
C	4.177	4.185	0.008	.010/.012	.009/.018	C	4.177	4.185	0.008
D	4.177	4.186	0.009	.010/.012	.009/.018	D	4.177	4.186	0.009
E	5.790			.001/.003	.001/.015	E	5.576	5.589	0.013
F	5.578			.001/.003	.001/.015	F	5.574	5.597	0.023
STEM RUNOUT =		0.002		.001/.003	.004	STEM RUNOUT =		0.002	
DIMENSION L =		0.183		.115/.135	.115/.135	DIMENSION L =		0.183	

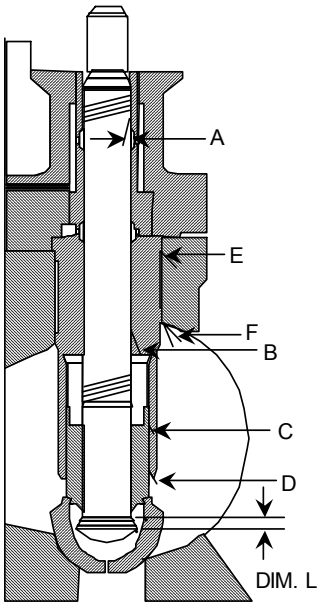
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___3_____



New Stem, Plug & Nut

NO. _3__ VALVE DATA (AS FOUND)						NO. _3__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR	Design Clear.	Service allowed	DIM.	O.D.	I.D.	CLR
A	1.738	1.751	0.013	.010/.012	.009/.018	A	1.737	1.751	0.014
B	1.734	1.750	0.016	.010/.012	.009/.018	B	1.737	1.750	0.013
C	4.173	4.184	0.011	.010/.012	.009/.018	C	4.174	4.184	0.010
D	4.169	4.187	0.018	.010/.012	.009/.018	D	4.174	4.188	0.014
E	5.583	5.586	0.003	.001/.003	.001/.015	E	5.576	5.586	0.010
F	5.583	5.586	0.003	.001/.003	.001/.015	F	5.577	5.595	0.018
STEM RUNOUT =		0.002		.001/.003	.004	STEM RUNOUT =		0.001	
DIMENSION L =		0.218		.115/.135	.115/.135	DIMENSION L =		0.172	

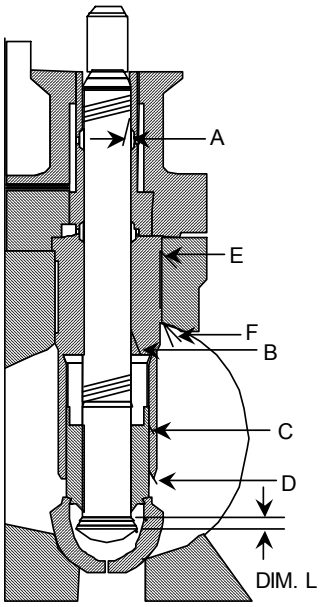
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___4_____



NO. _4__ VALVE DATA (AS FOUND)						NO. _4__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR	Design Clear.	Service allowed	DIM.	O.D.	I.D.	CLR
A	1.735	1.768	0.033	.010/.012	.009/.018	A	1.735	1.768	0.033
B	1.736	1.710	-0.026	.010/.012	.009/.018	B	1.736	1.752	0.016
C	4.173	4.185	0.012	.010/.012	.009/.018	C	4.173	4.190	0.017
D	4.170	4.187	0.017	.010/.012	.009/.018	D	4.170	4.191	0.021
E	5.566			.001/.003	.001/.015	E	5.573	5.577	0.004
F	5.545			.001/.003	.001/.015	F	5.570	5.593	0.023
STEM RUNOUT =		0.000		.001/.003	.004	STEM RUNOUT =		0.000	
DIMENSION L =		0.180		.115/.135	.115/.135	DIMENSION L =		0.172	

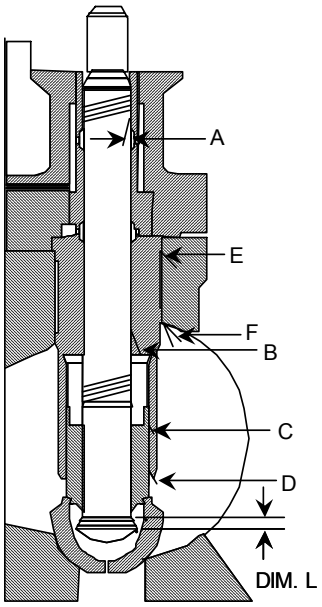
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___5_____



NO. _5__ VALVE DATA (AS FOUND)						NO. _5__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR	Design Clear.	Service allowed	DIM.	O.D.	I.D.	CLR
A	1.737	1.752	0.015	.010/.012	.009/.018	A	1.737	1.752	0.015
B	1.737	1.751	0.014	.010/.012	.009/.018	B	1.737	1.751	0.014
C	4.175	4.183	0.008	.010/.012	.009/.018	C	4.175	4.183	0.008
D	4.171	4.185	0.014	.010/.012	.009/.018	D	4.171	4.185	0.014
E	5.582	5.589	0.007	.001/.003	.001/.015	E	5.580	5.589	0.009
F	5.582	5.603	0.021	.001/.003	.001/.015	F	5.577	5.603	0.026
STEM RUNOUT =		0.000		.001/.003	.004	STEM RUNOUT =		0.000	
DIMENSION L =		0.162		.115/.135	.115/.135	DIMENSION L =		0.162	

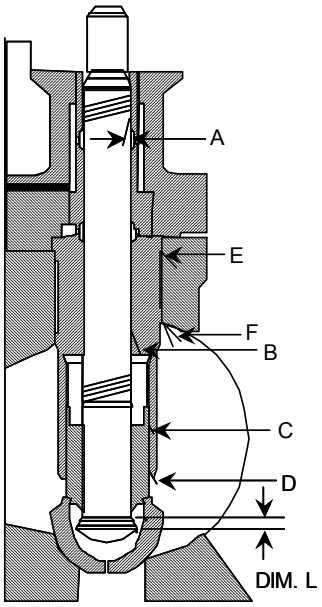
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___6_____



NO. _6__ VALVE DATA (AS FOUND)						NO. _6__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR	Design Clear.	Service allowed	DIM.	O.D.	I.D.	CLR
A				.010/.012	.009/.018	A	1.737	1.752	0.015
B				.010/.012	.009/.018	B	1.737	1.753	0.016
C				.010/.012	.009/.018	C	4.175	4.184	0.009
D				.010/.012	.009/.018	D	4.175	4.187	0.012
E				.001/.003	.001/.015	E	5.578	5.585	0.007
F				.001/.003	.001/.015	F	5.579	5.596	0.017
STEM RUNOUT =				.001/.003	.004	STEM RUNOUT =		0.002	
DIMENSION L =				.115/.135	.115/.135	DIMENSION L =		0.143	

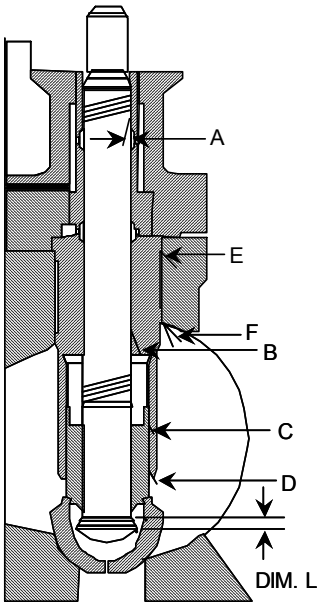
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___7_____



New Stem, Plug & Nut

NO. _7__ VALVE DATA (AS FOUND)						NO. _7__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR	Design Clear.	Service allowed	DIM.	O.D.	I.D.	CLR
A		1.755		.010/.012	.009/.018	A	1.738	1.755	0.017
B		1.752		.010/.012	.009/.018	B	1.738	1.752	0.014
C		4.186		.010/.012	.009/.018	C	4.172	4.186	0.014
D		4.187		.010/.012	.009/.018	D	4.172	4.187	0.015
E	5.585	5.588	0.003	.001/.003	.001/.015	E	5.580	5.588	0.008
F	5.583	5.607	0.024	.001/.003	.001/.015	F	5.580	5.607	0.027
STEM RUNOUT =				.001/.003	.004	STEM RUNOUT =		0.002	
DIMENSION L =				.115/.135	.115/.135	DIMENSION L =		0.142	

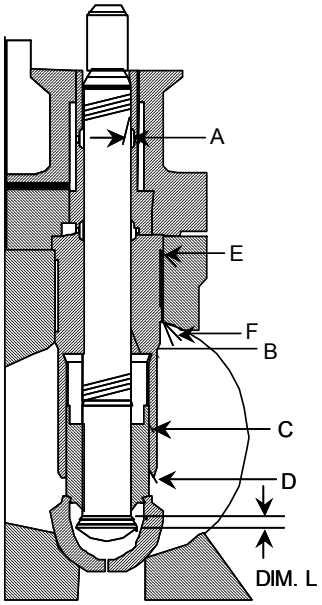
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER:	AEP
LOCATION/UNIT #:	
GOVERNOR VALVE DIMENSIONS	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Valve # ___8_____



NO. _8__ VALVE DATA (AS FOUND)				Design Clear.	Service allowed	NO. _8__ VALVE DATA (AS LEFT)			
DIM.	O.D.	I.D.	CLR			DIM.	O.D.	I.D.	CLR
A	1.737	1.750	0.013	.010/.012	.009/.018	A	1.737	1.750	0.013
B	1.737	1.753	0.016	.010/.012	.009/.018	B	1.737	1.753	0.016
C	4.174	4.185	0.011	.010/.012	.009/.018	C	4.174	4.185	0.011
D	4.172	4.183	0.011	.010/.012	.009/.018	D	4.172	4.183	0.011
E	5.583			.001/.003	.001/.015	E	5.572	5.586	0.014
F	5.584			.001/.003	.001/.015	F	5.576	5.595	0.019
STEM RUNOUT =		0.001		.001/.003	.004	STEM RUNOUT =		0.001	
DIMENSION L =		0.171		.115/.135	.115/.135	DIMENSION L =		0.171	

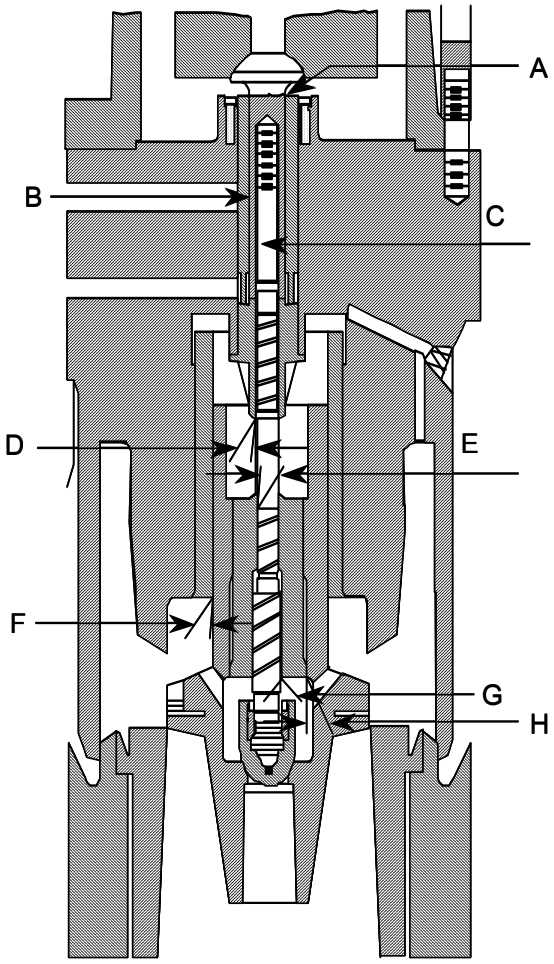
Tool # Used _____ Cal. Due Date _____

As Found _____X_____ Reading Taken By: _Bordenkircher/Messerschmidt_____ Date: _____

As Assembled ____X_____ Reviewed By: __Powell_____ Date: _5/16/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

LOCATION : _____#1_____



As Found Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.111	2.124	0.013	.010/.013
B	2.111	2.125	0.014	.010/.013
C	1.381	1.393	0.012	.005/.007
D	1.487	1.499	0.012	.010/.013
E	1.487	1.498	0.011	.010/.013
F	5.491	5.494	0.003	.011/.017
G	1.930	1.935	0.005	.010/.013
H	3.806	3.808	0.002	.002/.005
I = RUNOUT				0/.003

As Assembled Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.110	2.125	0.015	.010/.013
B	2.110	2.125	0.015	.010/.013
C	1.381	1.392	0.011	.005/.007
D	1.487	1.501	0.014	.010/.013
E	1.487	1.497	0.010	.010/.013
F	5.487	5.497	0.010	.011/.017
G	1.924	1.935	0.011	.010/.013
H	3.805	3.808	0.003	.002/.005
I = RUNOUT				0/.003

Tool # Used _____ Cal. Due Date _____

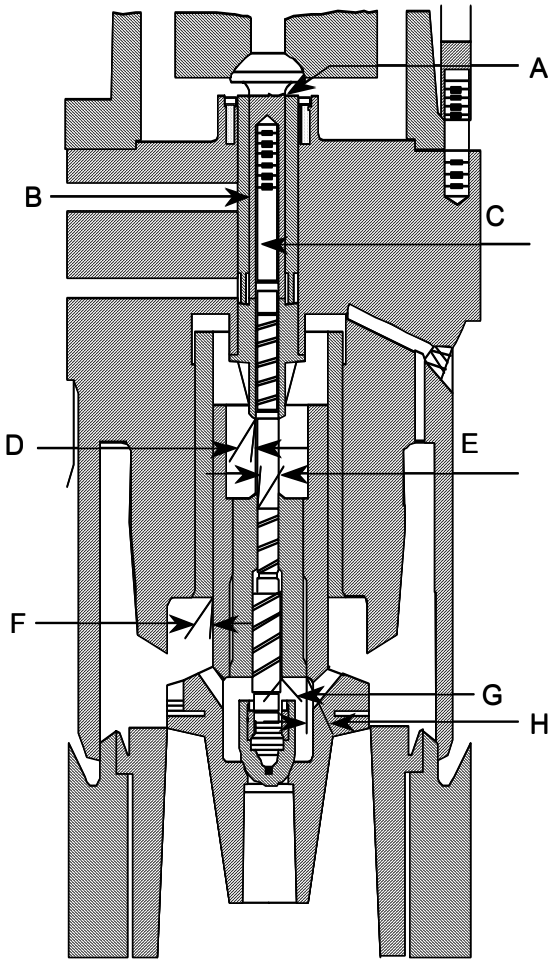
As Found Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/12/06_____

As Assembled Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/24/06_____

Reviewed By Turbine Coordinator: __Powell_____ Date: _5/13/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

LOCATION : _____#2_____



As Found Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.109	2.124	0.015	.010/.013
B	2.110	2.124	0.014	.010/.013
C	1.382	1.391	0.009	.005/.007
D	1.481	1.501	0.020	.010/.013
E	1.482	1.497	0.015	.010/.013
F	5.471	5.486	0.015	.011/.017
G	1.926	1.935	0.009	.010/.013
H	3.803	3.808	0.005	.002/.005
I = RUNOUT				0/.003

As Assembled Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.110	2.124	0.014	.010/.013
B	2.110	2.124	0.014	.010/.013
C	1.381	1.391	0.010	.005/.007
D	1.488	1.501	0.013	.010/.013
E	1.488	1.498	0.010	.010/.013
F	5.482	5.494	0.012	.011/.017
G	1.924	1.934	0.010	.010/.013
H	3.806	3.808	0.002	.002/.005
I = RUNOUT				0/.003

Tool # Used _____ Cal. Due Date _____

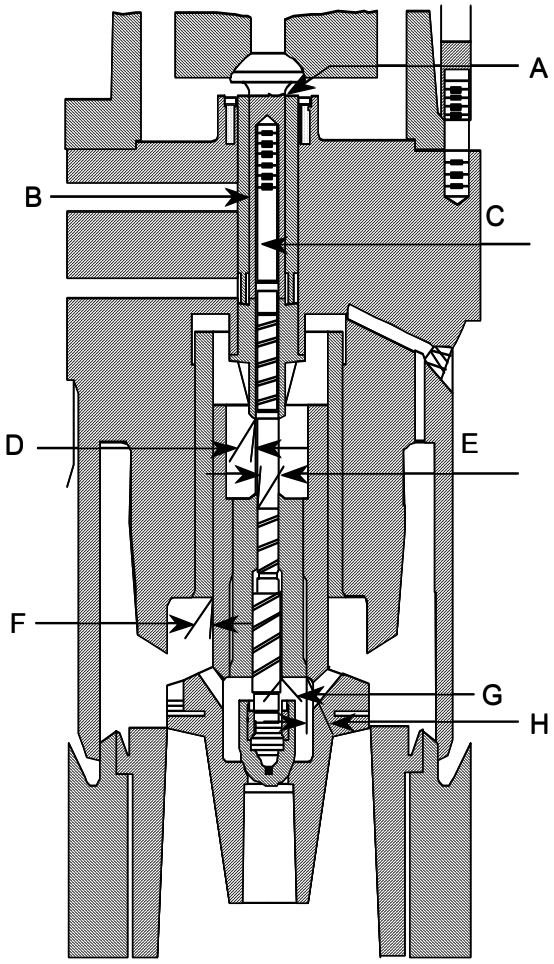
As Found Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/12/06_____

As Assembled Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/24/06_____

Reviewed By Turbine Coordinator: __Powell_____ Date: _5/13/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

LOCATION : _____#3_____



As Found Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.114	2.125	0.011	.010/.013
B	2.115	2.124	0.009	.010/.013
C	1.380	1.387	0.007	.005/.007
D	1.485	1.496	0.011	.010/.013
E	1.486	1.497	0.011	.010/.013
F	5.476	5.490	0.014	.011/.017
G	1.926	1.936	0.010	.010/.013
H	3.806	3.809	0.003	.002/.005
I = RUNOUT				0/.003

As Assembled Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.113	2.125	0.012	.010/.013
B	2.114	2.124	0.010	.010/.013
C	1.380	1.388	0.008	.005/.007
D	1.487	1.496	0.009	.010/.013
E	1.487	1.497	0.010	.010/.013
F	5.470	5.490	0.020	.011/.017
G	1.926	1.936	0.010	.010/.013
H	3.805	3.809	0.004	.002/.005
I = RUNOUT				0/.003

Tool # Used _____ Cal. Due Date _____

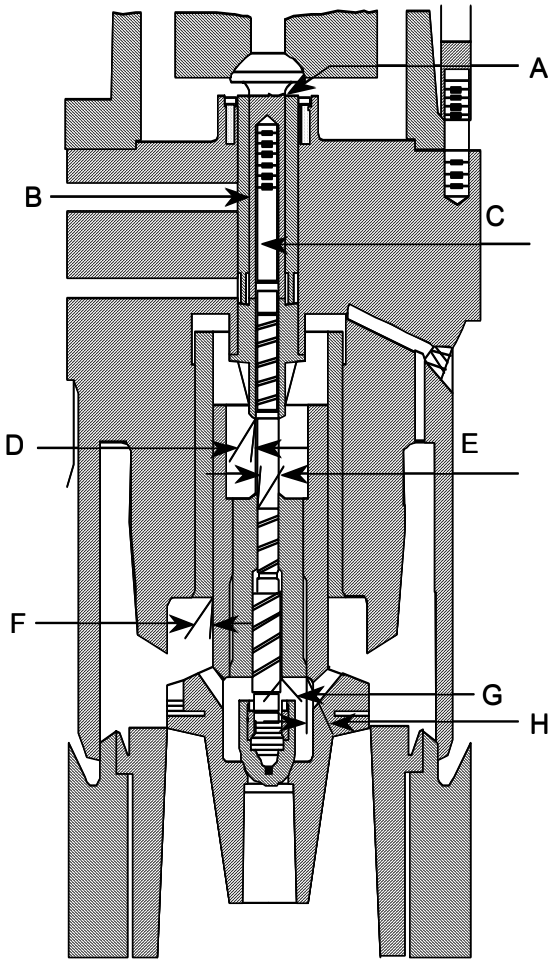
As Found Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/12/06_____

As Assembled Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/24/06_____

Reviewed By Turbine Coordinator: _Powell_____ Date: _5/13/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

LOCATION : _____#4_____



As Found Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.111	2.125	0.014	.010/.013
B	2.111	2.124	0.013	.010/.013
C	1.381	1.393	0.012	.005/.007
D	1.487	1.498	0.011	.010/.013
E	1.488	1.498	0.01	.010/.013
F	5.482	5.489	0.007	.011/.017
G	1.929	1.935	0.006	.010/.013
H	3.802	3.806	0.004	.002/.005
I = RUNOUT				0/.003

As Assembled Throttle Valve Clearances				
DIA	O.D.	I.D.	ACTUAL	DESIGN
A	2.110	2.125	0.015	.010/.013
B	2.110	2.124	0.014	.010/.013
C	1.382	1.387	0.005	.005/.007
D	1.487	1.498	0.011	.010/.013
E	1.488	1.498	0.010	.010/.013
F	5.486	5.497	0.011	.011/.017
G	1.924	1.935	0.011	.010/.013
H	3.808	3.809	0.001	.002/.005
I = RUNOUT				0/.003

Tool # Used _____ Cal. Due Date _____

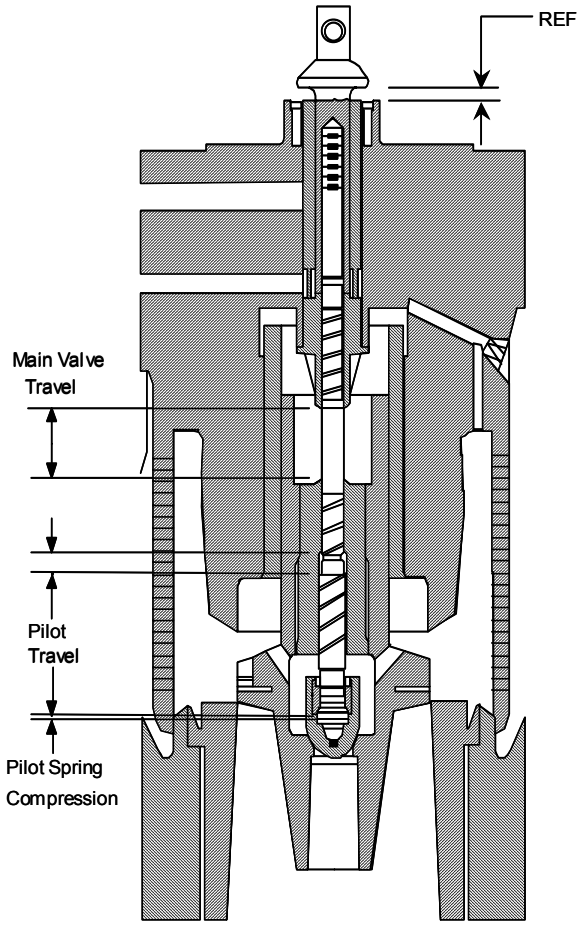
As Found Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/12/06_____

As Assembled Reading Taken By: _Burnheimer/VanDyke_____ Date: _4/24/06_____

Reviewed By Turbine Coordinator: __Powell_____ Date: _5/13/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Spring Guide Shown Seated



AXIAL TRAVEL			
NUMBER	DESCRIPTION		DISTANCE
1	A2 SPRING GUIDE SEATED		0.463
2	A1 SPRING GUIDE NOT SEATED		0.626
3	STEM BACKSEATED		1.167
4	MAIN VALVE BACKSEATED		5.482

CALCULATED VALUES		
DESCRIPTION	DISTANCE CALCULATION	VALUE
PILOT SPRING COMPRESSION	#2 MINUS #1	0.163
PILOT TRAVEL	#3 MINUS #2	0.541
MAIN VALVE TRAVEL	#4 MINUS #3	4.315
TOTAL TRAVEL	#4 MINUS #2	4.856

Mitchell U1	VALVE # 1

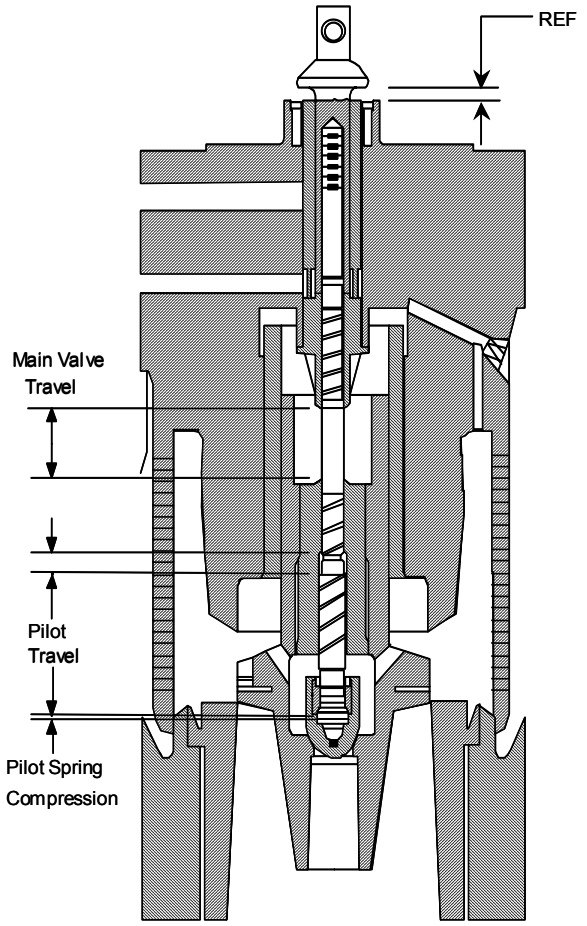
Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _Henning_____ Date: _5/17/06_____

As Assembled ____X_____ Reviewed By Turb Coord: __Powell_____ Date: _5/17/06_____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Spring Guide Shown Seated



AXIAL TRAVEL			
NUMBER	DESCRIPTION		DISTANCE
1	A2 SPRING GUIDE SEATED		0.553
2	A1 SPRING GUIDE NOT SEATED		0.705
3	STEM BACKSEATED		1.221
4	MAIN VALVE BACKSEATED		5.434

CALCULATED VALUES		
DESCRIPTION	DISTANCE CALCULATION	VALUE
PILOT SPRING COMPRESSION	#2 MINUS #1	0.152
PILOT TRAVEL	#3 MINUS #2	0.516
MAIN VALVE TRAVEL	#4 MINUS #3	4.213
TOTAL TRAVEL	#4 MINUS #2	4.729

Mitchell U1	VALVE # 2

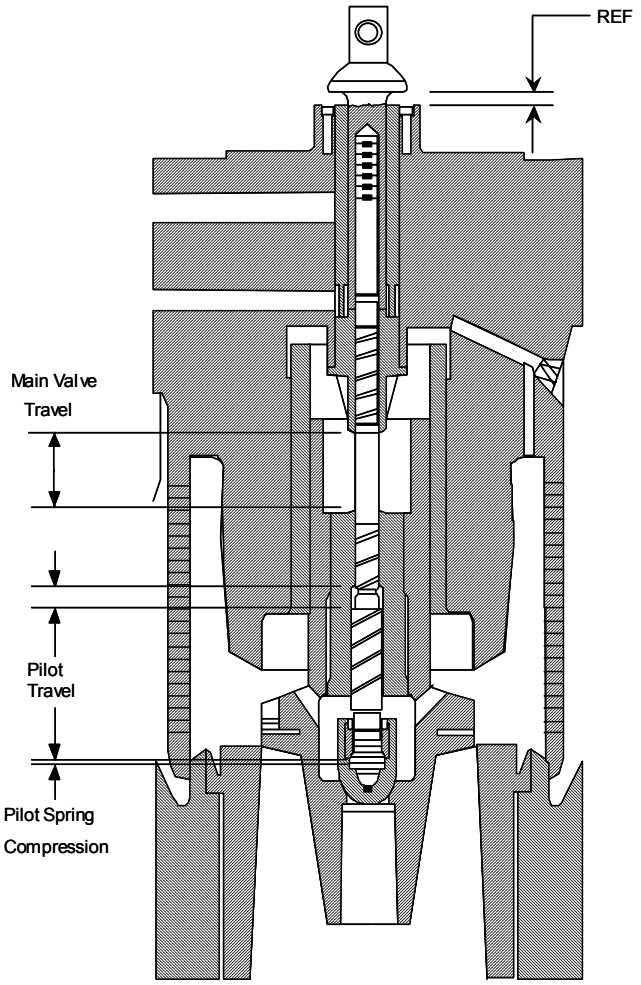
Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _Burnheimer_____ Date: _5/17/06_____

As Assembled ____X_____ Reviewed By Turb Coord: __Powell_____ Date: _5/17/06_____

CUSTOMER:	AEP	
LOCATION/UNIT #:		
THROTTLE VALVE		
BB/FRAME:		JOB NO.:
COMPONENT/S.O.:		DWG.:

Spring Guide Shown Seated



AXIAL TRAVEL			
NUMBER	DESCRIPTION		DISTANCE
1	A2 SPRING GUIDE SEATED		0.686
2	A1 SPRING GUIDE NOT SEATED		0.849
3	STEM BACKSEATED		1.361
4	MAIN VALVE BACKSEATED		5.436
CALCULATED VALUES			
DESCRIPTION		DISTANCE CALCULATION	VALUE
PILOT SPRING COMPRESSION		#2 MINUS #1	0.163
PILOT TRAVEL		#3 MINUS #2	0.512
MAIN VALVE TRAVEL		#4 MINUS #3	4.075
TOTAL TRAVEL		#4 MINUS #2	4.587

Mitchell U1	VALVE # 3

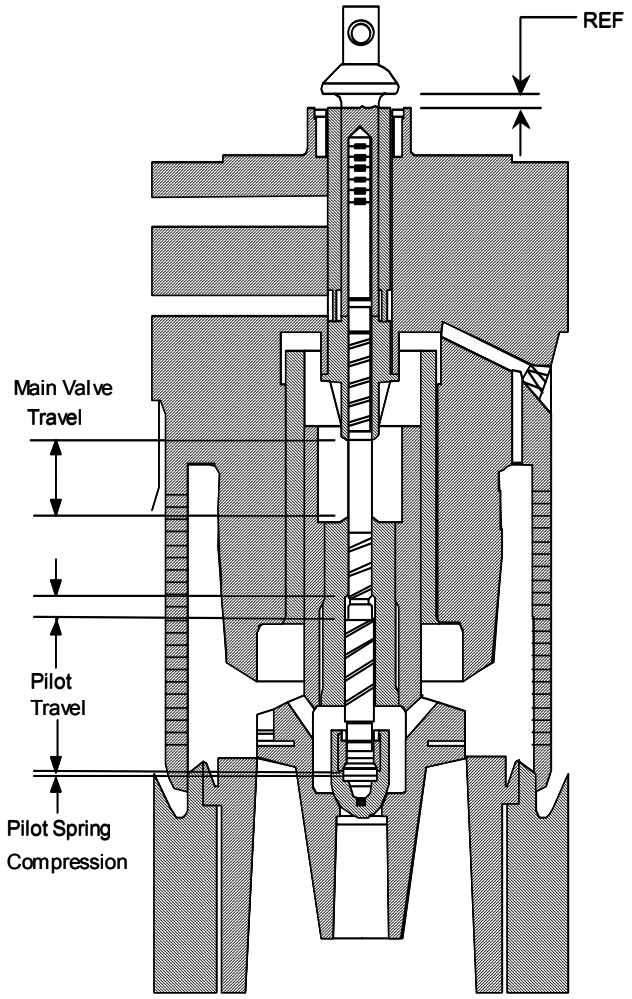
Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _Burnheimer_____ Date: _5/16/06_____

As Assembled ____X_____ Reviewed By Turb Coord: _____ Date: _____

CUSTOMER: AEP	
LOCATION/UNIT #:	
THROTTLE VALVE	
BB/FRAME:	JOB NO.:
COMPONENT/S.O.:	DWG.:

Spring Guide Shown Seated



AXIAL TRAVEL			
NUMBER	DESCRIPTION		DISTANCE
1	A2 SPRING GUIDE SEATED		0.505
2	A1 SPRING GUIDE NOT SEATED		0.640
3	STEM BACKSEATED		1.150
4	MAIN VALVE BACKSEATED		5.405
CALCULATED VALUES			
DESCRIPTION		DISTANCE CALCULATION	VALUE
PILOT SPRING COMPRESSION		#2 MINUS #1	0.135
PILOT TRAVEL		#3 MINUS #2	0.510
MAIN VALVE TRAVEL		#4 MINUS #3	4.255
TOTAL TRAVEL		#4 MINUS #2	4.765

Mitchell U1	VALVE # 4

Tool # Used _____ Cal. Due Date _____

As Found _____ Reading Taken By: _Bordenkircher_____ Date: _5/13/06_____

As Assembled ____X_____ Reviewed By Turb Coord: _Powell_____ Date: _5/13/06_____

Alignment

Couplings

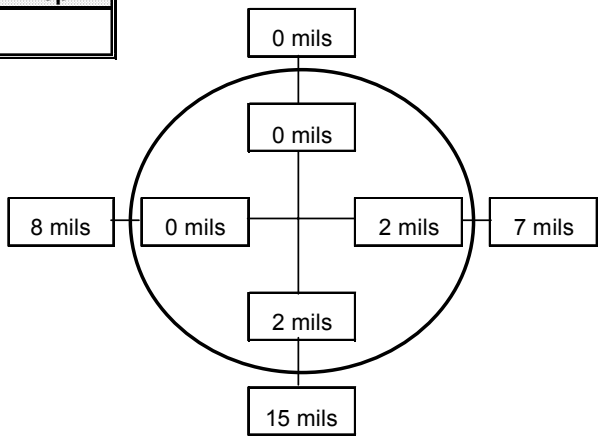
Date 5/8/2006 Turbine Serial No. MLU1 Prepared by Bordenkircher

Coupling BFP Sweep Diameter Indicator Mounted on Turb

Alignment Readings

Position	Top	Left	Bottom	Right	Top
Rim (Mils)	0 mils	8 mils	15 mils	7 mils	
Face 0º	0.945"	0.945"	0.947"	0.949"	
Face 90º	0.947"	0.945"	0.947"	0.948"	
Face 180º	0.931"	0.932"	0.932"	0.932"	
Face 270º	0.930"	0.931"	0.933"	0.931"	
Average	0.938"	0.938"	0.940"	0.940"	
Relative	0 mils	0 mils	2 mils	2 mils	

Check	Face	Rim
Top + Bottom=	2 mils	15 mils
Right + Left =	2 mils	15 mils
Difference=	0 mils	0 mils



Rim Recheck (If Necessary)

Position	Top	Left	Bottom	Right	Top
Rim (Mils)					

Comments:
Design - Turbine 7 mils high to pump, 14 mils TIR