BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF HAWAII

In the Matter of the Application of	)	
	)	
MAUI ELECTRIC COMPANY, LIMITED	)	Docket No. 2006-0387
	)	
For Approval of Rate Increases and Revised Rate Schedule and Rules	)	
	)	

FILED
OCT 30 2007
Public Utilities Commission

MECO
2007 TEST YEAR

MECO Voluminous Responses to
CONSUMER ADVOCATE
Information Requests

Book 12 of 12

October 30, 2007

CA-IR-330

Ref: MECO Responses to CA-IR-84, Attachment 1; CA-IR-279 (CT Major Overhaul Costs).

Please provide the following:

a. Detailed additional information supportive of the M16 major overhaul expense of $2,532,060 that served as the basis for escalated costs used to estimate normalized overhaul costs for M16, M17 and M19 prospectively, including but not limited to:

   1. Monthly actual expenses incurred in 1999 and 2000 by expense element to overhaul M16.
   2. Complete copies of scope of work and cost information from the "missing 1999-2000 overhaul report on M16" (response to CA-IR-279, part b) when it is found or replaced.
   3. Calculations indicating how historical actual costs were escalated to determine the $2,532,060 amount used in MECO-WP-505.

b. Explain all reasons why/if the 1999-2000 overhaul work on M16 is believed to be more indicative of future normalized overhaul costs for M16, M17 and M19 than the 2005 updated actual costs incurred to overhaul M14 in 2005.

c. Provide complete copies of all studies, reports, analyses, workpapers and other documents associated with your response to part (b) of this information request.

d. For each combustion turbine (units 14, 16, 17 and 19), provide the cumulative runtime hours at December 31 of each year since commencing commercial operation and at the date of each:

   1. Major Overhaul;
   2. Hot Section Replacement; and
   3. LPT Repair or other major outage event.

e. If your response to part (d) of this information indicates overhaul outages other than the 16,000 hour hot section and 50,000 hour major overhaul interval used in MECO-WP-505 to normalize overhaul activity, please explain the reasons for historical departures from these test year intervals.

MECO Response:

a. Note that the 2007 M16 overhaul has been completed at a cost of $3.7 million, as reflected in the response to CA-IR-330. The expenses to support the budget expense of $2,532,060 consist of $2,529,600 for the M16 overhaul plus $2,460 for use of cranes during the overhauls. The $2,460 was an estimate of $2,400 from Pacific Pile & Crane of $1,200 per

lift for two lifts in 2006. One lift was to remove the engine and install the spare while the other lift was to remove the spare and reinstall the overhauled engine. This $2,400 forecast was escalated from 2006 to 2007 with a 2006 base escalation factor of 2.5% ($2,400 x 1.025 = $2,460) as shown in the PILLAR screen print in Exhibit 1.

1. The monthly recorded expenditures for the M16 overhaul in 1999-2000 are shown in Exhibit 2, pages 1-3. There was a late charge recorded in March 2001 for this overhaul. This expense is shown on page 3.
2. The missing overhaul report has not been located. MECO is attempting to get a copy from the vendor that did the overhaul.
3. The year-end total from Expense Element 501 (Outside Services) was totaled for the three years in Exhibit 2. This total came out to be $2,320,734 (2003 dollars). An escalation rate of 9% (2003 base rate of 2.2% compounded to 2007) as shown in the PILLAR screen print in Exhibit 3 was used to escalate this expense to $2,529,600 (2007 dollars). This amount plus $2,460 in crane service was used for the test year combustion turbine overhaul forecast of $2,532,060.

b. The 50,000 hour overhaul on M16 in 1999-2000 was a complete overhaul of all engine components at a total cost of $2,320,734. The overhaul on M14 performed in 2005 did not include the cost for overhaul of the low pressure turbine ("LPT"). The approximate cost for a typical LPT overhaul is $630,000 as shown in CA-IR-84, page 12. If this approximate $630,000 cost was add to the $1,918,639 cost shown for the M14 overhaul the total overhaul cost would be $2,548,639 which would be close to the test year budget of $2,532,060.

c. The 2005 M14 overhaul report is 109 pages and is approximately ½ inch thick and hard bound. A copy of the first page of the report has been submitted in the response to

CA-IR-279, Exhibit 1, page 1. MECO has made a copy of this report and submit it as Exhibit 4 as requested by the Consumer Advocate.

d. Information for the cumulative run time hours of each combustion turbine at year end and at the date of each major overhaul, hot section replacement and LPT repair or other major outage event is shown in Exhibit 5. Under the date column the year-end dates are identified by the year as requested in this response. The dates in-between the years indicate when maintenance was done. Under the columns for the engine/package the hours for the overhauls or breakdown maintenance are indicated. Under the columns for hot sections the hours for each hot section replacement for the engines are indicated. The columns labeled LPT indicate the hours at which the LPT was taken out for repair. The last column describes the work that was done and at what T5.4 temperature the engine was run at. There were no other activities besides the 16,000 hour hot section replacements and 50,000 hour overhauls used for normalization purposes. There was an incident on April 1, 2006 with a bearing failure on unit M14 but this was not considered in normalizing maintenance costs for the combustion turbines.

JTS Aero Energy, Inc.
620 NW 35 Street • Boca Raton, FL 33431
(561) 417-4537 • FAX (561) 417-0772

Final Shop Report

Ref. (Customer/Work Order No.)
JTS Quote:

Receiving Date	Receiving Date
11 / 04 / 2005	2 / 18 / 2006

Dept.	Telephone	Extension
Engineering	561-417-4537	247

Customer
MAUI ELECTRIC CO.

Author(s)
Oscar Falcon & Sarita Herrera

Frame
LM2500

JTS Job Number
L5025

Customer Site
MAUI, HAWAII

Carlos Fabregas
Signature for Release by Dept. Concerned (for Contents, Handling, and Distribution)
Signature for External Release by Sales & Marketing Dept. (Not Required for Approval Documents)
Regional Sales Director
Larry Gasaway

Model No.	Engine Serial Number
See above	S/N 481-637

Document Identification No.
JTS_2005_042_MAUI_L5025

Pages of Text 109 Appendices 0

Equipment was shipped to JTS Aero Energy on November 4, 2005 for a zero- time overhaul. The proposed work scope at time of receiving was to perform a receiving inspection; perform visual inspection of external engine cases, plumbing, accessories & hardware, inventory components and accessories documenting shortages, and photograph complete engine externals.
This report summarizes the findings and all the repairs performed to the damaged components, all repairs were approved by the customer.

* In Technical Reports add key words (max. 12) at the end of summary; Minutes of Meeting to start with place, date and participants

Distribution (add "i.e.", if only Summary is distributed for information)			Index	Vers.	Date	Page(s)	Author's Initials	Initials for Release
JTS	Sales	JTS						
JTS	Site Support	JTS						
JTS	Engineering	JTS						
JTS	Testing Center	JTS						

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1 SERVICE BULLETINS IMPLEMENTED

Engine S/N 481-637 Service Bulletins Implemented

	082	VSV control installation of newer design	Previously implemented
CFF	085	No.3 Oil / Air seal high temperature capability	Previously implemented
CFF	091	Forward Nozzle ejector tube replacement	Previously implemented
IGB	102	Inlet Gearbox assembly - Cap improvement	Previously implemented
CFF	108	No.3R and No.5R Damper bearing upgrade	Previously implemented
AGB	093	Air / Oil separator cover improvement	Previously implemented
HPCR	059	Improved stg.13 bolting and non-bushed stage 11-13 spool	Previously implemented
HPCR	094	Inspection of HPCR Aft shaft external threads	Implemented during OH at JTS
HPCR	144	HPCR stages 15 & 16 Blades clearance increase	Implemented during OH at JTS
HPC/CRF	098	Improved No.4R bearing vent. Seals	Previously implemented
HPC/CRF	105	Improved B-sump insulation blankets and No.4R bearing heatshield	Previously implemented
HPC/CRF	168	CRF seal support replacement	Previously implemented
HPT	032	Improved power turbine stage 1 interstage seal	Previously implemented
HPT	028	Improved stage 2 HPT nozzle assembly	Previously implemented
HPT	087	HPT stage 1 support	Previously implemented
TMF	080	Hard coat of TMF liner and liner support	Implemented during OH at JTS
TMF	081	TMF hardware to update LPT nozzle supports	Previously implemented
TMF	115	No.5R and No.6R static oil seals	Previously implemented
TMF	116	TMF lube supply line wear	Previously implemented
TMF	167	TMF nozzle support bolts inspection	Implemented during OH at JTS
TMF/LPT	099	Upgraded TMF and LPT case flanges	Previously implemented

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2 COMPRESSOR FRONT FRAME

2.1 Frame Compressor Front

Findings: Removed per standard practice without major visual findings.
Taken Measures: Cleaned, Inspected, Pressure test lube oil lines

2.2 Housing Damper No. 3 Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Cleaned, Inspected

2.3 Support Assembly Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Cleaned, Inspected

2.4 Bearings Roller No. 3 (Damper)

Findings: Removed per standard practice without major visual findings. Replace #3R bearing due to heavy wear and tear
Taken Measures: Replaced with new part per work scope and customer agreement

2.5 Seal Stationary No. 3 Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

2.6 Seal Compressor Sta. Air

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

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Report No. L5025 | Customer MAUI
Handling **RESTRICTED** | Date 4/6/2006

2.7 Ring Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Cleaned, Inspected

Assembly of Compressor Front Frame

[redacted]

JOB: L 5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	ASSEMBLY OF COMPRESSOR FRONT FRAME					
1	Prior to assembly, check Workscope for all applicable Service Bulletins	x	x	x		
2	Pressure test Compressor front frame. Compressor front frame should be tested with the #3 housing and seal installed	x	x	x	9/L/91	
	Installation of # 3 bearing housing and seal support					
3	Heat seal support for 20 minutes or until hot to touch. Chill # 3 brg housing for 20 minutes in dry ice	x	x	x		
4	Remove seal support from oven and housing from dry ice. Position housing by matching top center line large hole over locating pin of seal support. Install four equally spaced bolts to seat housing to seal support	x	x	x		
5	Install 2ea new preformed packing. Install large preformed packing in outer groove and small packing in counterbore of scavenge oil port in seal support	x	x	x		
6	Chill seal support and housing. Install # 3 brg housing/seal support to CFF at inner hub flange. If non-damper bearing, install 16 bolts at every other hole excluding 12:00 o'clock position. For damper brg install 16 bolts	x	x	x		
7	Torque all bolts to 55 / 70 in lbs	56 in lbs	70 in lbs			
8	Perform dimensional runouts of # 3 bearing housing and seal support	0.002	0.006			
	No. 3 Brg Installation					
9	Note: Ensure bearing races are matched set					
	INNER RACE P/N 1959011901 S/N TBCLA354	x	x	x		
	OUTER RACE P/N 1959011901 S/N TBCLA354	x	x	x		
10	Install bearing from rear of frame. Install brg lock nut on aft side of bearing housing. Install 11ea. B-48 and torque to 70 in lbs	60 in lbs	70 in lbs			
11	Check axial clearance between bearing and lock nut using chart. Clearance shall be 0.035 - 0.315 inch	0.0035	0.015	.008		
12	Install packing on seal. Chill to near dry ice. Align bushings of # 3 brg stationary seal to seal mount on rear of CFF. Ensure oil drain hole is at 6:00 o'clock position	x	x	x		
13	Secure oil seal with 17 bolts. Allow seal to reach room temperature. Tighten bolts to 27 - 33 in lbs	27 in lbs	33 in lbs			
	Compressor Inlet Air Seal Installation					
14	Align Air seal to frame with top mark at 12:00 o'clock position. Secure seal with five Rainbeast screws. Torque screws to 13 - 37 in lbs	x	x	x		
15	Perform runouts and record in table below	x	x	x		
16	Measure Diameters of # 3 brg stationary seal and race and record in table below	x	x	x		
17	Min. Hub / Max. Eng A331 3.145 7.640 Dv 1.601 F/H 5.736 11.475 Ev 1.604					

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Report No. L5025 Customer MAUI

Handling **RESTRICTED** Date 4/6/2006

JOB: L 5025

	Service bulletin compliance					
11	Record service bulletins as required by customer specifications			X		
	S/B - 086 PCW (✓) CAV ( ) N/A ( )			X		
	S/B - 090 PCW (✓) CAV ( ) N/A ( )					
12	Final Inspection	X	X	X		

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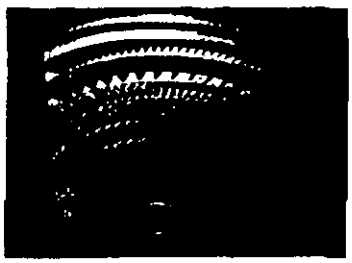
3 HIGH PRESSURE COMPRESSOR STATOR



3.1 Stage 1 Vane Compressor Stator

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.2 Stage 2 Vane Compressor Stator

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.3 Stage 3 Vane Compressor Stator

Findings: Removed per standard practice without major visual findings
Taken Measures: *Overhauled in accordance with manual*

3.4 Stage 4 Vane Compressor Stator

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.5 Stage 5 Vane Compressor Stator

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.6 Stage 6 Vane Compressor Stator

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.7 Stage 7 Vane Compressor Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.8 Stage 7 Vane Compressor Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.9 Stage 7 Vane Compressor Stator (Boro Upper)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

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3.10 Stage 7 Vane Compressor Stator (Boro Lower)

Findings: Removed per standard practice without major visual findings
Taken Measures: *Overhauled in accordance with manual*

3.11 Stage 7 Vane Compressor Stator (Left End)

Findings: Removed per standard practice without major visual findings
Taken Measures: *Overhauled in accordance with manual*

3.12 Stage 7 Vane Compressor Stator (Right End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.13 Stage 8 Vane Compressor Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.14 Stage 8 Vane Compressor Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.15 Stage 8 Vane Compressor Stator (Left End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.16 Stage 8 Vane Compressor Stator (Right End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.17 Stage 9 Vane Compressor Stator (Wide)

Findings: *Removed per standard practice without major visual findings*
Taken Measures: Overhaul in accordance with manual

3.18 Stage 9 Vane Compressor Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.19 Stage 9 Vane Compressor Stator (Left End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.20 Stage 9 Vane Compressor Stator (Right End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

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3.21 Stage 10 Vane Compressor Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.22 Stage 10 Vane Compressor Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.23 Stage 10 Vane Compressor Stator (Boro Upper)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.24 Stage 10 Vane Compressor Stator (Boro Lower)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.25 Stage 10 Vane Compressor Stator (Left End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.26 Stage 10 Vane Compressor Stator (Right End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.27 Stage 11 Vane Compressor Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.28 Stage 11 Vane Compressor Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.29 Stage 11 Vane Compressor Stator (Boro Upper)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.30 Stage 11 Vane Compressor Stator (Boro Lower)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.31 Stage 11 Vane Compressor Stator (Left End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

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3.32 Stage 11 Vane Compressor Stator (Right End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhauled in accordance with manual

3.33 Compressor Stator Case Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect, overhaul

3.34 Arm Vane Actuation Inlet Guide Vane

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

3.35 Sleeve Aligning Inlet Guide Vane

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

3.36 Stage 4 Arm Vane Actuation

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

3.37 Sleeve Lever Arm

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

3.38 Stage 5 Arm Vane Actuation

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

3.39 Stage 1 Shroud Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.40 Stage 2 Shroud Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.41 Rear Case Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.42 Forward Dovetail Liner Vane

Findings: Removed per standard practice
Taken Measures: Replaced with new

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3.43 Aft Dovetail Liner Vane

Findings: Removed per standard practice
Taken Measures: Replaced with new

3.44 Stage 12 Vane Compressor Rear Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: *Overhaul in accordance with manual*

3.45 Stage 12 Vane Compressor Rear Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.46 Stage 12 Vane Compressor Rear Stator (Boro)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.47 Stage 12 Vane Compressor Rear Stator (End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.48 Stage 13 Vane Compressor Rear Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.49 Stage 13 Vane Compressor Rear Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.50 Stage 13 Vane Compressor Rear Stator (Boro)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.51 Stage 14 Vane Compressor Rear Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.52 Stage 14 Vane Compressor Rear Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.53 Stage 14 Vane Compressor Rear Stator (Boro)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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3.54 Stage 14 Vane Compressor Rear Stator (End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.55 Stage 15 Vane Compressor Rear Stator (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.56 Stage 15 Vane Compressor Rear Stator (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.57 Stage 15 Vane Compressor Rear Stator (Boro)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.58 Stage 15 Vane Compressor Rear Stator (End)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.59 Stage 16 Vane OGV (Wide)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.60 Stage 16 Vane OGV (Narrow)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.61 Stage 16 Vane OGV (Upper Left)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.62 Stage 16 Vane OGV (Upper Right)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

3.63 Stage 16 Vane OGV (Lower Case)

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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Report No. L5025 Customer MAUI

Handling ***RESTRICTED*** Date 4/6/2006

Assembly of Compressor Front Stator

JOB: L 5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	ASSEMBLY OF COMPRESSOR FRONT STATOR					
note:	**Prior to assembly, check Workscope for all applicable Service Bulletins.**	X	X	X	X	X
	Record the following:	X	X	X	X	X
1	Nomenclature Part Number Serial Number **Forward Case** 4206m96G05 UAPL 6171	X	X	X		
	Install variable vanes and record below.	X	X	X	X	X
2	UPPER CASE: INSTALL IGV - 6TH STG VANES	X	X	X		
3	LOWER CASE: INSTALL IGV - 6TH STG VANES	X	X	X		
3a	**Measure rotational torque. Torque shall be 1-10 in lbs. Replace spacer if rotational torque is less or greater than desired value**	1in lb	10 in lbs			
	Install Shrouds IGV - 2ND STG	X	X	X	X	X
4	UPPER CASE: INSTALL IGV - 2ND STG SHROUDS	X	X	X		
4a	LOWER CASE: INSTALL IGV - 2ND STG SHROUDS	X	X	X		
5	Install actuating ring segments with part number facing up or aft, onto upper and lower case just to rear of assembled vanes. Start at one end and wrk toward other, slipping segment under and onto actuation arm pins. It may be necessary to remove some vane actuation arms to get segments onto arm pins	X	X	X		
5A	UPPER CASE: INSTALL IGV - 6TH STG SEGMENTS	X	X	X		
5B	LOWER CASE: INSTALL IGV - 6TH STG SEGMENTS	X	X	X		
6	Install fixed vanes stages 7 through 11 by sliding cases into grooves of each case half	X	X	X		
	Measure circumferential clearances of vanes as follows:					
7	Clamp parallel bar to one horizontal flange of case. Push all vanes to one side, so that vanes are stopped by parallel bar. Measure gap between last vane and flange surface opposite parallel bar.	X	X	X		
	END GAP MEASUREMENT UPPER CASE					
8	STAGE SEVEN	071"	111"	.103		
9	STAGE EIGHT	086"	126"	.116		
10	STAGE NINE	095"	135"	.132		
11	STAGE TEN	107"	147"	.137		
12	STAGE ELEVEN	110"	156"	.135		

ASSY 015 A J 5504 ISO-Work Instructions 15 kg Jmz 500 ab (IPCS I 1 of 2

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Report No. L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006

JOB: L 5025

ITEM	OPERATION	MIN.	MAX	ACTUAL	MECH.	VERIFY
	END GAP MEASUREMENT LOWER CASE.					
13	STAGE SEVEN	.071"	.111"	.111		
14	STAGE EIGHT	.080"	.120"	.112		
15	STAGE NINE	.095"	.135"	.126		
16	STAGE TEN	.107"	.147"	.126		
17	STAGE ELEVEN	.116"	.156"	.144		
18	Verify borescope vane alignment with borescope plug ports. Then install the borescope plugs and safetywire	X	X	X		
19	Secure keys to front upper case by staking each key at two places adjacent to case flange at four locations at each end, between stages 7 & 8 and between stages 9 & 10.	X	X	X		
20	Apply tape to lower case along horizontal flange to hold fixed vanes in place	X	X	X		
21	Install vane actuator mount brackets	X	X	X		
22	Prep front compressor cases for tip grinding	X	X	X		
24	Final Inspection	X	X	X		

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Report No. L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006

Assembly of Compressor Rear Stator

JOB: L 5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	ASSEMBLY OF COMPRESSOR REAR STATOR					
1	Prior to assembly, check Workscope for all applicable Service Bulletins.	X	X	X		
2	Record the following:	X	X	X	X	X
2A	Nomenclature Part Number Serial Number REAR Case 9686 M81609 S/N CDPT 6485	X	X	X		
	INSTALL UPPER CASE VANES					
3A	UPPER CASE: INSTALL 12TH - 16TH STG VANES	X	X	X		
3B	LOWER CASE: INSTALL 12TH - 16TH STG VANES	X	X	X		
4	Clamp parallel bar to one horizontal flange of case. Push all vanes to one side so that vanes are stopped by parallel bar. Measure gap between last vane and flange surface opposite parallel bar.	X	X	X		
	END GAP MEASUREMENT UPPER CASE.					
5A	STAGE TWELVE	040"	080"	.056		
5B	STAGE THIRTEEN	044"	084"	.067		
5C	STAGE FOURTEEN	047"	087"	.074		
5D	STAGE FIFTEEN	050"	090"	.066		
5E	STAGE SIXTEEN (OGV)	050"	090"	.079		
	END GAP MEASUREMENT LOWER CASE.					
6A	STAGE TWELVE	040"	080"	.053		
6B	STAGE THIRTEEN	044"	084"	.058		
6C	STAGE FOURTEEN	047"	087"	.069		
6D	STAGE FIFTEEN	050"	090	.069		
6E	STAGE SIXTEEN (OGV)	050"	090"	.076		
7	Verify borescope vane alignment with borescope plug points. Then install the borescope plugs and safetywire.	X	X	X		
8	NOTE Borescope inspection ports, except for stages 13 and 14, are located in lower case half. Ports for stages 14 are located in upper case half.					
9	Secure keys to upper case by staking each key at two places adjacent to case flange near each end of keys, and midway between stages 13 and 14 vanes (944).	X	X	X		

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Handling ***RESTRICTED*** Date 4/6/2006

JOB: L5025

10	Apply tape to inner case along horizontal flange to hold fixed vanes in place	X	X	X		
11	Prep rear compressor cases for lip grinding	X	X	X		
12	**Final Inspection**	X	X	X		

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4 HIGH PRESSURE COMPRESSOR ROTOR

4.1 Stage 1 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect, and overhaul in accordance with manual

4.2 Stage 2 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect, and overhaul in accordance with manual

4.3 Stage 3 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.4 Stage 4 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.5 Stage 5 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.6 Stage 6 Compressor Rotor Blade

Findings: Removed per standard practice. Qty. 12 blades were dispositioned scrapped during inspection.
Taken Measures: Overhaul in accordance with manual. Qty. 12 were scrapped and replaced

4.7 Stage 7 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.8 Stage 8 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.9 Stage 9 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.10 Stage 10 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.11 Stage 11 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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4.12 Stage 12 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.13 Stage 13 Compressor Rotor Blade

Findings: Removed per standard practice. Several blades tips were noted to be scrap during visual inspection
Taken Measures: Overhaul in accordance with manual

4.14 Stage 14 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.15 Stage 15 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.16 Stage 16 Compressor Rotor Blade

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.17 C-1 Disk

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.18 C-2 Disk

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.19 3-9 Spool

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.20 C-10 Disk

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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4.21 11-13 Spool

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.22 14-16 Spool

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.23 Air Duct

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.24 Rear Shaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

4.25 Hub Tie Support

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

4.26 Hub Tie Clamp

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

4.27 Rotating Vent Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.28 Vent Air Seal Nut

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

4.29 Retaining Ring

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

4.30 Seal Assembly No 4R Rotating Air

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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Report No L5025
Handling **RESTRICTED**

Customer MAUI
Date 4/6/2006

Assembly of High Pressure Compressor

JOB: L 5025

ITEM	OPERATION	MIN.	MAX.	ACTUAL	MECH.	VERIFY
	ASSEMBLY OF HIGH PRESSURE COMPRESSOR					
1	Prior to assembly, Check Worksscope for all applicable Service Bulletins	X	X	X		
	Verify & Record P/N and S/N of all piece parts to be installed					
2	Record the following:	X	X	X	X	
2A	Nomenclature / Part Number / Serial Number C-1 DISK 902 1M62P04 CHZ 783	X	X	X		
	ASSEMBLY OF COMPONENTS					
3	Perform spline adapter installation	X	X	X		
	Runout .001 .001" Max FIR .001	X	X			
4	Install the blades and retainers in the stg 1 disk	X	X	X		
5	Install the blades and retainers in the stg 2 disk	X	X	X		
	NOTE: END GAP CLEARANCE FOR STAGES 3-16 IS .001 - .014"	X	X	X	X	X
6	Install the blades in stages 3 - 9 spool	X	X	X		
7	Perform assembly of stage 10 disk	X	X	X		
7a	Record P/N 902 1M62P03 S/N G00NK9927	X	X	X	X	X
8	Perform assembly of stage 11 - 13 spool	X	X	X		
8a	Record P/N 902 1M62P07 S/N GEE14500	X	X	X	X	X
9	Perform assembly of stage 14 - 16 spool.	X	X	X		
9a	Record P/N 902 1M62P12 S/N MP0A5505	X	X	X	X	X
	Perform individual balance of compressor rotor components.					
10	Perform balance of stage 14 - 16 Spool 10 GRM IN 1.6	X	X	X		
11	Perform balance of stage 11 - 13 Spool 10 GRM IN 4.4	X	X	X		
12	Perform balance of stage 10 Disk 10 GRM IN 4.8	X	X	X		
13	Perform balance of stage 2 Disk 10 GRM IN 4.0	X	X	X		
14	Perform balance of stage 1 Disk 10 GRM IN 8.8	X	X	X		

ASSY-015-A

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Report No L5025 | Customer MAUI
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JOB: L5025

ITEM	OPERATION	MIN	MAX	ACTUAL		VERIFY
15	Perform dynamic balance of 3 - 9 Spool	x	x	x		
	Left plane .322 Right plane .545	x	x	x		
16	Seat the stage 1 Blade retainers	x	x	x		
17	Seat the stage 2 Blade retainers	x	x	x		
18	Set up the HPC Rotor Assembly future as follow	x	x	x		
	.001 .001 Runout (limit .0002") Flatness (limit .0002")					
	Stage 14 - 16 Spool to Aft Shaft Assembly					
19	Measure and record rabbet diameters of mating parts. Compute interference fit between mating flanges which must be .001 - .009" inch.	0.001	0.009			
20	*Assemble the stage 14-16 Spool to Aft shaft*	x	x	x		
21	Check concentricity at rabbet Diameter D. Concentricity must not exceed .002"	x	.002"	.001		
	Check perpendicular at Surface C. Perpendicular must not exceed .0015"	x	.0015"	.001		
	Check perpendicular at air duct seating Surface A. Perpendicular must not exceed 0.0005"	x	.0005"	.002		
	Check concentricity of Stage 16 Inside Diameter X. Concentricity must not exceed 0.0025"	x	.0025"	.002		
	Stage 11 - 13 Spool to 14 - 16 Spool and Aft shaft Assembly					
22	Measure and record rabbet diameters of mating parts. Compute interference fit between mating flanges which must be .001 - .009" inch	0.001	0.009	.003		
23	Install stage 11-13 Spool to Stage 14-16 Spool and aft shaft assembly	x	x	x		
24	Install 8 new nuts equally spaced and torque to 340 - 350 in/lbs	340in/lbs	350in/lbs			
25	Measure concentricity of forward nonrestrained flange rabbet Diameter L. Concentricity must not exceed 0.002"	x	.002"	.001		
26	Measure perpendicular of forward nonrestrained flange Surface K. Perpendicularity must not exceed 0.002"	x	.002"	.001		
	Stage 10 Disk to stages 11 - 13 Spool FWD Flange Assembly					
27	Measure and record rabbet diameters of mating parts. Compute interference fit between mating flanges which must be .001 - .009" inch	0.001	0.009	.002		
28	Install the Stage 10 Disk Assembly to the Stage 11 - 13 Spool Assembly	x	x	x		
29	Measure concentricity of forward rabbet Diameter N. Concentricity must not exceed 0.002"	x	.002"	.001		

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Handling RESTRICTED Date 4/6/2006

JOB: L 5025

ITEM	OPERATION	MIN.	MAX.	ACTUAL	MECH.	VERIFY
30	Measure perpendicular of forward Surface M. Perpendicularity must not exceed 0.0018"	X	0016"	.001	LHS	
	Stages 3-9 Spool to Stage 10 Disk Forward Flange Assembly					
31	Measure and record rabbet diameters of mating parts. Compute interference fit between mating flanges which must be .001 - .009" inch.	0.001	0.009	.002	LHS	
32	Install the stage 3-9 Spool to stage 10 Disk	X	X	X	LHS	
32a	Record P/N S/N	X	X	X		
33	Torque spool to 220-230 in/lbs	220in/lbs	230in/lbs		LHS	
34	Measure concentricity of forward nonrestrained flange rabbet Diameter P. Concentricity must not exceed 0.0035"	X	.002"	.002	LHS	
35	Measure perpendicular of forward nonrestrained flange Surface R. Perpendicularity must not exceed 0.003"	X	.002"	.001	LHS	
	HPCR Air Duct Installation					
36	Install threaded Air Duct and torque to 950 - 1000 ft/lbs.	950ft/lbs	1000ft/lbs		LHS	
37	Inspect runout of air duct forward sealing surface. Allowable limit is 0.010" inch	X	0.010"	.005	LHS	
38	Perform and record interference fit of the C-2 Disk to the 3-9 Spool	.001"	.009"	.002	LHS	
39	Install the stage 2 Disk to the 3-9 spool assembly.				LHS	
40	Perform and record # 3 bearing Journal, Dim. DA	X	0.002"	.001	LHS	
41	Measure and record forward rabbet diameter of stage 2 Disk and Rabbet Diameter of stage 1 Disk. Compute interference fit between mating flanges which must be .001 - .009" inch	.001"	0.009"	.003	LHS	
42	Install the stage 1 Disk to the stage 2 Disk and torque to 100 - 110 in/lbs	100in/lbs	110in/lbs		LHS	
43	Measure concentricity of stage 1 Disk bore Diameter S. Concentricity must not exceed 0.0035"	X	.0035"	.002	LHS	
44	Install the vent Air Seal on the Compressor Rotor Rear Shaft and Torque the # 4 brg. Vent air seal nut to 2000 - 2300 ft/lbs	2000ft/lbs	2300ft/lbs		LHS	
	Install seal nut retaining ring	X	X	X	LHS	
45	Perform Rotor balance before grind	X	X	X		
	Left plane Right plane	X	X	X		
46	Perform Compressor Rotor pre grind inspection. Measure and mark longest & # 1 blade for each stage	X	X	X		
47	Perform tip grinding of the Compressor Rotor Blades	X	X	X		

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Report No L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006

JOB: L5025

ITEM	OPERATION	MIN	MAX.	ACTUAL	MECH.	VERIFY
48	Verify the blade tip radius.	X	X	X		
49	Perform final check balance of compressor rotor assembly after blade grind	X	X	X		
50	Tolerance = 10 in/grams	X	10 IN/GR	X		
51	Left plane .729 Right plane 1.21	X	X	X		
52	Using DYKEM. Mark the heavy angle of unbalance on the fwd and aft surfaces of the HPC Rotor.	X	X	X		
54	Final inspection	X	X	X		

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5 COMPRESSOR REAR FRAME

5.1 *Compressor Rear Frame*

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.2 Insulation Blanket Thermal Forward Bearing No. 4R

Findings: *Removed per standard practice without major visual findings*
Taken Measures: Clean, Inspect

5.3 Seal Oil Stationary Bearing 4R

Findings: *Removed per standard practice without major visual findings*
Taken Measures: Overhaul in accordance with manual

5.4 Seal No. 4R Bearing Forward Stationary Air

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.5 Shield Heat Bearing 4R

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

5.6 Seal Assembly Vent Air; Stationary

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.7 Seal Assembly CDP Stationary

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.8 Housing No 4B

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

5.9 Bearing No. 4B

Findings: Removed per standard practice without major visual findings
Taken Measures: *Replaced with new per work scope and customer agreement*

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5.10 Seal Oil Stationary Bearing 4B

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

5.11 Seal Assembly No 4 Outer Stationary Air

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.12 Seal Assembly Aft Stationary Air

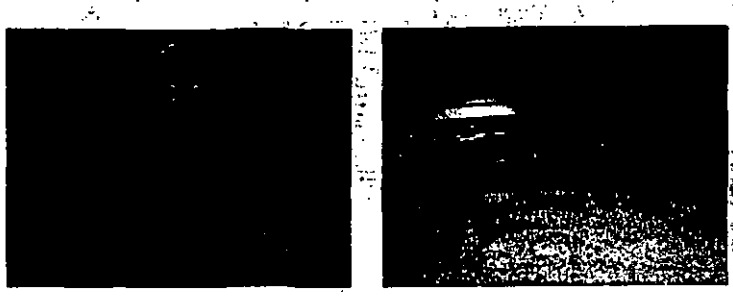
Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.13 Nut No. 4 Bearing Spline Split

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.14 Bearing No. 4R

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement



5.15 Liner Assembly Combustor Chamber

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.16 Seal No. 4B Bearing, Air oil

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.17 Seal CDP Rotating Air

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

5.18 Seal, Oil, Rotating No. 4R Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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Handling RESTRICTED Date 4/6/2006

Assembly of Compressor Rear Frame

JOB: L 5025

ITEM	OPERATION	MIN.	MAX	ACTUAL	MECH	VERIFY
	ASSEMBLY OF COMPRESSOR REAR FRAME					
	Prior to assembly, check Workscope for all applicable Service Bulletins.	X	X	X		
	Record the following:	X	X	X		X
1	Nomenclature Part Number Serial Number Comp Rear Frame 9103M30G30 GEVR 8091	X	X	X		
2	Note: Remove all protective caps & closures from lube oil and vent tubes. Blow out all tubes with dry, filtered shop air from inside frame outward	X	X	X		
3	Installation of Combustor.	X	X	X	X	X
	9101M27G73 GGMVVAT4 Record P/N and S/N	X	X	X		
4	Insert .070" inch feeler gage into aft inner and outer fishmouth seals of combustion liner to ensure that seal openings will accept stage 1 HPT Nozzle seals. Move feeler gage completely around each seal. If required open seals to .070" using a brass wedge	X	X	X		
5	Insure the combustor igniter holes located at 4:00 - 5:00 o'clock position, aft looking forward are aligned with CRF igniter holes	X	X	X		
6	Align mounting pins and install pins. Torque pins to 300 - 360 in lbs. Mounting pins will be safety wired when fuel nozzles are installed	300in lbs	360in lbs	X		
7	Measure clearance between combustor outer skirt seal and rear frame at 12 approximately equally spaced locations. Average minimum clearance shall not be less than 0.0150". Minimum at any one place shall not be less than 0.0100"	.0100"	0.0150"	X		
8	Install forward insulation blankets	X	X	X		
	Installation of the # 4R Bearing stationary oil seal.					
9	Install 2ea. Packings. Chill oil seal and preformed packing in dry ice for approximately 20 minutes	X	X	X		
	Align holes in seal with holes in mounting flange (Holes will only line up in one position since one hole is offset from the others) and install oil seal. Seal seal with four slave bolts and allow to return to room temperature	X	X	X		
11	Perform runout check on forward oil seal Record Runout : B21F .005	X	X	X		
12	Heat # 4 stationary air sump vent seal at approximately 300°F for 20 minutes. Remove from oven (Wear thermal gloves when handling) Align holes and install the forward air seal and heat shield using 20 bolts and washers, then torque to 33 - 37 in/lbs	33in lbs	37in lbs	X		
13	Perform runout check on forward air seal Record Runout : B57F .005	X	X	X		
14	*Chill forward # 4R Bearing stationary vent air seal*	X	X	X		
15	Install Air seal aligning air tubes of seal with holes in frame at 3:00 and 9:00 o'clock positions	X	X	X		
16	Torque seal 30 ea. Bolts to 80 - 90 in/lbs	80in lbs	90in lbs	X		
17	Perform runout check on vent seal	X	X	X	X	X
	Record Runout. B72F .004	X	X	X		

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Handling **RESTRICTED** Date 4/6/2006

JOB: L 5025

ITEM	OPERATION	MIN.	MAX.	ACTUAL	MECH.	VERIFY
	Installation of Compressor Discharge Pressure Seal (CDP)					
18	Chill CDP Seal in dry ice for 20 minutes	x	x	x		
	Install CDP Seal in forward side of CRF. Seal with 60 bolts	x	x	x		
	Torque bolts to 70 - 80 in/lbs	70 in lbs	80 in lbs	X		
	Record Runout : B30F .007	x	x	X		
	Installation of CRF Aft Seals					
19	Determine average clearance between # 4B Bearing housing and bearing housing bore in CRF	x	x	x		
	Clearance shall be at least .006" in at each clock position	.006"	X	.006		
	Install # 4 Bearing housing with slave bolts and allow time for room temperature to be reached .	x	x	x		
20	Remove slave bolts and install # 4 bearing stationary oil seal	x	x	x		
21	Record Runout B26F	x	x	.002		
	Record Runout B69F	x	x	.007	[illegible]	
22	Record Runout B70AF	x	x	.005	[illegible]	
	Record Runout B71F	x	x	.005	[illegible]	
23	Match mark and remove seals	X	X	X	[illegible]	
	Record Part number and Serial number of # 4 bearing	x	x	x	x	x
24	# 4 BALL BRG P/N 9648M01P14 S/N MRCK811	x	x	x		
	OUTER RACE P/N 9648M01P14 S/N MRCK811	x	x	x		
25	No. 4 Ball Bearing and Housing Assembly	x	x	x		
	Note. Assure bearing and races are a matched set	x	x	x		
26	Lubricate # 4 brg outer race, place into plastic bag, and chill in dry ice	x	x	x		
27	Place bearing housing into fixture forward side down	x	x	x		
28	Secure flange of housing to fixture with five bolts	x	x	x		

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Report No L5025 | Customer MAUI

Handling *RESTRICTED* | Date 4/6/2006

JOB: L5025

ITEM	OPERATION	MIN.	MAX.	ACTUAL	MEAS.	VERIFY
29	Place outer race into housing with serial number on race at 12:00 o'clock position of bearing housing, and aft mark facing up. Serial number is on aft side of outer race	X	X	X		
30	Check seating of outer race with .001" feeler gage. If feeler sticks fits between race and housing, remove race and reinstall as directed	X	X	X		
31	Install spanner nut into bearing housing to secure outer race. Install spanner wrench. Tighten spanner nut to 450 LB ft, and check that nut hole is in alignment with hole in housing. If no holes align, tighten to a higher torque not to exceed 500 LBS/FT of torque until holes align	450 ft/lbs	500 ft/lbs	X		
32	Install two fasteners (blind rivets) to secure bearing spanner nut to housing	X	X	X		
33	Perform Step D; SEAL Measurements:	X	X	X	X	X
	Record Step D2, minimum diameter B66F 7.098	X	X	X		
	Record Step D4, minimum diameter H68F 8.940	X	X	X		
	Record Step D6, minimum diameter B70A 8.748	X	X	X		
	Record Step D7, minimum diameter B71F 11.249	X	X	X		
34	Remove and tag all seal by matching P/N and S/N	X	X	X		
35	Perform Step F; SEAL Measurements:	X				
	Record Step F1, minimum diameter B21F 7.075	X	X	X		
	Record Step F2, minimum diameter B5A 8.757	X	X	X		
	Record Step F3, minimum diameter B7A 10.382	X	X	X		
	Record Step F4, minimum diameter B9A 12.530	X	X	X		
36	Install the # 4 roller bearing and torque retainer nuts to 60 - 70 inlbs, the lockwire.	60 INLBS	70 INLBS	X		
	Note: Assure bearing and races are a matched set.					
37	Record Part number and Serial number of # 4 bearing	X	X	X	X	X
	46Y1M26F07 MAUI MA 5825 # 4 Roller BRG P/N S/N			X		
	46Y1M26F09 MAUI MA 5826 OUTER RACE P/N S/N			X		
38	Perform oil nozzle impingement check and perform flow check, using dry filtered shop air at 5 - 10 psig introduce air strut no. 10			X		
	CRF Seal diameter measurements:					
39	Place 24" long parallel bar across forward face of No. 4 bearing stationary CDF air seal and Dimension A tool across front face of No. 4 bearing outer race. Measure drop (axial distance from top of parallel bar to top of Dimension A tool) to .001 inch Add 0.150 inch to measured value. Record as Dimension A	X	X	X		

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Report No. L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006

JOB: L5025

ITEM	OPERATION	MIN	MAX	ACTUAL	[illegible]	VERIFY
40	Measure drop dimension from parallel bar to face of CDP air seal. Subtract drop measurement from Dimension A and record difference. B51F/B50M	X	X	X	[illegible]	
41	Determine each required minimum radius by subtracting FIR from minimum diameter and dividing remainder by two	X	X	X	[illegible]	
42	Install Mid Flange brackets	X	X	X	[illegible]	
43	Install the external plugs, plates, screws, reducers and set screws accordingly	X	X	X	[illegible]	
45	Final Inspection.	X	X	X	[illegible]	[illegible]

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Report No. L5025 Customer MAUI
Handling RESTRICTED Date 4/6/2006

Jet Turbine Services

LM2500 CRF ASSEMBLY DIMENSIONS

WO# L5025

Customer: MAUI

DETERMINE DIMENSIONAL DATA, LOCATE AND IDENTIFY PARTS TO BE INSTALLED: INDICATE IF "NEW", "RWK" OR "ORG".

NOTE: MINIMUM DIMENSIONS SHOULD NOT BE VIOLATED.
MAXIMUMS ARE USED FOR OVERHAUL CRITERIA AND ARE NOT LIMITING, EXCEPT FOR FULL INDICATED RUNOUT (FIR) MAXIMUMS.

DIMENSIONAL FORMULA B____F = (MIN. DIA. – FIR) / 2

NO 4R STA OIL SEAL.
P/N 9693M48P04 S/N MATD 2361 FROM ____
B21F FIR (MAX .005") .005
B21F OVERHAUL REF. LIMITS 3.545" – 3.548" B21F 3.545
MECH

FWD STA INNER AIL SEAL.
P/N 9686M44P03 S/N MATC 9872 FROM ____
B57F FIR .005
B57F OVERHAUL REF. LIMITS 4.490" – 4.500" B57F 4.496
MECH

FWD STA VENT SEAL (INNER DIA.)
P/N L44540G01 S/N TRIP 0298 FROM ____
B72F FIR .004
B72F OVERHAUL REF. LIMITS 5.189" 5.194" B72F 5.189
MECH

FWD VENT SEAL STA. (OUTER DIAMETER)
B56F FIR .004
B56F OVERHAUL REF. LIMITS 6.259" 6.265" B56F 6.263
MECH

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Jet Turbine Services

LM2500 CRF ASSEMBLY DIMENSIONS

WO# L 5025 Customer: MAUI

FWD STA CDP AIR SEAL
P/N 9174M68G02 S/N GNZLK292 FROM
B30F FIR .007
B30F OVERHAUL REF. LIMITS 9.072" – 9.076" B30F 9.072
MECH

NO 4B STA OIL SEAL.
P/N 9693M49P03 S/N TSCAT027 FROM
B26F FIR (MAX .006") .002
B26F OVERHAUL REF. LIMITS 3.544" – 3.548" B26F 3.548
MECH

AFT OUTER AIR SEAL STA. AFT. VENT SEAL (2nd)
P/N L44541G01 S/N TRTP2220 FROM
B69F FIR (MAX .010") .007
B69F OVERHAUL REF. LIMITS 4.459" – 4.466" B69F 4.466
MECH

AFT STA PRESSURE BALANCE SEAL (FWD)
P/N 9693M20G11 S/N M587677 FROM
*B70F FIR (MAX .008") -.003
*B70F OVERHAUL REF. LIMITS 4.371" – 4.373" B70F 4.371
MECH

PRESSURE BALANCE SEAL AFT
*B71F FIR (MAX .008") .005
*B71F OVERHAUL REF. LIMITS 5.621" – 5.623" B71F 5.621
MECH

* IF LIMITS ARE EXCEEDED, SEAL MAY BE ROTATED ON 90° INCREMENTS. THE SLOT IN THE FLANGE AND THE WORD "TOP" MAY BE AT 3, 6 & 9 AS WELL AS 12 O' CLOCK. IF STILL NOT WITHIN LIMITS REPLACE SEAL AND RECHECK RUNOUT.

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Jet Turbine Services

LM2500 CRF ASSEMBLY DIMENSIONS (CONT.)

WO# L 5025

Customer: MAUI

DIMENSION "A" (FWD FACE OF CDP SEAL TO DIMENSION A TOOL PLUS
(R ~~.150"~~) .500

(DROP) – (PARALLEL BAR) = (FIXED NUMBER) + (TOOL)

7.210 - 1.00 = 6.210 + .500 = 6.710

CDP SEAL DROP DIMENSION B51F/B50M 6.710

B51F/B50M REF. 6.684 MECH

B33 AXIAL CLEARANCE BETWEEN NO. 4B HOUSING FORWARD END AND CRF (MIN. .016")

B33 .020

MECH

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Report No. L5025 Customer MAUI
Handling RESTRICTED Date 4/6/2006

Jet Turbine Services

CRF FINALASSEMBLY DIMENSION SHEET

WO# L 5025 Customer: MAUI

1. OBTAIN DIMENSIONS FROM ASSEMBLY DIMENSION WORKSHEET.
2. FORWARD WITH CRF MODULE TO FINAL ASSEMBLY.

NO. 4R BEARING OIL SEAL	B21F	3.545
NO. 4R STA INNER AIR SEAL	B57F	4.446
NO. 4R BEARING INNER VENT SEAL	B72F	5.184
NO. 4R BEARING OUTER VENT SEAL	B56F	6.263
NO. 4R BEARING STA. CDP SEAL	B30F	9.072
NO. 4R BEARING STA. OIL SEAL	B26F	3.548
NO. 4R BEARING STA. AIR SEAL	B69F	4.466
AFT PRESSURE BALANCE SEAL (FWD)	B70F	4.371
AFT PRESSURE BALANCE SEAL	B71F	5.621
FWD CDP SEAL DROP DIMENSION	B51F/B50M	6.710

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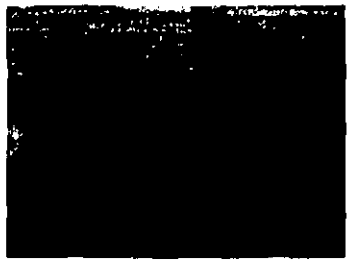
6 STAGE 1 NOZZLE

6.1 Stage 1 HPT Nozzle Support Assembly

Findings: *Removed per standard practice.*
Taken Measures: Overhaul in accordance with manual



Stator Seat Vane missing in the Stage 1 Nozzle Assembly.

6.2 Stage 1 Vanes

Findings: Removed per standard practice. One vane was missing when assembly was received
Taken Measures: Scrapped and replaced with new

6.3 Seal HPT Stator Inner

Findings: Removed per standard practice. Several tabs were missing and some were scrapped
Taken Measures: Scrapped and replaced

Inner Seal had damaged tabs that were broken

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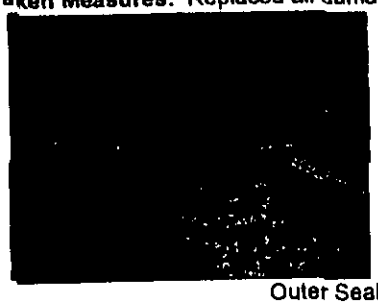
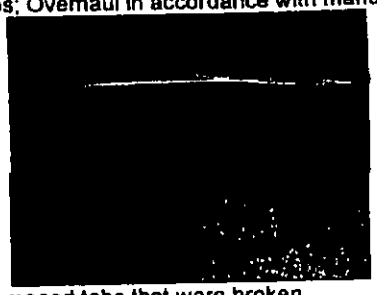
6.4 Seal HPT Stator Outer

Findings: Removed per standard practice. Damaged tabs shown below.
Taken Measures: Replaced all damaged tabs; Overhaul in accordance with manual





Outer Seal had damaged tabs that were broken

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Handling *RESTRICTED* Date 4/6/2006

Assembly of Stage One Nozzle

JOB: L 5025

ITEM	OPERATION	MIN	MAX.	ACTUAL	MECH	VERIFY
	ASSEMBLY OF STAGE ONE NOZZLE					
note	**Prior to assembly, check Work scope for all applicable Service Bulletins. Verify all new hardware has been issued**	X	X	X	X	
	Record the following:					
1	**Nomenclature Part Number Serial Number** NZL ASSY STG 1 9687M92G24 FCPFA 25D	x	x	x	JAA	
2	Trial fit a nozzle segment at each position in inner seal assembly	x	x	x	JAA	
3	Place nozzle support fwd end down inside assembled nozzle segments aligning top mark on support with trailing edge of vane # 1	x	x	x	JAA	
4	Place inner and outer seal in slots of nozzle segments	x	x	x	JAA	
5	*Use soft mallet to tap segment edges firmly against each installed* nozzle. Check that nozzle seals engage to ensure proper sealing	x	x	x	JAA	
6	Align 3 large holes in the support, with the 3 holes in nozzle, then install 64 ea (P/N 9652M72P03) bolts and nuts coated with anti-seize	x	x	x	JAA	
7	Torque hardware for runout only	60 in/lbs	70 in/lbs	x	JAA	
8	Record the 1st stage nozzle flow area	x	x	x	JAA	
9	A4 AREA 53.558	x	x	x	JAA	
10	Route to machine shop for outer edge run out	x	x	x	JAA	
11	*Verify run out* .010	x	0.02	x	JAA	
12	Torque single shank bolts to 110 - 120 in/lbs	110 in/lbs	120 in/lbs	x	JAA	
13	Install 18 air baffle segments and 3 covers on rear side of support aft flange and secure per single shank configuration	x	x	x	JAA	
NOTE	**Push baffles to OD as much as possible while torquing**					
14	Torque baffles 55-70 in/lbs	55 in/lbs	70 in/lbs	x	JAA	
15	Install the inner and outer seal rings as required	x	x	x		
16	**Final inspect assembly. Insure all sequences are completed and stamped**	x	x	x	JAA	

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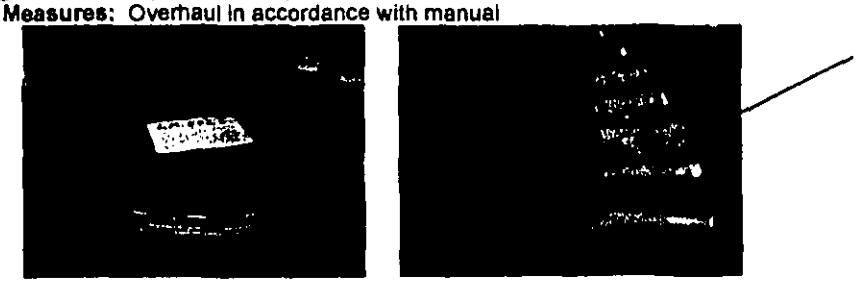
7 STAGE 2 NOZZLE

7.1 Stage 2 Nozzle Support Assembly

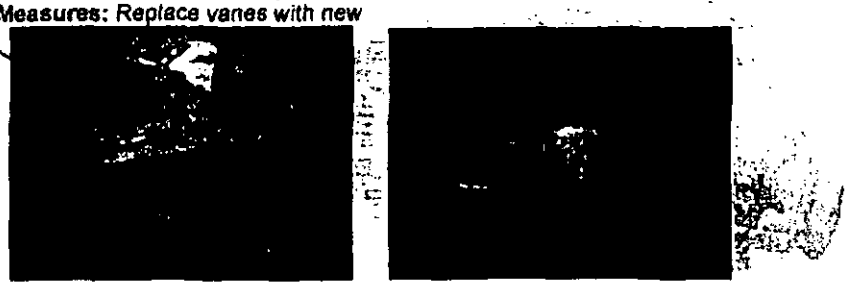
Findings: Removed per standard practice.
Taken Measures: Overhaul in accordance with manual



Stage 2 Nozzle assembly with significant damage.

7.2 Stage 2 Vanes

Findings: Removed per standard practice. Vanes had major damage.
Taken Measures: Replace vanes with new



7.3 Stage 1 Shroud Assembly HPTS

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

7.4 Stage 1 Shroud Support HPTS

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

7.5 HPT Nozzle Assembly

Findings: Scrap; needs to be replaced
Taken Measures: Replaced with new

7.6 Stationary Air Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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7.7 Stage 2 HPT Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

7.8 Shroud Support

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

7.9 Stage 2 Aft Shroud Support Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, FPI, inspected

7.10 Stage 2 HPT Shroud Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

7.11 Air Cooling Tube

Findings: Removed per standard practice, noted to be scrapped during disassembly inspection
Taken Measures: Replaced with new

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Report No. L5025 | Customer MAUI

Handling **RESTRICTED** | Date 4/6/2006

Assembly of Stage Two Nozzle

JOB: ~~L6667~~ L5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH.	VERIFY
	ASSEMBLY OF STAGE TWO NOZZLE					
1	Prior to assembly, check Workscope for all applicable Service Bulletins.	X	X	X		
2	**Record the following:**	X	X	X	X	X
2A	Nomenclature / Part Number / Serial Number N21 ASSY STG 2 9687M08G14 EVE91549 (Same as support assembly)	X	X	X		
3	Note: Verify that the nozzle segments and nozzle support are the correct configuration as required and all new hardware has been issued	X	X	X	X	X
4	Locate and mark top on aft flange of support. Mark with felt tip marking pen so tip can be easily located during assembly	X	X	X		
5	CHECK ALL THAT APPLY A (✓) P SERIES (/) C SERIES B (/) SINGLE SHANK ( ) TWIN SHANK	X	X	X		
6	Install bolts with washers under bolt heads through forward end of nozzle support and secure with nuts and torque 53 - 54 in/lbs	50 in/lbs	54 in/lbs			
7	Install blockage nuts and torque to 38 - 40 in/lbs	38 in/lbs	40 in/lbs			
8	Install stage 1 shrouds as follows	X	X	X		
A	Align slot in outer circumference of segment with shroud stop in front of nozzle support. Position groove in front edge of segment over tip inside nozzle support	X	X	X		
B	Gently tap segment forward until it seat on tip far enough to align rear groove around circumference with flange in nozzle support	X	X	X		
C	Gently tap segment outward until groove seat on flange	X	X	X		
D	Install remaining segments same manner	X	X	X		
E	Install shroud seals and check with feeler stock for presence of seals. If feeler stock goes in more than 0.375 seal is missing	X	X	X		
10	Install stage 1 shroud aft supports. Position end gaps of supports in away between end gaps of shrouds. Ensure shroud supports are seated in shrouds and nozzle support ring	X	X	X		
11	Assemble stage 2 nozzle assembly (Single Shank) using inter-stage seal P/N 9311M28G05	X	X	X		
12	Install sub head bolts and secure with new self lock nuts	X	X	X		
13	Install nozzle assembly making sure telescope nozzle segments with nozzle support	X	X	X		
14	Install stage 2 shroud forward support as follows	X	X	X		
A	Install first stage 2 seal such that tip is facing aft and third hole CW is at No. 1 vane of No. 1 nozzle segment. Install remaining seals. Do not overlap edges of seal segments	X	X	X		
B	Install first stage 2 shroud forward support over stage 2 seals such that I.D. tip is facing aft and center hole is at No. 1 vane of No. 1 nozzle segment. Install remaining seals and shroud supports	X	X	X		
C	Coat threads and washer faces of nuts with thread lubricant. Tighten nuts sufficient to seat supports	X	X	X		
D	Loosen nuts. Apply outward pressure to shroud supports while tightening nuts	X	X	X		
E	Torque nuts to 90 - 110 in/lbs	90 in/lbs	110 in/lbs			
15	NOTE: Failure to properly accomplish this step will result in inability to mate with TMF.					

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Report No L5025 Customer MAUI

Handling **RESTRICTED** Date 4/6/2006

JOB: ~~L6004~~ L5025

ITEM	OPERATION	MIN	MAX.	ACTUAL	MECH.	VERIFY
16	Assemble stage 2 shroud assembly. Position shroud stops over nos marked 5 of stage 2 shrouds and on forward side of all support. Install slab head bolts from all side with slab head facing outboard Note: Slab head is larger flat.	X	X	X		
17	Torque nuts to 33-37 in/lbs Assy #	33 in/lbs	37 in/lbs			
18	Route stage 2 nozzle Assy. For grind. L25739G13	X	X	X		
19	After grind process is completed. Install 88 cooling tubes, spring washers, and retainers. Washers must be installed with concave side facing the cooling tube	X	X	X		
27	RECORD SERVICE BULLETINS AS REQUIRED BY CUSTOMER	X	X	X		
	S/B 087 PCW ( ) C/W ( ) N/A ( )	X	X	X		
	S/B PCW ( ) C/W ( ) N/A ( )	X	X	X		
	S/B PCW ( ) C/W ( ) N/A ( )	X	X	X		
28	Final inspection	X	X	X		

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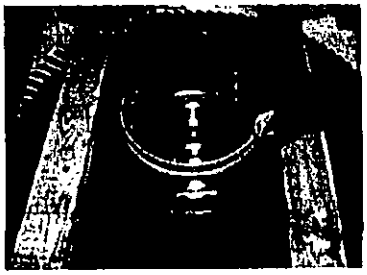
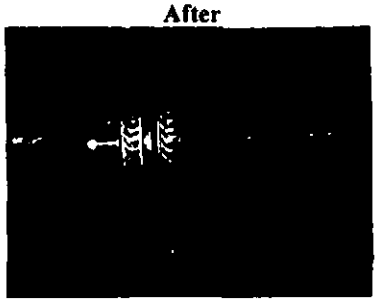
8 HIGH PRESSURE TURBINE ROTOR

Before



After



8.1 Stage 1 Blade Retainer

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, Inspect, FPI

8.2 Aft Shaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

8.3 Stage 1 Disk

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

8.4 Stage 2 Disk

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

8.5 Thermal Shield

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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8.6 Pressure Tube Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

8.7 Coupling Nut

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

8.8 Pressure Tube Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

8.9 Forward Shaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, FPI

8.10 Spacer

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, FPI, inspected.

8.11 Stage 1 Dampers

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, FPI, inspected

8.12 Stage 2 Dampers

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, FPI, inspected

8.13 Stage 2 Retainer

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, FPI, Inspect

8.14 Stage 1 Blades

Findings: Removed per standard practice. Blades had some damaged on the tips.
Taken Measures: Replaced with new

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8.15 Stage 2 Blades

Findings: Removed per standard practice. Blades had some damaged on the tips
Taken Measures: Replaced with new

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Handling RESTRICTED Date 4/6/2006

Assembly of High Power Turbine (HPT)

JOB: L5025

ITEM	FORWARD SHAFT INSTALLATION	MIN.	MAX.	ACTUAL	MECH.	VERIFY
1	P/N S/N 9028M78G11 CAUY1592			X	[illegible]	
2	Install forward shaft in disassembly fixture			X	[illegible]	
3	Coat all mating surfaces and threads with anti-seize thread tooling nut into coupling nut (item # 33) as far as possible			X	[illegible]	
4	Install coupling nut (item #33) and tube adapter (item # 32) into forward shaft, splines toward rear, torque adapter 2500-2600 ft/lb NOTE: TUBE ADAPTER HAS LEFT-HAND THREADS	2500 ft/lb	2600 ft/lb	X	[illegible]	
5	Check run out+flatness of rotary table must be .001" or less		.001"	X	[illegible]	
6	Install forward shaft in rotary table check and record Run out .005 Flatness .003		.010" .010"	X	[illegible]	
	STAGE 1 DISK INSTALLATION					
7	P/N S/N 9208M81P07 MUNAK034			X	[illegible]	
8	Find 1-1 + 5-5 stamp on disk (item #30) mark this side rear			X	[illegible]	
9	Insure all mating surfaces are cleaned and stoned cool all flange of forward shaft heat stage 1 disk			X	[illegible]	
10	Install disk with 10 slave bolts and nuts torque to 220-240 in/lb			X	[illegible]	
11	Allow part to normalize measure and record Run-out .003 Flatness .0025 POLAR CHART MAY BE REQUIRED	run-out flatness	.003 .0025	X	[illegible]	
	THERMAL SHIELD INSTALLATION					
12	P/N S/N L25734G05 PCE130753			X	[illegible]	
13	Find and mark N-stamp on thermal shield (item#10) and U stamp on spacer (item#13)			X	[illegible]	
note	DETERMINE SHIM THICKNESS AS FOLLOWS REF TO FIGURE 14.10					
14	Record shim thickness to be installed .010			X	[illegible]	
15	Install nutplates on front and rear flanges position thermal shield forward end up on table, cut and install seal ring on larger o.d. groove tape and glue in place			X	[illegible]	
16	Install spacer onto build fixture, install shims Heat forward flange of thermal shield install onto spacer assy Alighning U-mark with N-mark secure with hardware			X	[illegible]	
17	Install d-bolts (item#23) in all inner flange of spacer assy			X	[illegible]	
18	Freeze thermal shield/spacer assembly, heat stage 1 disk Secure to disk using slave hardware torque 220-240 in/lb			X	[illegible]	
19	Using .006" feeler stock check for proper seating May not be inserted to full depth		.006"	X	[illegible]	

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JOB: L 5025

20	Allow part to normalize, measure and record run-out .006 Flatness .003	run-out flatness	.006" 0035"			
21	Install hardware in stage 1 disk omitting every other bolt hole, torque bolts to 220-240 in/lb	220 in/lb	240 in/lb			
	STAGE 2 DISK INSTALLATION					
22	P/N L25YY51P06 S/N MUMAM041					
23	Find 1-1 + 5-5 stamp on disk (item #21) mark this side rear. Find J-mark stamped on forward side transfer to rear of disk					
24	Install seal ring in rear side of thermal shield,larger o d groove tape and glue in place					
25	Freeze thermal shield/spacer assembly, heat stage 2 disk					
26	Using 8 bolts equally spaced install disk aligning J mark with U and N marks on thermal shield assy secure disk torque hardware 110-120 in/lb	110 in/lb	120 in/lb			
27	Allow part to normalize,measure and record Run out .002 Flatness .0035	run-out flatness	002 0035			
28	Install 60 bolts (item#20) and washers (item#18) beginning with J mark leaving every third hole open torque bolts 110 120 in/lb	110 in/lb	120 in/lb			
29	Using .004 feeler stock check for proper seating May not be inserted to full depth					
	PRESSURE TUBE INSTALLATION					
30	Install shim (item#31) onto pressure tube adapter, install bolts (item#14) with push on nuts (item#24), insure stab heads are locked and seated in position					
31	Lubricate threads and mating surfaces with anti-seize Install and torque pressure tube (item#29) to 900 ft/lb continue torque until lines on tooling are aligned to facilitate aft shaft	900 ft/lb	1300 ft/lb			
	AFT SHAFT INSTALLATION					
32	P/N L31304 A08 S/N APV03586					
33	Install gasket (item#28) in groove of aft shaft (item#25), tape and glue in place					
34	Heat aft shaft chill disk install shaft aligning inner and outer studs install nuts and torque using a cross-cross torque pattern and a dial torque wrench 1240-1260 in/lb	1240 in/lb	1260 in/lb			
35	Apply final torque as follows Loosen nuts installed in previous step re-torque using same torque pattern 850-1350 in/lb Check for proper seating with .001" feeler stock					
36	Install inner nuts torque to 40-50 in/lb insure studs did not spin	40 in/lb	50 in/lb			
37	Measure and record radial run-out of #5 journal Run-out .001		.002"			
	PRE-BALANCE OF H.P.T.R.					
38	Heat # 5 balance bearing install on shaft remove rotor from fixture put in horizontal transport stand					

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JOB: L 5025

39	Install stage 1 and stage 2 blades with damper seals					
40	Install stage 1 blade retainer using 4 equally spaced bolts for pre-balance mark location of bolts to shaft,match mark retainer to shaft to ensure same location during balance					
41	**NOTE:DO NOT INSTALL SEALS ON BLADE RETAINERS AT THIS TIME.**					
42	Install stage 2 blade retainer using 8 bolts evenly spaced mark location of bolts to shaft,match mark retainer to shaft					
43	Install rotor in balance machine Measure and record run-out of # 5 journal Run out---------- .001		.002"			
44	Perform pre-balance of rotor per OEM by swapping blades as needed Print balance report!!!!!!					
45	Remove rotor from machine.Install in grind machine					
46	**CONTACT INSPECTION FOR TIP GRINDING MEASUREMENTS.** Record final dimesion to be obtained Stage 1 16.580 Stage 2 17.235					
47	Install shims between blades, grind rotor until each blade is coming in contact with wheel fully across blade **CONTACT INPECTION FOR MEASUREMENT.**					
48	Finish grinding rotor to dimensions above,de burr and clean ALL metal from cooling holes of blades and rotor assy FINAL INSPECT DIMENSIONS					
49	Remove stage 1 blade retainer, cut and glue 2 seal rings in lager o d grooves Install retainer tourque bolts 220-240 in/lbs	220 in/lb	240 in/lb			
50	Perform final blance of rotor per OEM Install check weight to insure proper calibration of machine PRINT REPORT !!!!!!!!!					
51	Remove from balance machine,remove balance bearing,clean and wrap					
52	Remove stage 2 blade retainer, cut and glue seal ring in larger o d groove Install retainer,bolts with washers torque to 85-90 in/lb	85 in/lb	90 in/lb			
53	FINAL INSPECT ASSEMBLY					

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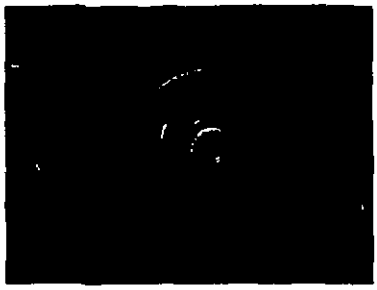
9 TURBINE MID-FRAME SECTION

9.1 Turbine Mid-Frame Assembly

Findings: Removed per standard practice; Drain tube was bent.
Taken Measures: Overhaul in accordance with manual



9.2 No. 5 Bearing Damper

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

9.3 No. 5 Bearing Stationary Air-Oil Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

9.4 Insulation Blanket Forward C Sump

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

9.5 No. 5 Bearing Heat Shield

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

9.6 Cooling and Vent Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

9.7 No. 6R Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

9.8 Stage 1 LPT Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

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9.9 LPT Stationary Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

9.10 No. 5 Bearing Inner Nut

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

9.11 Stationary-Vent No. 6 Bearing Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

9.12 #6 Bearing Stationary Air-Oil Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

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Assembly of Turbine Mid Frame

JOB: L 5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	ASSEMBLY OF TURBINE MID FRAME					
1	Prior to assembly, check Workscope for all applicable Service Bulletins	X	X	X		
2	Record the following:	X	X	X		X
	Nomenclature Part Number Serial Number					
2A	MID FRAME ASSY L2V2B3G41 FCPFA9110	X	X	X		
	NO 5 BEARING L31720P01 MR1DM679					
3	Note: Remove all protective caps & closures from tube oil and vent tubes. Blow out all tubes with dry, filtered shop air from inside frame outward	X	X	X		
4	VERIFY Mid frame has been pressure leaked (TBS) (TAU)	X	X	X		
	NO 5 Bearing Installation					
6	Install alignment pins in # 5 bearing mounting flange	X	X	X		
7	NOTE No 5 bearing and inner race are a matched set having the same serial number. They shall be maintained as a set. No 5 bearing lock plate has two configurations. Improved 30 fingers must be used with improve 30 slots. Do not use old style lock plate & tabs with improved bearing or old style bearing with improved lock plate	X	X	X		
8	Install bearing from forward side with lugs on bearing facing forward. Install brg lock plate engaging lugs on bearing	X	X	X		
9	Ensure piston rings are used if it is a damper bearing	X	X	X		
9	Install bolts. Tighten bolts to 60 - 70 in/lbs and safety wire	60 in/lbs	70 in/lbs	X		
10	Install the # 5 brg. Air and Oil seal	X	X	X		
11	Ensure Pin is installed on flange of oil seal	X	X	X		
	NOTE: Damper type uses Tex Packing on oil seal. Non Damper type uses Jea Packings on oil seal	X	X	X	X	X
12	NOTE: Before runout future is installed insert dial. Placed of equal size shim stock between bearing and housing from all side of frame (Approx .005" feeler gage stock.)	X	X	X		
	Take run out of the # 5 brg. Air and oil seals . 0015	X	X	X		
	Record measurements 0216 0201	X	X	X		
13	Install insulation blanket and reinstalled over carbon seal using 22ea. bolts	X	X	X		
	Torque bolts to 33 - 37 in/lbs	X	X	X		
14	Install alignment pins in all cooling and vent tube mounting flange	X	X	X		

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JOB: L5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
15	Heat forward air cooling and vent seal. Install seal on TMF, make certain air tubes are aligned with holes in TMF.	X	X	X	[illegible]	
16	Secure with 40ea. Bolts and torque to 55 - 70 in/lbs	55 in/lbs	70 in/lbs	X	[illegible]	
17	Take run out of the Forward vent seal .0045	X	X	X	[illegible]	
18	Record measurements C29F 11.102	X	X	X	[illegible]	
19	Take measurements of the seals	X	X	X	[illegible]	
	Record measurements as follows	X	X	X	[illegible]	
	Min Dia W2 Min Radius C21F 3.047	X	X	X	[illegible]	
	Min Dia W8 Min Radius C29F 5.548	X	X	X	[illegible]	
	Minimum radius + Minimum diameter FIR DIVIDED BY 2	X	X	X	[illegible]	
20	Measure drop dimension from parallel bar to TMF forward flange face and record as Dimension A. 1.503	X	X	X	[illegible]	
21	Measure four equally spaced drop dimensions from parallel bar to locations listed below.	X	X	X	[illegible]	
	INNER LINER H55F 1.017	X	X	X	[illegible]	
	FORWARD VENT SEAL C56F 1.579	X	X	X	[illegible]	
	FWD A/O SEAL #5 BRG C40F 3.581	X	X	X	[illegible]	
22	Install setscrews so tips are flush with forward side of flange	X	X	X	[illegible]	
23	Install the #5 oil nozzle and gasket aligned with proper size holes and secure with two bolts	X	X	X	[illegible]	
	SMALL BOLT (R1393P003L) TORQUE.	33 in/lbs	37 in/lbs	X	[illegible]	
	LARGER BOLT (R1394P003L) TORQUE	55 in/lbs	70 in/lbs	X	[illegible]	
	P SERIES ONLY					
24	Install #6 bearing and secure with 12ea. Bolts	X	X	X	[illegible]	[illegible]
	Torque bolts to 60 - 70 in/lbs. And safety wire	60 in/lbs	70 in/lbs	X	[illegible]	[illegible]
25	Accomplish an impingement check of the oil nozzle	X	X	X	[illegible]	

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RESTRICTED Date 4/6/2006

26	Accomplish a flow check			X		
28	Final Inspection	X	X	X		

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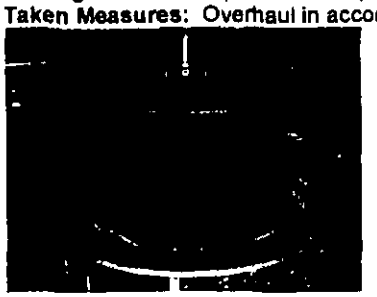
10 LOW PRESSURE TURBINE

10.1 Power Turbine Rotor

Findings: *Removed per standard practice without major visual findings*
Taken Measures: Overhaul in accordance with manual

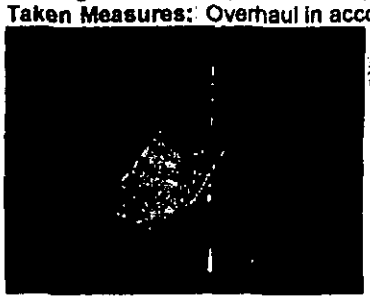


10.2 Aft Shaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

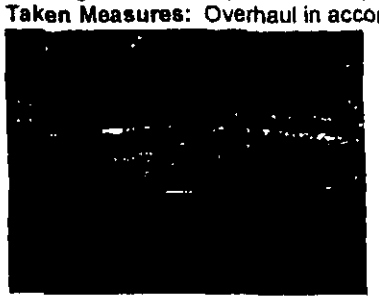
10.3 Front Shaft

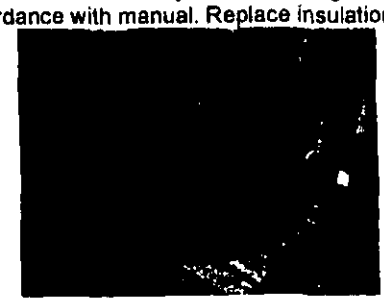
Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual



10.4 Power Turbine Stator Cases

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual. Replace insulation blankets





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10.5 LPT Blades

Findings: Removed per standard practice. Several blades were dispositioned scrapped during inspection

Taken Measures: Overhaul in accordance with manual. Qty. 18 blades stage 1; Qty.6 blades stage 2 and Qty. 20 blades stage 3 were scrapped and replaced.

10.6 LPT Shrouds

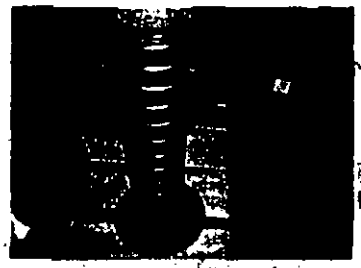
Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

10.7 LPT Seals

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

10.8 LPT Shield

Findings: Removed per standard practice; tube was dispositioned to be scrapped during inspection.
Taken Measures: Scrapped and Replaced



10.9 LPT Disks

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, inspect, serviceable

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Handling RESTRICTED | Date 4/6/2006

Assembly of Low Pressure Turbine

JOB: LPTR L5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH.	VERIFY
	ASSEMBLY OF LOW PRESSURE TURBINE ROTOR					
1	Prior to assembly, check Workscope for all applicable Service Bulletins.	X	X	X		
2	Record the following:	X	X	X	X	X
2A	Nomenclature / Part Number / Serial Number Rotor, LP Turbine L1LLS2Fd F1A CC8-1k (Same as all shaft assembly)	X	X	X		
	Assembly of LPT Rotor Disks					
3	Note: Install blades, with leading edge away from cone shape of Disk	X	X	X	X	X
4	Stage 1 Install blades into Disk	X	X	X		
5	Static balance bladed stg 1 Disk and seal	X	X	X		
6	Record Final Imbalance Amount 1.6 Angle 90 (max 1.2 grams)	X	X	X		
7	Install blade retainers	X	X	X		
8	*Note: install stg 2 blade retainers w/blade Stage 2 Install blades into Disk	X	X	X		
9	Static balance bladed stg 2 Disk and seal	X	X	X		
10	Record Final imbalance. Amount .4 Angle 128 (max 1.2 grams)	X	X	X		
11	Install blade retainers	X	X	X		
12	Stage 3 Install blades into Disk	X	X	X		
13	Static balance bladed stg 3 Disk and seal	X	X	X		
14	Record Final Imbalance Amount 1.0 Angle 253 (max 1.3 grams)	X	X	X		
15	Install blade retainers	X	X	X		
16	Stage 4 Install blades into Disk	X	X	X		
17	Static balance bladed stg 4 Disk and seal	X	X	X		
18	Record Final imbalance. Amount 1.2 Angle 347 (max 1.3 grams)	X	X	X		
19	Install blade retainers	X	X	X		
20	Stage 5 Install blades into Disk	X	X	X		

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21	Static balance bladed stg 5 Disk and seal	x	x	x		
22	Record Final imbalance Amount 1.4 Angle 120 (max 1.4 grams)	x	x	x		
23	Install blade retainers	x	x	x		
24	Stage 6 Install blades into Disk.	x	x	x		
25	Static balance bladed stg 6 Disk and seal	x	x	x		
26	Record Final imbalance Amount 8 Angle 70 (max 1.4 grams)	x	x	x		
27	Install blade retainers	x	x	x		
	Assembly of Low Pressure Turbine Rotor					
28	Install stg 1 Disk, with seal down and bolt holes aft onto build up fixture.	x	x	x		
29	Place stg 2 seal on aft side of stg 1 disk	x	x	x		
30	Install stg 2 Disk, with cone shape (of Disk) aft on aft side of stg 2 seal and align bolt hole and match marks (made during balancing)	x	x	x		
31	Install the 60ea Slab headed bolts with nuts and torque to 95in/lbs 105in/lbs	95in/lb	105in/lb	x		
32	Place the stg 3 seal on aft side of stg 2 disk and align bolt holes	x	x	x		
33	Install the 60ea Slab Headed bolts and push on nuts	x	x	x		
34	Install the Rotating vent seal, air seal and plug onto the forward shaft	x	x	x		
35	Install forward shaft onto stage 2 disk	x	x	x		
36	Install the stg 3 disk onto forward shaft, align bolts and install nuts. Torque nuts to 95 - 105 in/lbs	95in/lb	105in/lb	x		
37	Install the stg 4 seal on aft side of stg 3 disk aligning bolt holes. Secure with the slab-headed bolts	x	x	x		
38	Install the stg 4 disk onto the stg 3 disk using 60 slab-headed bolts and torque to 95 - 105 in/lbs	95in/lb	105in/lb	x		
39	Install the stg 5 seal onto stg 4 disk and align bolt holes	x	x	x		
40	Install stg 5 disk by aligning holes and using bolt-headed bolts. Torque to 95 - 105 in/lbs	95in/lb	105in/lb	x		
41	Secure shield, rotating vent seal and rotating air seal to forward shaft using the 15ea Self locking nut and bolts. Torque to 33 - 37 in/lbs	33in/lb	37in/lb	x		

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42	Install slab headed bolts and push on nuts into stg 5 disk aft flange			X		
43	Install 24ea. Slab headed bolts and push on nuts through aft shaft at the rotating balance piston seal assembly mating flange	X	X	X		
44	Install aft shaft over slab-headed bolts. Then, install the stg 6 seal, disk and self locking nuts. Torque nuts to 95 - 105 in/lbs	95in/lb	105in/lb	X		
45	Install the rotating balance piston seal assembly, with self locking nuts torqued to 95 - 105 in/lbs.	X	X	X		
46	Dynamic balance of LP Rotor. If imbalance exceeds 103 gr. (800 gmin.) in both planes, rotor must be rebuilt	X	X	X		
47	LEFT ANGLE ~~-612~~ 19.3 RIGHT ANGLE ~~1.32~~ 48.4	X	X	X		
48	Final balance of LPT rotor	X	X	X		
49	LEFT ANGLE .612 RIGHT ANGLE 1.32	X	X	X		
51	Final Inspection	X	X	X		

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JOB:

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	ASSEMBLY OF LPT STATOR CASES					
1	Prior to assembly, check Workscope for all applicable Service Bulletins.	X	X	X	[illegible]	
2	Record the following	X	X	X	X	X
2A	Nomenclature Part Number Serial Number STATOR CASE, LOWER 1815H1BG04 GEUR2516 STATOR CASE, UPPER 1815H1BG04 GEUR2516	X	X	X	[illegible]	[illegible]
	Installation of LPT. Vane Segments					
4	Install all Nozzle Forks holding square with fwd. Surface of Casing runners and torque 55 - 70 in lbs	55in/lbs	70in/lbs	X	[illegible]	
5	Install Shroud Insulator Blankets at stages 1 2 3 & 4	X	X	X	[illegible]	
	Note Ensure stage 1 insulators for S/B 000 ARE USED ON THICK FLANGE CASES	X	X	X	X	X
6	Install Nozzle Insulator Blankets at stages 2,3, & 4	X	X	X	[illegible]	
	Note Install Insulator Covers, Nozzle Segments, Shroud Segments and Seal Strips according to the Position Sequence Guide in Fig. 22 4	X	X	X	[illegible]	
7	Install stg 1 insulator cover, shrouds and seal strip	X	X	X	[illegible]	
8	Install stg 2 nozzles and sealing strips	X	X	X	[illegible]	
	Note Ensure male and female are installed in the correct position	X	X	X	X	X
9	Install the stg 2 shrouds and seal strips	X	X	X	[illegible]	
10	Install the stg 3 nozzles and sealing strips	X	X	X	[illegible]	
11	Install the stg 3 shrouds and seal strips	X	X	X	[illegible]	
12	Install the st 4 nozzles and shrouds.	X	X	X	[illegible]	
13	Install the stg 5 nozzles and shrouds	X	X	X	[illegible]	
14	Install the stg 6 nozzles and shrouds	X	X	X	[illegible]	
15	Install 2nd stage Interstage Seals, Spacers and Seal strips	X	X	X	[illegible]	
16	Install 3rd stage Interstage Seals and Seal Strips	X	X	X	[illegible]	
17	Install 4th Stage Interstage seals	X	X	X	[illegible]	
18	Install 5th Stage Interstage Seals	X	X	X	[illegible]	
19	Install 6th Stage Interstage Seals	X	X	X	[illegible]	

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JOB:

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH.	VERIFY
28	Final Inspection	X	X	X		

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11 TURBINE REAR FRAME

11.1 Turbine Rear Frame Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

11.2 No. 7R Bearing

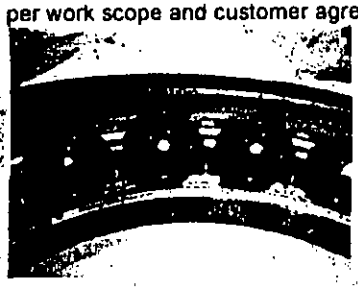
Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

11.3 No. 7B Bearing Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, NDT, FPI

11.4 No. 7B Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement



11.5 No. 7 Bearing Forward Stationary Oil Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

11.6 Forward Stationary Air Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

11.7 Stationary Air Seal Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

11.8 Forward Stationary Air Balance Piston Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

11.9 No. 7 Bearing Rotating Nut

Findings: *Removed per standard practice without major visual findings*
Taken Measures: Overhaul in accordance with manual

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11.10 No. 7 Bearing Nut

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

Assembly of the Turbine Rear Frame

JOB: L5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH.	VERIFY
1	ASSEMBLY OF TURBINE REAR FRAME					
	Prior to assembly, check Workscope for an applicable Service Bulletins.					
2	Record the following:					
2A	Nomenclature / Part Number / Serial Number Turbine Rear Frame L474Ø76Ø1 FIA Ø5ØØ4Ø No 7 Bearing L1691PØ3 MRCP7852	x	x	x	TBO	
3	PCW on Overhaul Note: Verify that the "TRF" has been pressure tested	x	x	x	TBO	
	Assembly of the Turbine Rear Frame:					
4	Install "TRF" in assembly stand remove protective caps and covers Ensure lube and vent tubes are clear	x	x	x	TBO	
5	Using shop air blow out all tubes, from the inside frame outboard	x	x	x	TBO	
6	Measure and Record Dimension A (Forward Flange thickness)	x	2.713"	2.708	TBO	
7	Install No 7B Bearing and deflector into housing and torque bolts to 100 - 130 in/lbs (# 7 Brg is a matched set)	100in/lb	130in/lb	100	TBO	
8	Measure and Record Dimension B (Forward Flange TRF to No 7 bearing housing)	x	4.620"	4.625	TBO	
9	Install No 7B Bearing housing using 2oz. Packings (9007M35x16)	x	x	x	TBO	
10	Install forward oil seal using 2oz. Packings (p221x11 lbs) and torque to 55 - 70 in/lbs	55in/lb	70in/lb	55	TBO	
11	Note: Bolts to be wire - locked in groups of four	x	x	x	TBO	
12	Calculate Dimension C = (A+B) 7.358	7.330"	7.350"	7.358	TBO	
13	Measure and record runouts of seals 615B = FIR 10.097 DIA 5.001 MIN RAD .002	x	x	x		
14	Install fwd. Low pressure stationary seal and torque 55 - 70 in/lbs	55in/lb	70in/lb	55	TBO	
15	Measure and record runouts of seals 615F = FIR 10.135 DIA 5.067 MIN RAD .002	x	x	x		
16	Install fwd. piston balance seal and torque 55 - 70 in/lbs	55in/lb	70in/lb	X		
17	Measure and record runouts of seals 603F = FIR 12.101 DIA 8.202 MIN RAD .001	x	x	X		
18	Wire lock balance seal bolts in groups of four	x	x	x		
19	Install forward stationary air seal and torque bolts 55 - 70 in/lbs	55in/lb	70in/lb	x		
20	Measure and record runouts of seals 603B = FIR 11.816 DIA 5.202 MIN RAD .001	x	x	x		

ASSY 615 A | 7/30/06 15:01 [illegible] | 1 of 2

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	Note Power Turbine Assy L25190G01 - G14 is referred to as Configuration 1 Power Turbine Assy L25190G15 is referred to as Configuration 2. Configuration 2 is maintained without a ring spacer.	x	x	x	x	x
21	Install ring spacer if required using one new gasket under spacer. Do not install a gasket between spacer and seal at this time. It will be installed at final assembly	x	x	x		
22	Install aft stationary oil seal	x	x	x		
23	Measure and record runouts of seals 632F = 7.02 DIA 3.808 MIN RAD .001 FIR	x	x	x		
24	Install aft stationary air seal and torque bolts to 55 - 70 in/lbs	55in/lb	70in/lb	X		
25	Measure and record runouts of seals 635F = 7.568 DIA 3.793 MIN RAD .002 FIR	x	x	x		
28	Final Inspection	x	x	x		

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12 ACCESSORY GEARBOX – TRANSFER GEARBOX

12.1 Gearbox Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.2 Air/Oil Separator Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.3 Air/Oil Separator Impeller Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.4 Air/Oil Separator Impeller Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, clean, inspect, recoat and replace Teflon seal

12.5 Oil and Scavenge Pump

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

12.6 Radial Drive Shaft Bushing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

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12.7 Radial Drive Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.8 Retainer Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.9 Duplex Bearing (Thrust)

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

12.10 Duplex Bearing Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.11 Roller Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Replaced with new per work scope and customer agreement

12.12 Bearing Retainer

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.13 Roller Bearing Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.14 Gearshaft 45 Tooth Bevel

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.15 Bevel and Accessory Gear Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.16 Bearing Retainer

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.17 Horizontal Drive Shaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

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12.18 Horizontal Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.19 Duplex Ball Bearing Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.20 Idler Adapter Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.21 Annular Ball Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

12.22 77 Tooth Spur Gearshaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.23 Air/Oil Separator Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.24 Cover Plate

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.25 Ball Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

12.26 Housing Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.27 Retainer Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.28 Main Fuel Pump Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

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12.29 Starter Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.30 Retainer Seal Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

12.31 Manual Drive Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

12.32 Ignitor Plug Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

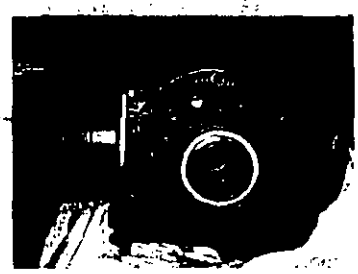
12.33 Starter Adapter

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

13 INLET GEARBOX

13.1 Inlet Gearbox Housing Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect



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13.2 Bevel Gear Housing Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

13.3 Accessory Gear Housing Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

13.4 IGB Horizontal Gearshaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

13.5 Adapter Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

13.6 Gearshaft Bearing Housing

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

13.7 Nozzle Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

13.8 Retainer

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

13.9 Support

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

13.10 Nozzle

Findings: Removed per standard practice without major visual findings
Taken Measures: Strip, Recoat, Clean, Inspect

13.11 Seal Assembly

Findings: Scrap and Replace
Taken Measures: Replace

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14 FINAL ASSEMBLY

14.1 No. 3R Inner Race Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

14.2 No. 4R Bearing Aft Stationary Air Seal

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

14.3 No. 4 Bearing Spline Split Plain Nut

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

14.4 Collar Split Nut

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect, Serviceable

14.5 Retainer Split Nut

Findings: Scrap and Replace; Bent and Eroded
Taken Measures: Replace

14.6 Compressor Rear Frame Baffle

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, Clean, Inspect

14.7 CRF Seal Support

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, Clean, FPI

14.8 Oil Cap Tube Assembly

Findings: Removed per standard practice without major visual findings
Taken Measures: Glass bead, Clean, FPI

14.9 No. 5R Inner Race Bearing

Findings: Removed per standard practice without major visual findings
Taken Measures: Overhaul in accordance with manual

14.10 Expandable Bushing Assembly

Findings: Scrap and Replace; Broken
Taken Measures: Replaced

14.11 Radial Drive Shaft

Findings: Removed per standard practice without major visual findings
Taken Measures: Clean, Inspect

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Engine Final Assembly

JOB:

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	ENGINE FINAL ASSEMBLY					
1	**Prior to assembly, check Workscope for all applicable Service Bulletins**	X	X	X		
2	**Record the following:**	X	X	X	X	
2A	Nomenclature Part Number Serial Number #3 BRG I/R 195H1F01 T13C1A3Y	X	X	X		
3	Install compressor front frame on vertical assembly stand	X	X	X		
4	Install the No. 3 Bearing inner race and run spanner nut onto rotor front shaft as far as possible by hand	X	X	X		
	Place center tube of spanner wrench 2C6001 into shaft and engage outer splines in shaft. Position spanner wrench over spanner nut so lugs of wrench engage slots in nut	X	X	X		
	Install torque multiplier (0 - 10,000 ft/lbs). Install spanner plate on top of torque multiplier and secure with knurled knob. Tighten spanner nut to 950 - 1050 ft/lbs. After race has cooled, then loosen and retighten to 450 - 500 ft/lbs. Of torque (Minimum amount) to permit alignment of slots for acceptance of retainer ring	X	X	X		
	Torque spanner/nut to 450 - 500 ft/lbs	450 ft/lbs	500 ft/lbs	X		
	Remove spanner wrench from nut, and check seating of bearing race by using 0.001 inch thick shim stock as a feeler gage around the entire circumference of race. Shim must not enter any gap	X	X	X		
	Secure spanner nut with keyed retaining ring, ring spacer and retaining ring. Make certain that retaining ring is fully seated in groove of spanner nut	X	X	X		
5	**Install the compressor rotor into the front frame as follows:**					
	Check that the S/N of No 3 bearing inner race on compressor rotor front shaft is identical to serial number of No. 3 bearing outer race in CFF	X	X	X		
	Insert pilot guide splined end first into forward end of compressor rotor. Align splines of pilot guide with internal splines of compressor rotor and ensure guide is fully seated	X	X	X		
	Apply a thin coating of assembly fluid to No. 3 bearing rollers and inner race	X	X	X		
	Slowly lower rotor until pilot guide in rotor engages guide at center of vertical maintenance stand 1C6883	X	X	X		
	Continue to lower rotor until rotating air seal contacts stationary air seal of frame. Simultaneously, lower hoist and guide to lower rotor	X	X	X		
	Assemble No. 4 Bearing as follows:					
6	Perform Steps Q 1 - 5, measurement of compressor rotor aft seals and races. Insure that serial numbers on bearing inner races and bearing assembly are identical.	X	X	X		
7	Q1 Measurement dimension Z ..... 14.172 Q4 High point of stack Dim. A ..... 8.998 Q5 Subtract Dim. A from Dim. Z 5.174	X	X	X		
8	Heat FWD retaining seal and #4 roller bearing inner race @ 300°F for 20 minutes.	X	X	X		
8A	Install FWD retaining air seal	X	X	X		

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JOB:

ITEM	OPERATION	MIN.	MAX.	ACTUAL	MECH	VERIFY
8B	Install #4 rotor bearing inner race	X	X	X		
9	**Record Drop Check measurement per Step G:**					
	Dim. B51M forward edge of outer tooth CDP seal	X	X	X		
	B51M 6.6.2	X	X	X		
	Dim. B50M face of 16th stage disk just outboard of CDP seal	X	X	X		
	B50M 7.185	X	X	X		
10	**Installation of Compressor Rear Frame:**					
	Calculate clearances using dimensional data from CRF and preceding step	X	X	X		
	A) CDP Seal tooth engagement	X	X	X		
	B51 = B50F - B51M - 0.010"	0.025"	0.057"	.048		
	B) If clearance B51 is not within limits, comply fully with step 2	X	X	X		
	B51 = B50F + Spacer - B51M - 0.010"	X	X	X		
	C) 16th stage disk to CDP Stationary seal	X	X	X		
	B50 = B50M - B50F - Spacer thickness - 0.010"	0.350"	X	.355		
11	NOTE: If clearance B51 is within limits, omit steps B through E. Perform steps B through E if required (see not above)	X	X	X		
12	Install the CRF. Insure 12 o'clock position on frame is aligned with top vertical centerline of gas generator.	X	X	X		
13	Insure that clearance between aft faces of 16th stage blade platform and forward of vane shelf is .057" - .093"	.057"	.093"	X		
14	Install upper and lower stator cases	X	X	X		
14A	Put hylomar in split line before mating cases together	X	X	X		
15	Nomenclature / Part Number / Serial Number TOP CASE SEE HPC5-F ASSY LOWER CASE SEE HPC5-R ASSY	X	X	X		
16	Install the # 4 Bearing FWD Inner Race Bearing housing with Zee Packings (9607M05T40). Ball cage assy. And the No. 4B bearing aft inner race	X	X	X		
17	Accomplish a drop check on the aft No. 4 Ball Bearing Inner Race to ensure that race is seated	X	X	X		

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Report No L5025 | Customer MAUI

Handling **RESTRICTED** | Date 4/6/2006

JOB:

ITEM	OPERATION	MIN	MAX	ACTUAL	INIT	VERIFY
18	Install No. 4H Bearing aft stationary oil seal using 2ea Packings (9607MU3H41).	X	X	X		
19	Install No. 4 Rotating AirKal Seal	X	X	X		
20	Verify aft insulation blankets have been installed	X	X	X		
21	Install No. 4 bearing AFT stationary air seal & Air heat shield. Using 20ea bolts then torque to 55-70 in/lbs. And safetywire per steps AD thru AH	55INVLBS	70INVLBS	X		
22	Remove protective covering from CRF & FWD vent seal. Ensure piston rings have been installed on forward vent seal. (4ea.)	X	X	X		
23	Install the NO 4 outer stationary air seal assy. (rear vent seal) per steps AJ & AK	X	X	X		
24	Install aft rotating air seal per step AL & AM	X	X	X		
25	Perform Step AN measurement of dimension L. Actual Dim L must equal computed dimension L WITHIN + .002 to - .001 CALCULATED--- 8.474 ACTUAL--- 8.476 DIFFERENCE--- +.002	X	X	X		
26	INSTALLATION OF #4 SPLIT NUT PER PARA. 18.2.1.4 PERFORM STEPS A THRU B, CHECK SPLIT NUT HEIGHT AND CALCULATE SEATING DIMENSION "N" RECORD DIMENSION "M" 7.222 Height (Calculate DIM. "N" by subtracting dim. "M" from the actual DIM "L" Record difference as calculated Dimension "N"---(M L) N = 1.215	X	X	X		
27	PERFORM STEPS J THRU P; TAKE RUNOUTS & RECORD USING CHARTS IN FIG 18-11 & 18-13 SURFACE "SD"--- Mark low spot (MATING FACE) DIAMETER "BM"--- Mark high spot (pilot journal)	X	X	X		
28	PERFORM STEPS Q THRU U, TORQUING OF THE NO 4 SPLIT NUT FINAL TORQUE--- 6500 ---lbs. DIM N TO BE .014 TO .022 LARGER THAN CALCULATED DIM. N CALCULATED N ".215 ACTUAL--- STRETCH--- .014 4.729	.014"	.022"	X		
29	PERFORM RUNOUT, SURFACE SD ---- Shall equal runout prior to torque within .0005" AND LOW SPOT SHALL NOT CHANGE BY MORE THAN 60 DEGREES (MATING FACE) PER STEP V THRU AD	X	X	X		
30	RUNOUT OF DIAMETER BM---, RUNOUT CHANGE BEFORE & after torque shall be equal within .001" & low spot shall not change by more than 60 deg (Pilot Journal) PER STEP V THRU AD	X	X	X		
31	INSTALL SPLINED LOCKING RING TO COLLAR PER STEP AC	X	X	X		
32	(a) REMOVE ALL TAPE COVERINGS (b) INSTALL STATIC PRESSURE BALANCE SEAL, ENSURING THE SEAL NOTCH ALINGS WITH CRF 12 OCLOCK POSITION & INSTALL 40PA BOLTS & TORQUE TO 120-130 IN/LBS PER STEP AH TO AI	X	X	X		
33	A) VERIFY IF STEAM BAFFLES ARE REQUIRED YES ( ) NO (X) B) IF YES, THEN INSTALL PER S/B 074 C) TORQUE THE BAFFLE COVERS TO 55--70 IN/LBS NOTE: MOVE BAFFLE COVERS AS FAR INWARD AS POSSIBLE, BEFORE TIGHTING BOLTS ALLOW ENOUGH CLEARENCE BETWEEN COVER OUTER EDGE AND THE CRF INNER WALL	55IN/LBS	70IN/LBS	X		
34	INSTALL THE STG 1 HPT NOZZLE PER PARA 18.2.1.10.	X	X	X		
35	PERFORM STEP A INSPECT THE OUTER AND INNER FISHMOUTH SEALS MUST BE .070" ALL THE WAY AROUND USE SHIM STOCK TO CHECK	X	.070"	X		

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JOB:

ITEM	OPERATION	MIN.	MAX	ACTUAL	MECH.	VERIFY
36	PERFORM STEPS B THRU G ENSURE THAT THE NOZZLE SEALS ENGAGE COMBUSTION SEALS	X	X	X		
37	PERFORM STEP H (ref fig 18-36) ENSURE THAT SEALS ARE COMPLETELY ENGAGED IN COMBUSTION NOTE INSURE FORWARD END OF BAFFLE LINER FITS INSIDE OF BAFFLE PROTRUDING FROM PRESSURE BALANCE AIR SEAL	X	X	X		
38	INSTALL BAFFLE LINER, USING 66 EA BOLTS, THEN TORQUE TO 55-70 IN/LBS	X	X	X		
39	A) INSTALL THE CRF SUPPORT WITH 38 EA BOLTS & NUTS, THEN TORQUE TO 235 250 IN/lbs B) INSTALL BOLT COVER WITH 72 BOLTS TORQUED TO 55 70 IN/lbs PER STEP K NOTE ENSURE S/B-111 IS COMPLIED WITH IF REQUESTED	55IN/LBS	70IN/LBS	X		
40	ENSURE THAT THE UNBALANCE MARKS ((DYKEM) ARE 180 DEGREES OPPOSITE WHEN INSTALLING THE HPC & HPT ROTORS	X	X	X		
41	INSTALL HPT ROTOR PER PARA. 18-2 1.11 & FIG.18 39 PERFORM DROP DIMENSION CHECKS PER STEP B. B1) MEASURE DROP DIMENSION A FROM REAR FACE OF HPCR SHAFT TO REAR FACE OF HPT ROTOR SEATING SURFACE & RECORD AS DIMENSION A ——————. B2) MEASURE DROP DIMENSION FROM COMPRESSOR ROTOR REAR SHAFT TO REAR FACE OF SPLIT NUT COLLAR RECORD —————— B3) SUBTRACT DIM A FROM MEASUREMENT TAKEN IN STEP B2 & RECORD ——————(1.756" MIN) B4) MEASURE DROP DIMENSION FROM REAR FACE OF HPCR REAR SHAFT TO THE REAR FACE OF REAR STEP OF FWD PRESSURE BALANCE SEAL & RECORD —————— SUBTRACT SMALLEST DIM FROM DIM A, AND RECORD IT AS B75M ——————	BLEND TOOL X	LOC. FPJ X	WRONG FROM AL X		
42	PERFORM STEP C: OBTAIN DIMENSION B75F FROM HPT ROTOR SUB ASSEMBLY, THEN CALCULATE THE AXIAL CLEARANCE B75 (B75=B75F B75M) B75——————(.215" min)	X	X	X		
43	PERFORM STEP K. INSTALL PRESURHE LOCK SEAL 13 (FIGURE 18 38 INTO RECESS INSIDE THE COMPRESSOR ROTOR REAR SHAFT	X	X	X		
44	PERFORM STEP E REMOVING STG 2 BLADES. NOTE, ENSURE NO 1 (STG. 2) BLADE IS LOCATED ON 1-1 MARK ENSURE NO 5 (STG 2) BLADE IS LOCATED ON 5-5 MARK A) CONTINUE TO MARK BLADES AND DAMPER SEALS IN A CLOCKWISE DIRECTION B) REMOVE THE STAGE 2 BLADES	X	X	X		
45	PERFORM STEPS G THUR AA; INSTALLATION OF TURBINE AND TORQUING OF COUPLING NUT RECORD FINAL WRENCH ANGLE AT ——————(28 30deg)	X	X	X		
46	PERFORM STEP AD. TAKE RUNOUT OF NO 5 BEARING INNER RACE & RECORD MAX RUNOUT .005"—————— OPTIMUM RUNOUT .003" FIR	X	.005"	X	JAA	
47	HPT ROTOR OIL TUBE & NO 5 BEARING SPANNER NUT INSTALLATION PER PARA 18-2 1.12.	X	X	X		
48	PERFORM STEPS A THUR O INSTALL DAMPER SLEEVE, OIL TUBE, 2 EA PISTON RINGS & 1 ea PACKING & KEEPER RING TORQUE TO 1000-1200 FT/LBS CALCULATED DIMENSION "Z"——————(X-Y=Z)	1000FT/LBS	1200FT/LBS	X		
49	ACTUAL DIMENSION "Z"—————— MUST BE EQUAL TO CALCULATED DIMENSION "Z" +.027" TO -.005	X	X	X		
50	INSTALLED KEYED RETAINING RING PER STEP P.	X	X	X		

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JOB:

ITEM	OPERATION	MIN	MAX.	ACTUAL	MECH	VERIFY
51	KEY WORD PART NUMBER ------ SERIAL NUMBER------ NO. 5 BEARING INNER RACE PERFORM STEPS Q THRU X: INSTALL THE NO. 5 BEARING INNER RACE & SPANNER NUT LOCKING PIN & RETAINER. TORQUE TO 450-500 FT LBS CHECK CLEARENCE BETWEEN SPANNER NUT AND OIL TURF, KEYED LOCK RING RECORD CLEARENCE AS CLD------	450 FT LBS	500 FT LBS	X		
52	INSTALLATION OF STG 2 HPT NOZZLE ASSY PER PARA. 18-2-1-13, ENSURE STG. 2 HPT NOZZLE ASSY AND HPT ROTOR ASSY ARE MATCH MACHINED AND THE BLADE TO SHROUD CLEARENCES ARE MET (REF CHAPT. 12) STG 1 ACTUAL: ----STG. 2 ACTUAL: ----	X	X	X		
53	PERFORM STEPS E THRU N, REINSTALL THE STG. 2 BLADES. STARTING WITH NO. 1 BLADE AT POSITION MARKED 1-1 ON REAR OF DOVETAIL TANGS CONTINUE INSTALLING BLADES & DAMPER SLEEVES IN CLOCKWISE DIRECTIONS.	X	X	X		
54	INDICATE SHANK TYPE. ( ) TWIN SHANK CLEARENCE (S1=0.217" MIN TORQUE BLADE RETAINING BOLTS TO 110-120 IN-LBS	110 in/lbs	120 in/lbs	X		
55	( ) single shank clearance (S1= 0.126" MIN TORQUE BLADE RETAING BOLTS TO ~~[illegible]~~ 110-120 IN-LBS	85 in/lbs	90 in/lbs	X		
56	CHECK THE CLEARENCE BETWEEN BLADE RETAINER AND DISK USING A FEELER GAUGE. CLEARENCE IS .001" (MAX)	X	.001"	X		
57	INSTALLATION OF TURBINE MID FRAME PARA. 18-2-1-14 A) INSTALL THE TMF BY PERFORMING STEPS A THRU I. ENSURE THE TMF IS PROPERLY ALIGNED AS IT IS INSTALLED B) PERFORM STEPS K THRU M (FIG. 18-44) BY INSTALLING THE FLANGE BOLTS AND BRACKETS. TORQUE THE BOLTS TO 160-180 IN/lbs	160 in/lbs	180 in/lbs	X		
59	**Final Inspection**	X	X	X	JAK	

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Power Turbine Final Assembly

JOB: L 5025

ITEM	OPERATION	MIN	MAX	ACTUAL	MECH	VERIFY
	POWER TURBINE FINAL ASSEMBLY					
1	Prior to assembly, check Workscope for all applicable Service Bulletins	x	x	x		
2	Verify That all applicable work instructions for this module have been completed with	x	x	x		
	Record the following:					
2A	Nomenclature / Part Number / Serial Number LPT Module L 16652 Pod F/A 00578 (Same as all shaft)	x	x	x	-	
3	[redacted]	x	x	X	N/A	
	Installation of the LP Turbine Rotor.					
4	Install No 6 Rotating Air/Oil Seal and Dummy # 6 seal race	x	x	x	-	
5	Lower Rotor into stand (1c6884)	x	x	x		
6	*Measure and record the following dimensions* CA 12.1435 DA .7650 DB 1.7230 DB .8230 DC 1.5985 CALCULATE AND RECORD CB 5.3075 (DA+DB+DC+DD) CALCULATE AND RECORD CC 1.837 (CA-CB)	x	x	x		
	Install the forward rotating Air/Oil seal:					
7	Ensure pin is installed on forward sealing surface of Air/Oil seal	x	x	x		
8	Ensure the pin is aligned with slot on the LPT Rotor shaft	x	x	x		
9	Install No 7B Bearing forward inner race (Matched Set)	x	x	x		
10	Nomenclature / Part Number / Serial Number No 7B Bearing L 11691 Rev MRC F7352 (FWD Inner Race)	x	x	x		
11	Install Dummy Cases of Digitals	x	x	x		
	Installation of Turbine Rear Frame					
12	Install Turbine Rear Frame	x	x	x		
13	Install No 7B Bearing aft inner race (Matched Set)	x	x	x		
	Nomenclature / Part Number / Serial Number					

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JOB: L 5025

	P/N S/N				
14	No 7B Bearing L 11691 P03 MRCP 2552	X	X	X	
	No 7R Bearing LH L 11691 P03 MRCP 2552				
15	Record Dimension CC 7.835	X	X	X	
16	Note Ensure the No 7R Brg Inner Race puller groove is facing forward at installation	X	X	X	
17	Install Oil Nozzle, torque bolts to 55 - 70 in/lbs And safetywire Note Nozzle must be pointing away from manifold base	55in/lb	70in/lb	X	
18	Perform Impingement and flow check. Record 6.2	X	X	X	
19	Nomenclature Part Number Serial Number No 7R Bearing (Outer Race) L 9337 P01 MRCMR 044	X	X	X	
20	Install the No 7R Brg Outer race securing with 12ea Bolts and Nuts	X	X	X	
21	Torque Bolts to 55 - 70 in/lbs	55in/lb	70in/lb	X	
22	Install the No 7Brg Spanner Nut	X	X	X	
23	Torque nut to a minimum of 1500 FT/LBS	X	X	X	
24	Secure Key Ring, Spacer and Retainer	X	X	X	
25	Measure and Record Axial Dimensions of Air/Oil seal and Gear	X	X	X	
	DH 2.102 DJ 2.970 CD 6.475 CE 5.011 (CE=DH+DJ) CALCULATE DIMENSION CF 1.403 (CD - CE)	X	X	X	
26	Install speed sensor ring gear and air rotating Air/Oil seal	X	X	X	
	Record actual CF 1.403	X	X	X	
	Installation of overspeed transducer.				
27	Install transducers and torque in place to 55 - 70 in/lbs	55in/lb	70in/lb	X	
28	Check the Gap between tip and tooth with feeler gauge	X	X	X	
	0.032" - 0.044" Record GAP .037	0.032"	0.044"	X	

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JOB: L5025

Installation of Turbine Frame Aft Seals:

29	Install stationary ring spacer and torque bolts to 55 - 70 in/lbs	55in/lb	70in/lb	X		
30	Install the stationary aft oil seal and torque to 55 - 70 in/lbs	55in/lb	70in/lb	X		
31	Install the stationary aft air seal and torque to 55 - 70 in/lbs	55in/lb	70in/lb	X		
32	Install aft spanner nut and torque to 1000 ft/lbs	X	1000ft/lb	X		
33	Check for alignment of lot. Do not exceed 1200 FT/LBS	X	1200ft/lb	X		
34	Secure spacer, key ring and retainer	X	X	X		

Note: Clean fwd flange of TRF and Aft flange of casing halves, then apply a thin coating of Permatex No 2 Sealant to the aft flange of casing halves

35	Raise rotor until weight of the rotor and TRF is on the pick up lift stand	X	X	X		
36	Install upper and lower cases	X	X	X		
37	Install the Horizontal and Circumferential flange bolts	X	X	X		
38	Install slave bolts on the TRF and cases before rotating rotor	X	X	X		
39	Begin rotating rotor before mating cases together	X	X	X		
40	Slowly tighten horizontal bolts to allow gravity of cases	X	X	X		
41	Once cases seat torque horizontal bolts before torquing the circumferential bolts	X	X	X		
42	Torque the horizontal flange nuts starting at the forward end of casing, tighten both of the flanges simultaneously	X	X	X		
43	Install insulation blankets, straps, clamps and safetywire	X	X	X		
44	Ensure the rotor spins freely at the most forward and aft positions	X	X	X		
45	Remove rotor from assembly stand and transfer to a horizontal maintenance gully.	X	X	X		
46	Remove the No 6 dummy bearing from rotor	X	X	X		
47	Nomenclature / Part Number / Serial Number No 6 Bearing (Inner Race) 9146M72P03 MRCMF213	X	X	X		
48	Install the No 6 Brg Rotating oil seal and No 6 Brg inner race	X	X	X		

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JOB: L5025

49	Torque the spanner nut to 300 - 350 FT/LBS	300FT/LB	350FT/LB			
50	Install Key ring and Retainer	x	x	x		
51	Install the Aft shaft forward adapter and coupling nut NOT INSTALLED	x	x	x		
52	Torque Configuration 1 to 450 - 550 FT/LB N/A	450ft/lb	550ft/lb			#
	Torque Configuration 2 to 525 - 575 FT/LB	525ft/lb	575ft/lb			#
53	Install vibration pickup on the "TRF" Forward flange aft side facing forward Placed one bolt off centerline toward left side of the I P Turbine (All looking Forward)	x	x	x		
54	Install the Air tube and clamps will be	x	x	x		
55	Install 3ea Ejectors INSTALLED BY	x	x	x		
56	Install 2ea Oil tubes and clamps the safetywire FIELD SERVICE	x	x	x		
57	Ensure sprayshield are installed as required	x	x	x		
28	Final Inspection	x	x	x		

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15 ENGINE AIR CHECK RESULTS

COMPONENT	LIMIT (SCFM)	ACTUAL (SCFM)
Damper System ONLY	4.9-6.1	5.2
Combined System	15.2-17.3	16.4
No. 4 Bearing Area	12.0-14.0	13.1
No. 5 and No. 6 Bearing Area	9.0-11.0	9.3
AGB	3.6-4.0	3.7
TGB	5.3-6.1	5.5
AGB + TGB	8.1-9.5	8.7

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16 BLADE TIP CLEARANCES

LM2500
MAUI
Job# :L5025

TIP CLEARANCES FROM BLADE TO CASE LANDS										
Stage Number	[illegible]			[illegible]			[illegible]			Accept / Reject
	Minimum	Maximun	Actual	Minimum	Maximun	Actual	Minimun	Maximun	Actual	
1/178	14.425	14.429	14.429	14.364	14.368	14.364	.057	.065	.064	Accept
2/179	14.189	14.193	14.192	14.134	14.138	14.134	.051	.059	.058	Accept
3/180	13.968	13.972	13.972	13.925	13.929	13.929	.039	.047	.043	Accept
4/181	13.780	13.784	13.783	13.733	13.737	13.736	.043	.051	.047	Accept
5/182	13.607	13.611	13.610	13.554	13.558	13.558	.049	.057	.055	Accept
6/183	13.449	13.453	13.452	13.398	13.402	13.398	.047	.055	.053	Accept
7/184	13.303	13.307	13.306	13.253	13.257	13.256	.046	.054	.051	Accept
8/185	13.270	13.274	13.273	13.224	13.228	13.227	.042	.050	.047	Accept
9/186	13.270	13.274	13.273	13.225	13.229	13.227	.041	.049	.046	Accept
10/187	13.270	13.274	13.274	13.233	13.237	13.234	.033	.041	.040	Accept
11/188	13.270	13.274	13.273	13.223	13.227	13.226	.043	.051	.047	Accept
12/189	13.268	13.272	13.271	13.220	13.224	13.224	.044	.052	.048	Accept
13/190	13.268	13.272	13.271	13.220	13.224	13.224	.044	.052	.048	Accept
14/191	13.268	13.272	13.271	13.208	13.212	13.211	.056	.064	.060	Accept
15/192	13.203	13.207	13.206	13.141	13.145	13.143	.058	.066	.063	Accept
16/193	13.114	13.118	13.117	13.051	13.055	13.053	.059	.067	.063	Accept

Page 1 L5025 Blade Tip Clearances calculation sheet.xls

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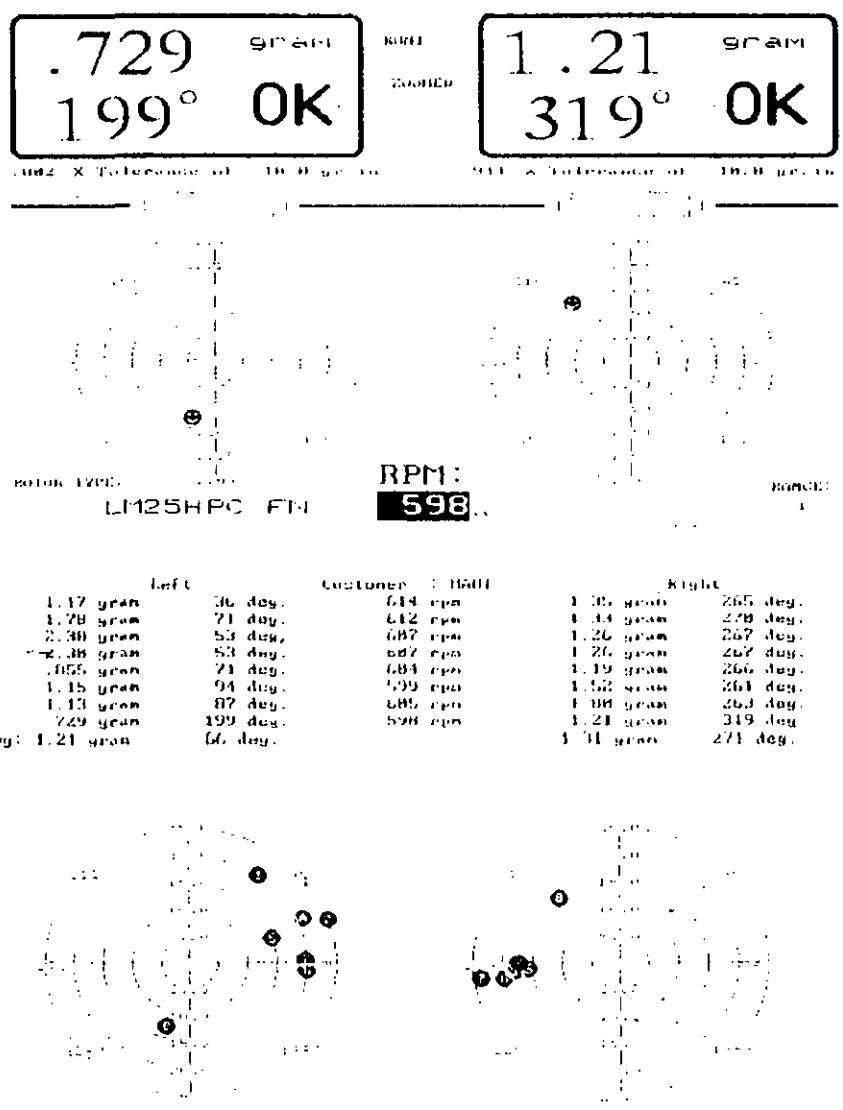
17 BALANCE RESULTS

MODULE		INITIAL (g)	LIMIT (g)	FINAL (g)	LIMIT (g)
HPC Rotor	Front(Left Plane)	1.17	10.0	0.729	10.0
	Rear(Right Plane)	1.35	10.0	1.21	10.0



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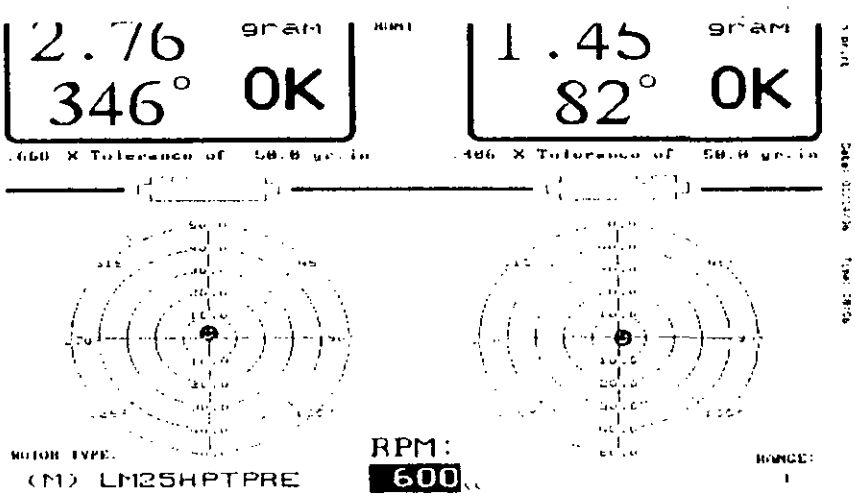
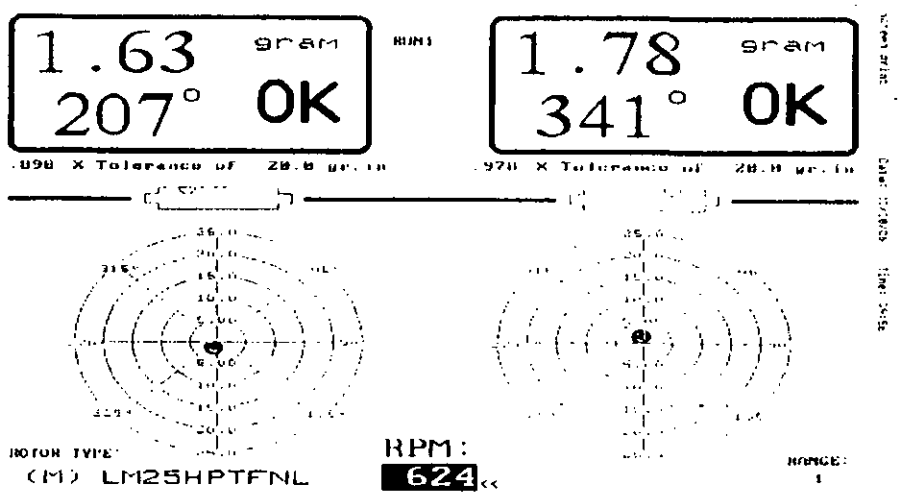
MODULE		INITIAL (g)	LIMIT (g)	FINAL (g)	LIMIT (g)
HPT Rotor	Front(Left Plane)	2.76	20.0	1.63	1.8
	Rear(Right Plane)	1.45	20.0	1.78	1.8





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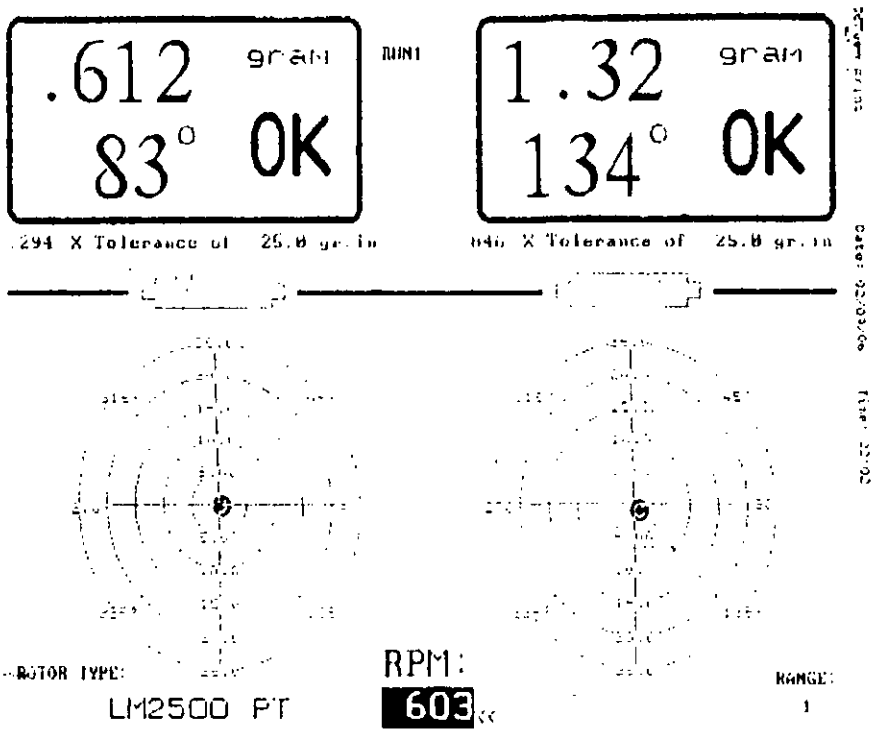
MODULE		INITIAL (g)	LIMIT (g)	FINAL (g)	LIMIT (g)
LPT	Front(Left Plane)	19.3	103.0	1.32	
	Rear(Right Plane)	48.9	103.0	.612	



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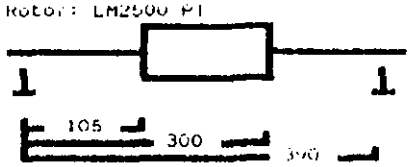
Report No. L5025 Customer MAUI
Handling *RESTRICTED* Date 4/6/2006

Time: 22:02 Date: 03/09/06

HOFMANN

American Hofmann Corporation

Rotor: LM2500 PT



Customer : MAUI
Operator : HARRY S
Rotor : LM2500 PT
JOB NUM. : L5025

	Left or Static	Right or Couple
Correction:	Remove at r : 12.0 in	Remove at r : 16.0 in
Tolerance :	25.0 gr.in	25.0 gr.in
Mode :	LR : Two plane	SC : Static Couple

Left or Static		Right or Couple		Speed	Mode
17.3 gram	9 deg.	48.9 gram	331 deg.	604 rpm	LR
21.6 gram	14 deg.	6.28 gram	117 deg.	558 rpm	LR
1.03 gram	128 deg.	5.49 gram	119 deg.	583 rpm	LR
3.40 gram	156 deg.	4.22 gram	2 deg.	581 rpm	LR
3.95 gram	152 deg.	2.67 gram	31 deg.	521 rpm	LR
4.14 gram	146 deg.	2.64 gram	24 deg.	516 rpm	LR
6.68 gram	196 deg.	9.50 gram	23 deg.	572 rpm	LR
1.64 gram	136 deg.	5.34 gram	6 deg.	543 rpm	LR
2.69 gram	140 deg.	1.91 gram	34 deg.	572 rpm	LR
1.94 gram	7 deg.	1.05 gram	175 deg.	611 rpm	LR
.612 gram	83 deg.	1.32 gram	134 deg.	603 rpm	LR

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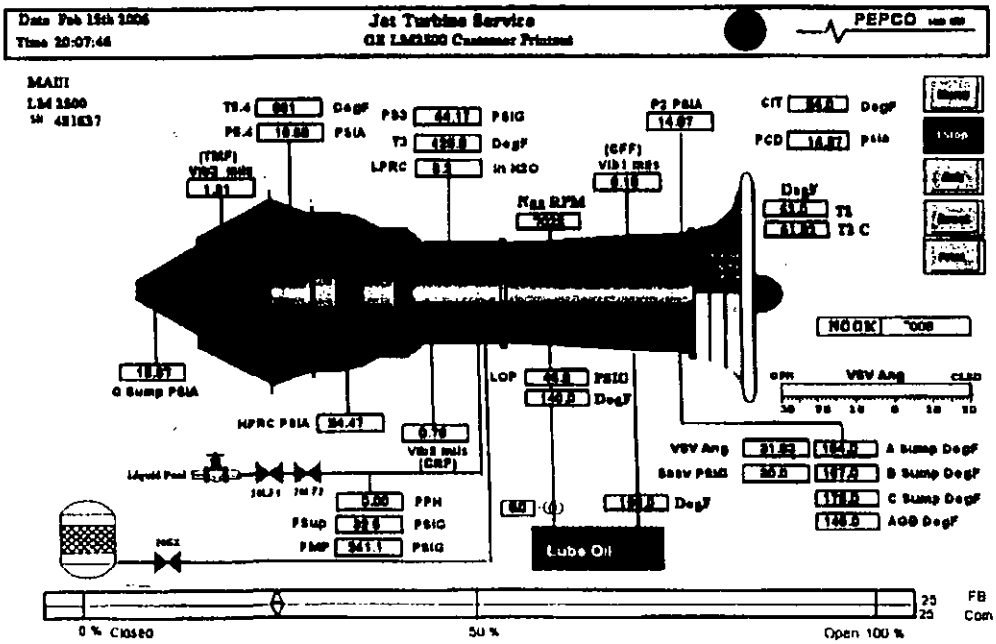
18 TEST RESULTS

Test stand verification of the subject engine was performed in Jacksonville, Florida on Friday Feb. 2nd; 2006. The validation run was performed in three parts:

1. **Break-In Run**
2. **Vibe Survey**
3. **Performance Run**

1. Break-in run



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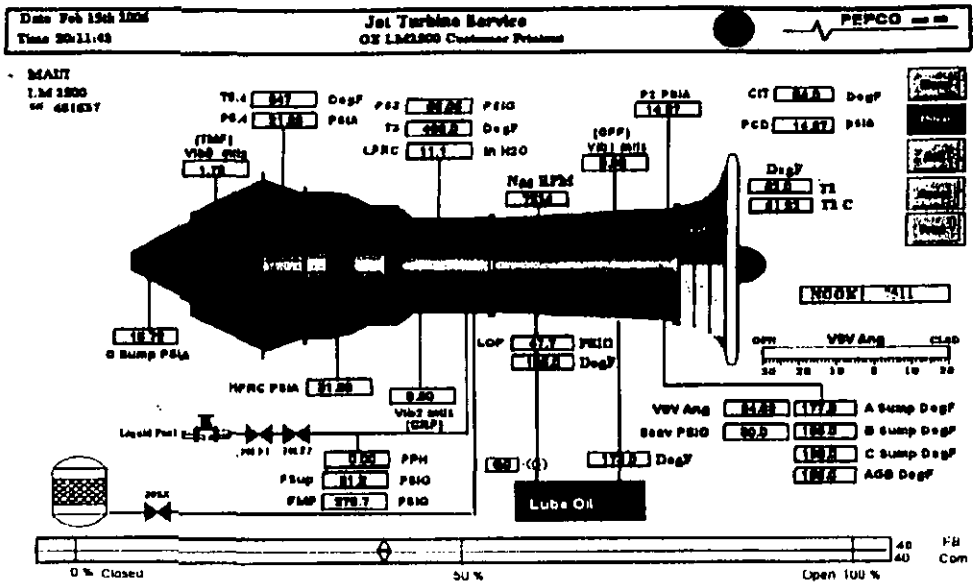
Report No L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006



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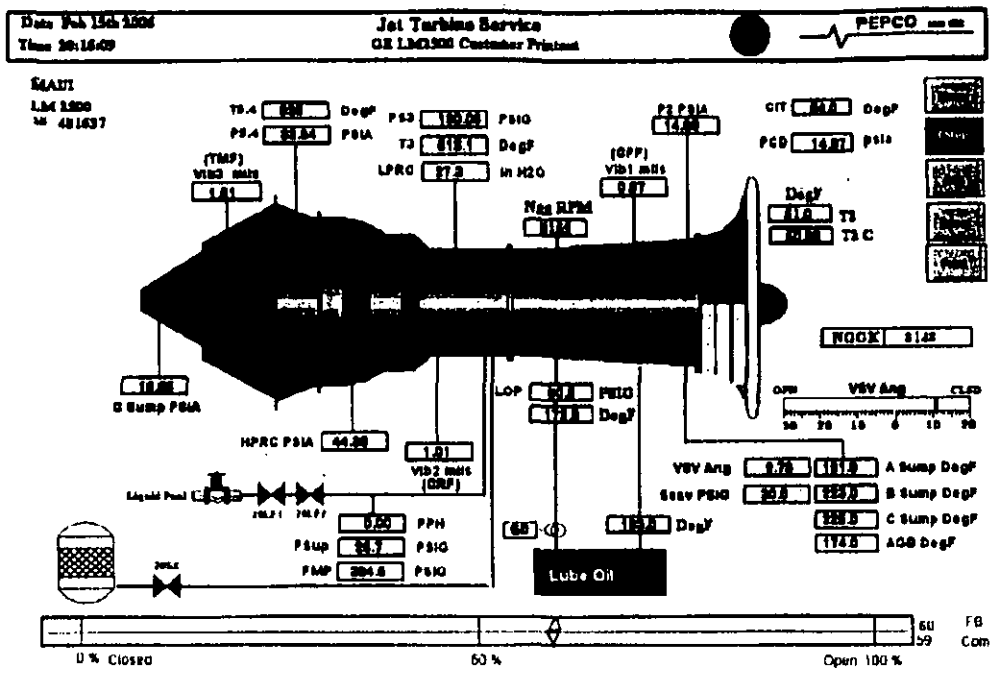

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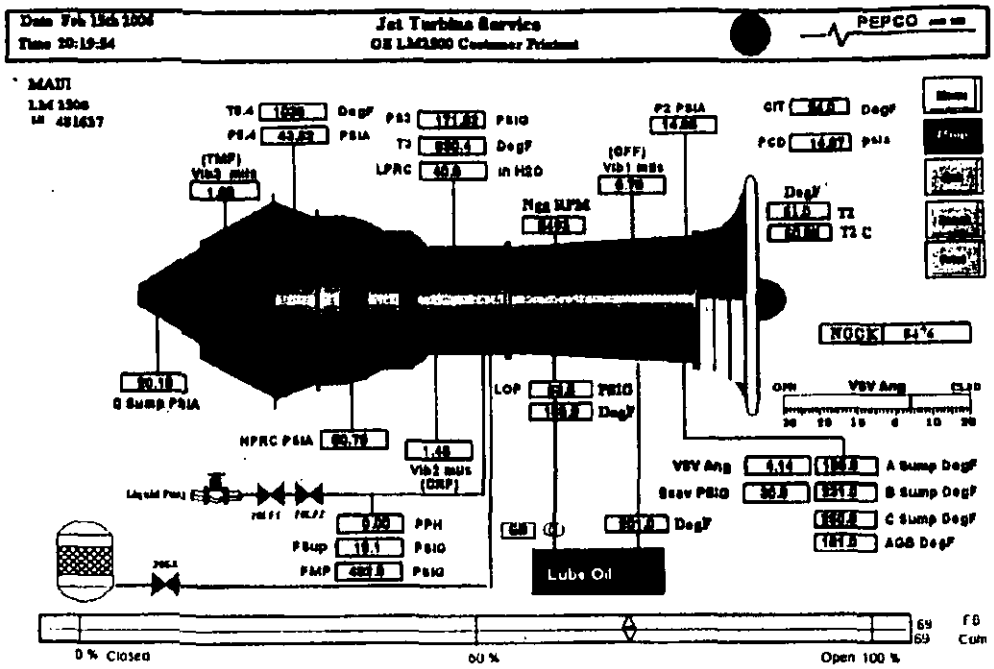

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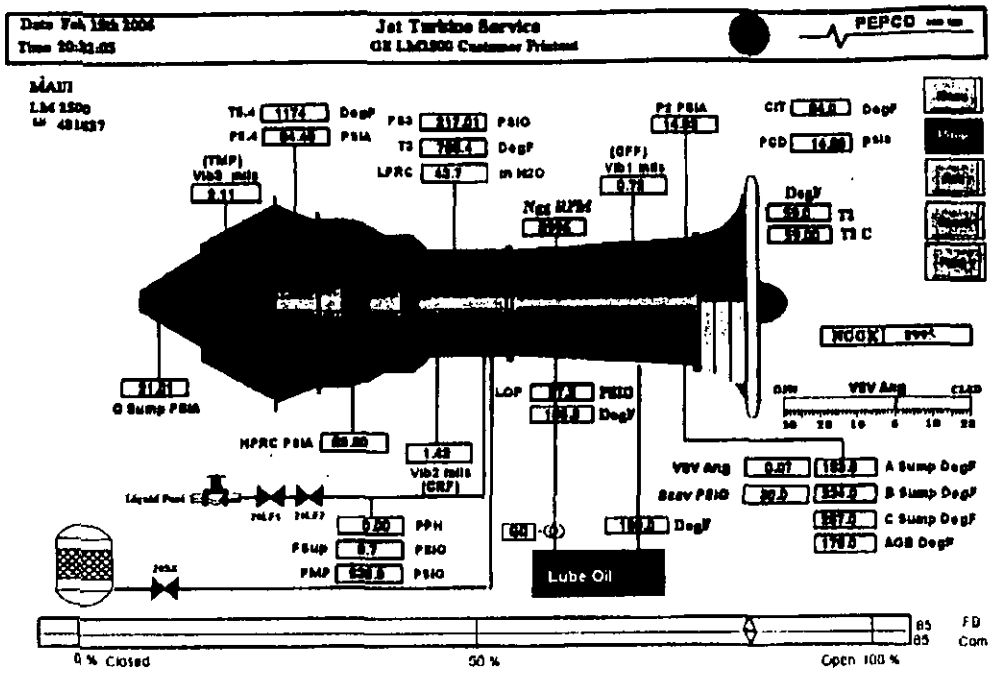

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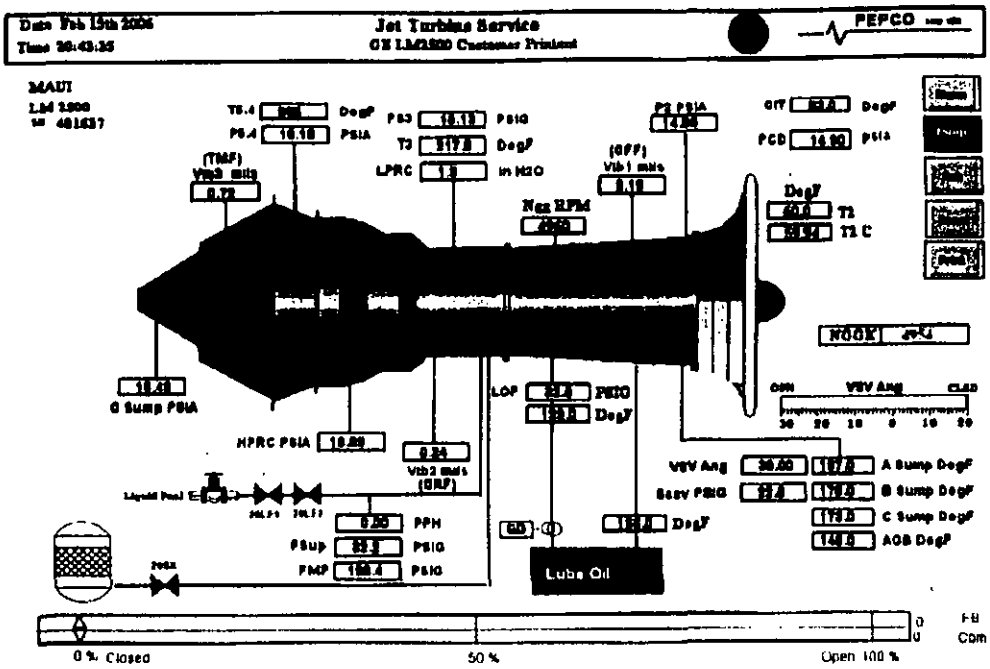

2. Vibration Survey

A vibration survey was performed during the test. No data at accelerometer location #2 was recorded since the accelerometer was disconnected at the time. All vibrations were monitored at all times and the results satisfactory and within acceptable limits. Vibrations at location #2 were monitored by a Siemens Field Balance Engineer using a portable spectrum analyzer to filter low frequency noise.

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3. Performance Run

```
=================================================================================
                         LM2500 PERFORMANCE PROGRAM Version 1.00
=================================================================================
ENGINE/Reading:              481637 / 002
DATA CALCULATED FOR A:       ss
TEST DATE:                   2/16/06
=================================INPUT=============================================

Barometric Pressure, PAMB   (psia)                    14.867
P2                          (psia)                    14.047
PS3                         (psia)                    240.30
P54                         (psia)                    56.59
T2                          (F)                       69.00
T3                          (F)                       781.20
T54                         (F)                       1236
WFM, Fuel Flow              (PPH)                     10452
Humidity                    (Grains/LB)                 72
A4                          (inches^2)                53.558
Lower Heating Value         (BTU/LB)                  18530
NGG                         (RPM)                     9395

=================================RESULTS=============================================
CALCULATED AT TEST CELL CONDITIONS

Fuel Air Ratio              (LB/LB)     FAR54       0.02205
T54B, Calculated            (R)         T54B          1985
P3                          (psia)      P3            249.57
AE8 Calculated              (in^2)      AE8           211.15
Exhaust Nozzle Flow Function            TFFT2         109.40
Delta T54                   (R)         DELT54        289.58
Isentropic Gas HP                       IGHP          31155
Compressor airflow          (PPS)       W2            135.26
Compressor efficiency                   ETAC          0.9150
Corrected speed             (RPM)       NGGK          9305.7

CORRECTED TO STANDARD CONDITIONS AND 211.2 SQ. IN. AE8
(59F T2, 14.7 P0, NO HUMIDITY, NO LOSSES)

Isentropic Gas HP                       IGHPK         32272
Fuel Flow                   (PPS)       WFMK          10847
Specific Fuel Consumption   (LB/HP-HR)  SFCK          0.336
T54I                        (R)         T54IK         1666.5
Compressor airflow          (PPS)       W2K           142.87
```

```
=================================================================================
                         LM2500 PERFORMANCE PROGRAM Version 1.00
=================================================================================
ENGINE/Reading:              481637 / 002
DATA CALCULATED FOR A:       ss
TEST DATE:                   2/16/06
```


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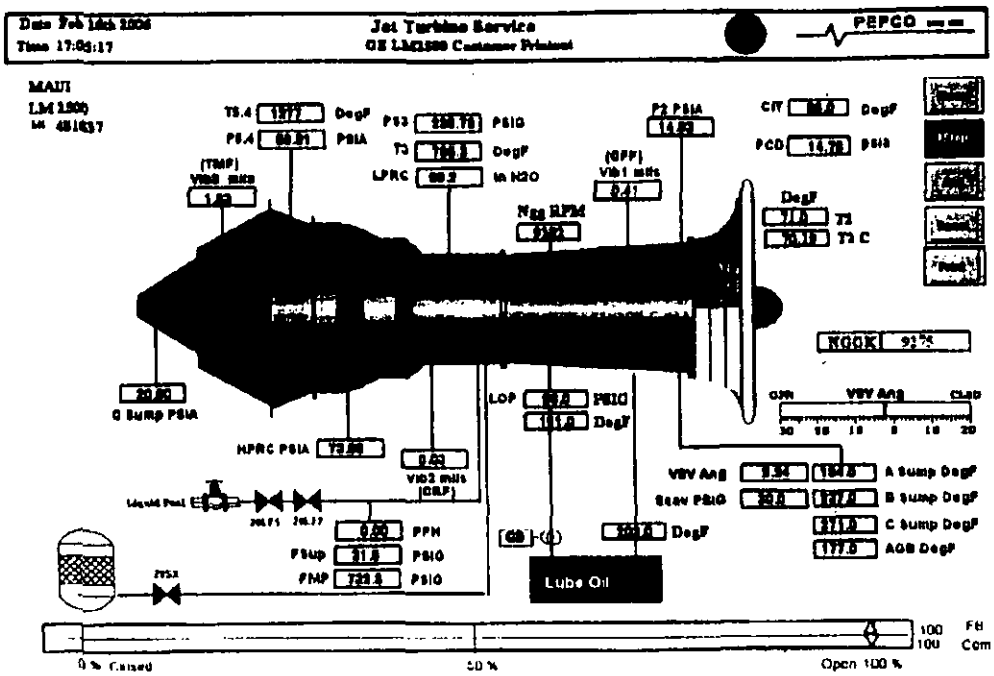
Report No L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006



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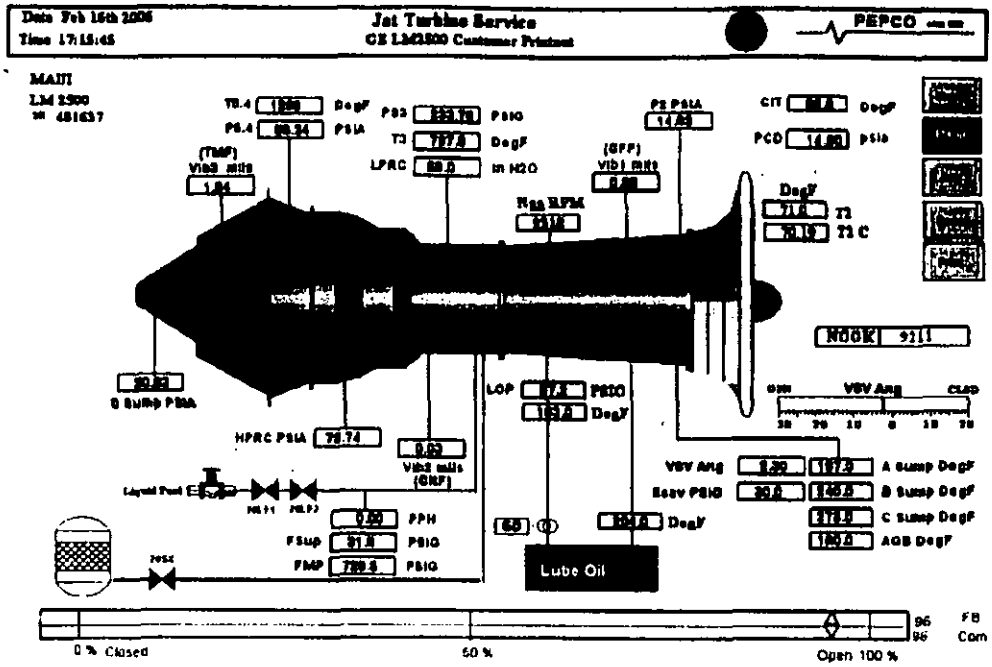

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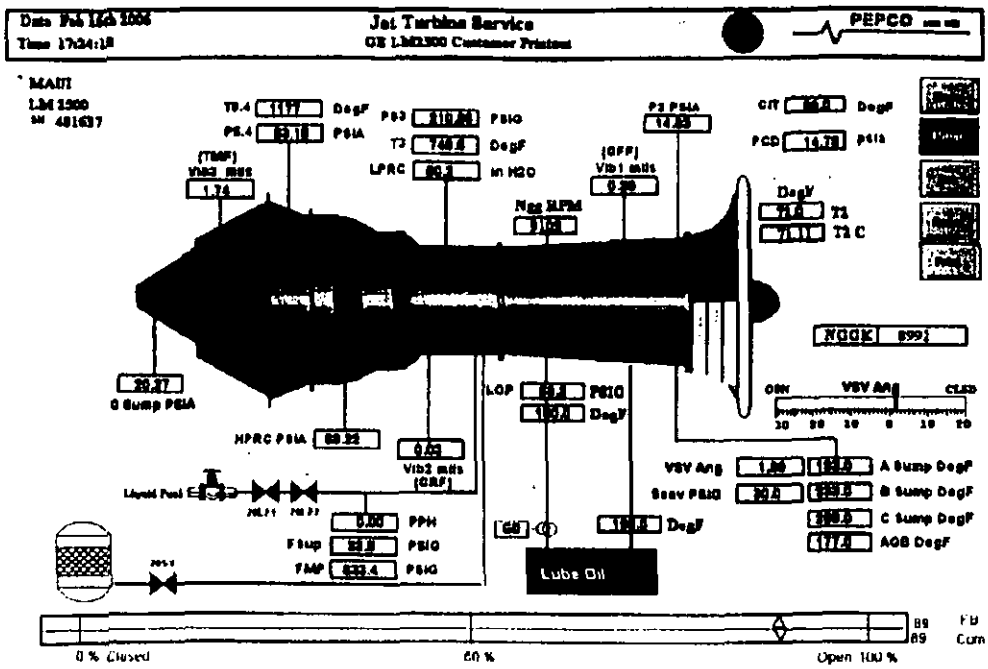

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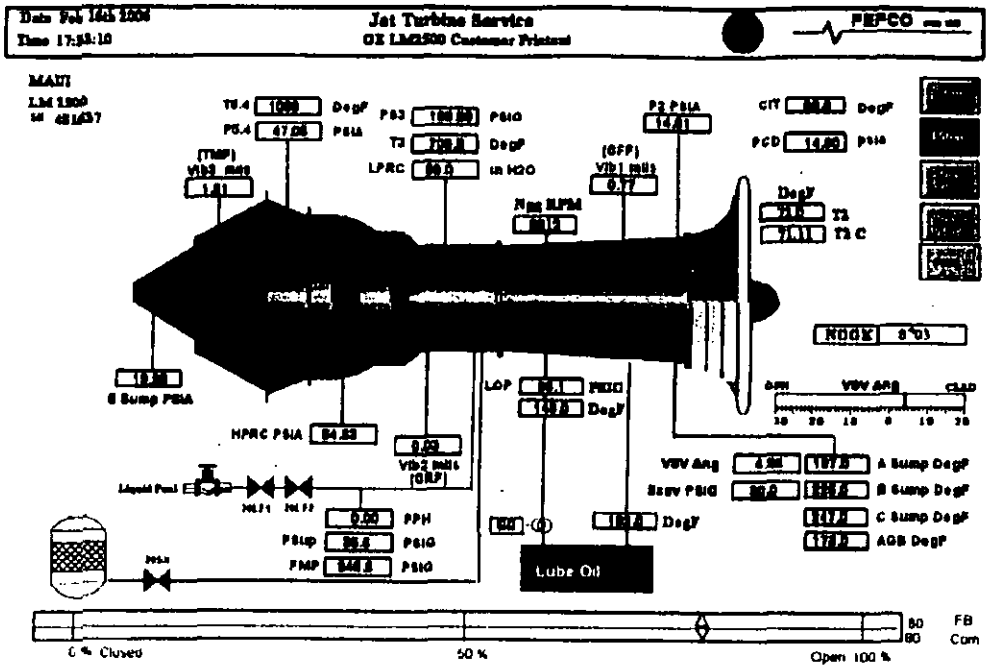

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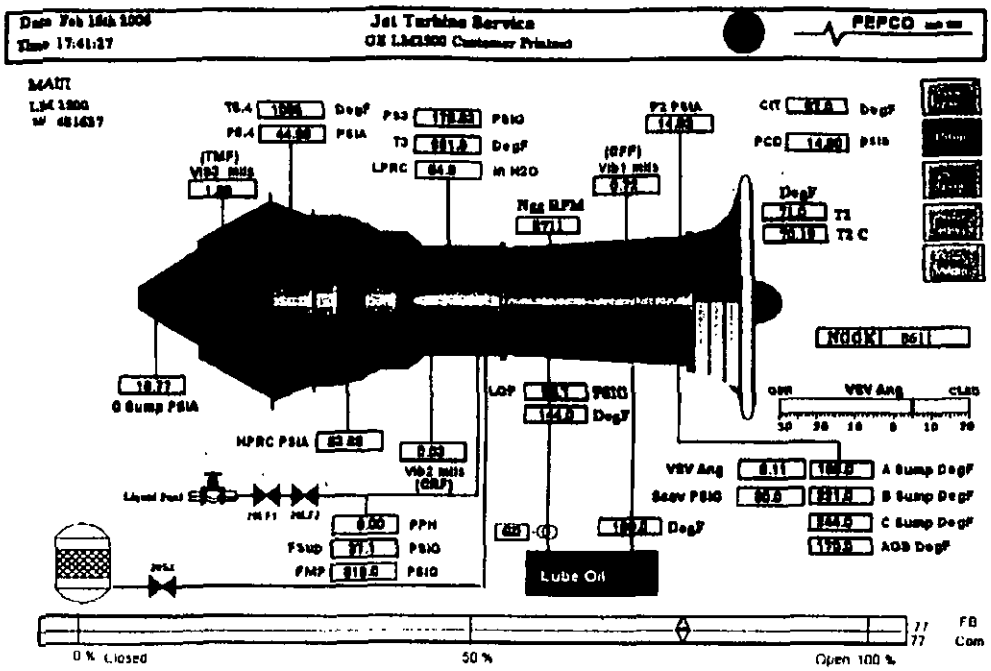

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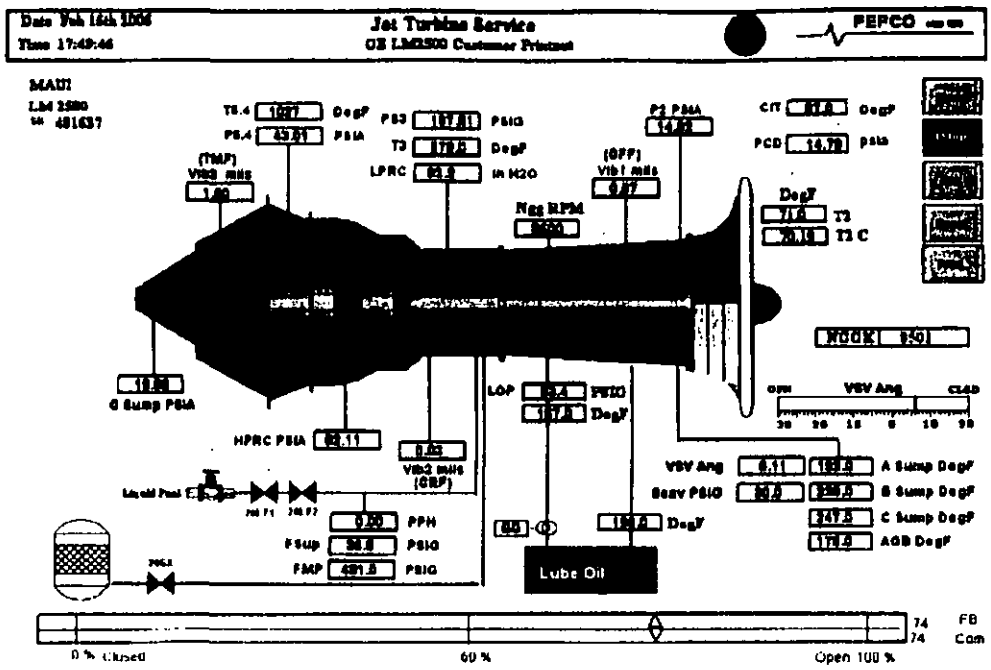

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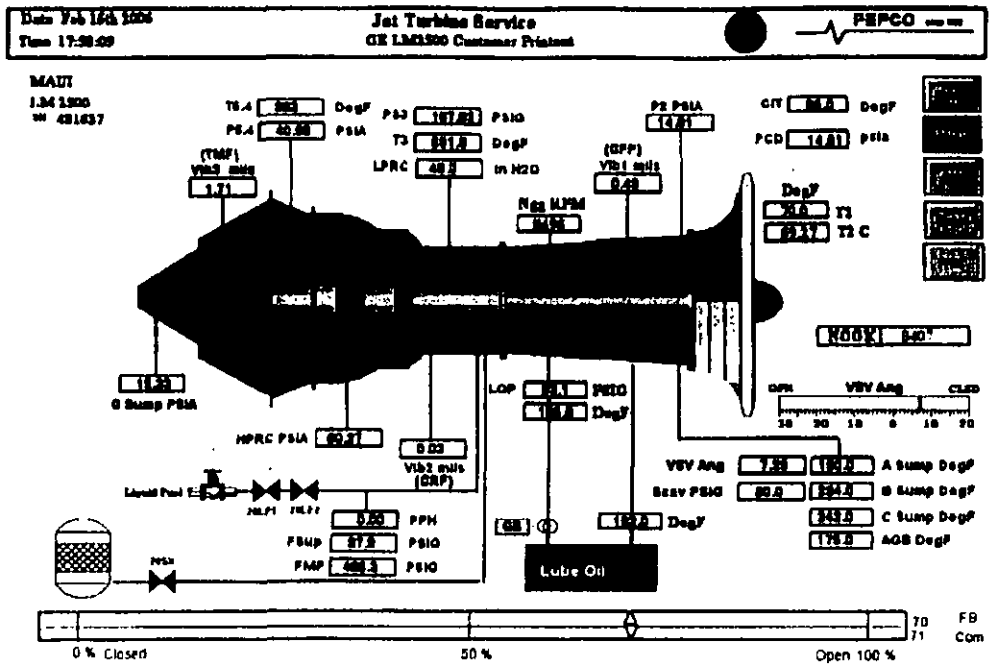

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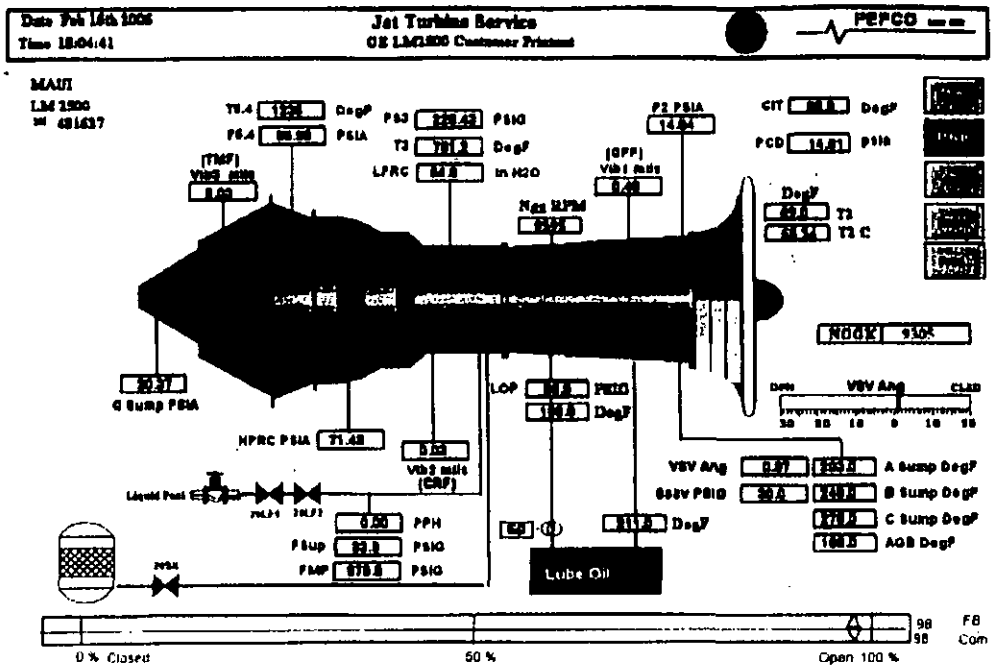

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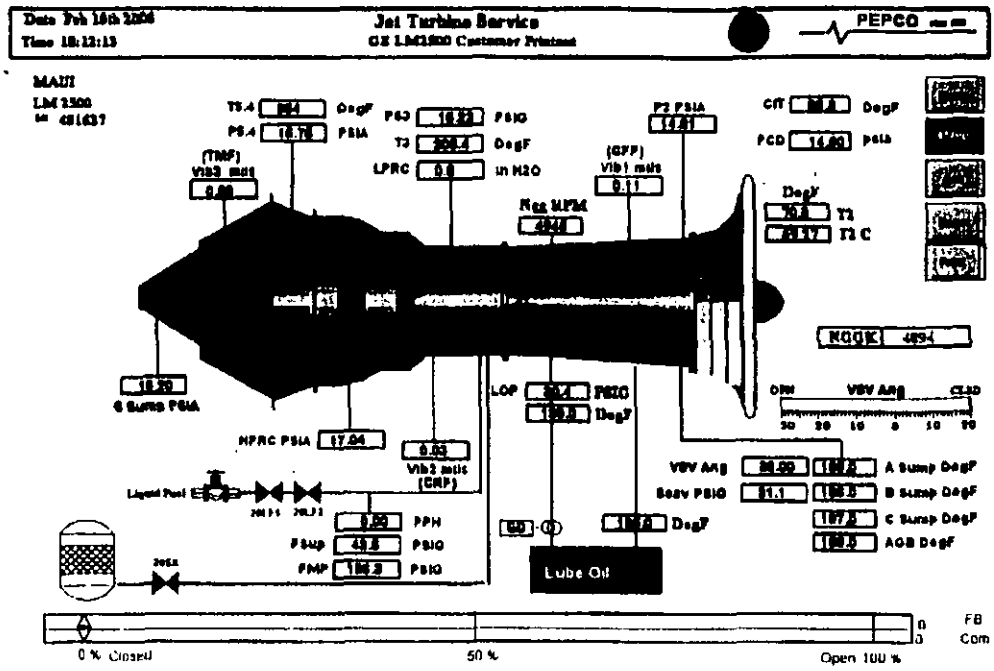

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Handling *RESTRICTED* | Date 4/6/2006

High Pressure Recoup Orifice Selection Worksheet

LM2500 PE, PF, PI, PL, PJ, GE Models Only!

Engine Serial Number: 481-637 **Model:** LM2500 **Date:** 2/16/2006

An equation has been developed to optimize the loads on the 4B Bearing for the LM2500 gas generator and gas turbine. Does not cover PH or Plus models.
This worksheet is a step-by-step procedure to convert engine data, and size the HPRC orifice to maintain the load in the recommended predicted range.

Six measurements are needed: **All Pressures are ABSOLUTE, NOT GAGE!**

Current Orifice Diameter		0.4	inches	
[1] **Inlet Temperature**	T2	72	deg F	[1]
[2] **Inlet Pressure**	P2	14.79	Psia	[2]
[3] **High Pressure Recoup**	HPRC	74.59	Psia	[3]
[4] **Compressor Discharge Pressure**	PS3	229.02	Psia	[4]
[5] **Core Speed**	NGG	9253	RPM	[5]
[6] **HPT Exhaust Pressure**	P54	56.9	Psia	[6]

Calculations

[7] **Corrected High Press Recoup**	HPRC/Delta	[3]____ / [2]____ *14.696=	74.12	[7]
[8] **Corrected Comp Discharge Press**	PS3/Delta	[4]____ / [2]____ *14.696=	227.56	[8]
[9] **Temperature Ratio**	Theta	([1]____ + 459.67) / 518.67) =	1.025	[9]
[10] **Corrected Core Speed**	NGGR	[5]____ / SQRT([9]____) =	9139	[10]
[11] **HPT Pressure Ratio**	PS3/P54	[4]____ / [6]____ =	4.025	[11]

4B Bearing Optimization:

Constant		582.88	[12]
[7]____	* 1.3041=	96.65	[13]
[8]____	* .55675=	126.70	[14]
[10]____	* – .074472=	-680.61	[15]
[11]____	* –27.856=	-112.12	[16]
Sum Total	[12]+[13]+[14]+[15]+[16]=	13.48	[17]
If Total above 23.08 :	[17] - 23.08 =	0.00	[18]
If Total below 16.92 :	[17] - 16.92 =	-3.44	[19]

If 16.92<Total<23.08, no adjustment needed

Predicted ADJUSTMENT needed to Current Orifice Diameter (in): [18] or [19] / 78 = -0.044 [20]

New Orifice Diameter (in): [A] ± [20] = 0.356 [B]

IF [20] IS LESS THAN +/- 0.05 in., NO ADJUSTMENTS NECESSARY

A value less than 16.92 is better than a value greater than 23.08, if both requirements cannot be satisfied

Positive (using [18]) makes hole larger, negative (using [19]) requires smaller hole

Each P0 orifice number is the orifice diameter X 10 in inches

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JET TURBINE SERVICES

620 NW 35th St.

Boca Raton, FL 33431

FEB17, 2006

Subject: Post Engine Test Inspection

Customer: MAUI ELECTRIC LM2500 S/N 481-637

Post engine inspection was completed per JTS post test procedures

Inspection included:

Oil system drained

Oil pump and gear box cleaning

Oil filter cleaning

Boroscope of low and high compressor section

Visual inspection of the exterior engine for oil leaks and FOD damage after test run

During boroscope inspection found some damage in the S2 HPT section of the Engine.

Regards,

Alpha Barnes

Manager, Test Cells

Jacksonville, Fl.

JET TURBINE SERVICES DOC

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19 SCRAPPED PARTS LIST

Component	Part Number	Quantity
BLADE, STAGE 6	9102M36P11	10
SEAL ASSY, STG 2 AIR	9102M46G04	2
SEAL ASSY, STG 2 AIR	9102M46G05	2
SHROUD, LPT-1	9663M23G10	14
SHROUD, LPT-2	9663M24G19	1
SHROUD, LPT-2	9663M24G19	9
SHROUD, STG 3	9663M24G22	1
SEAL	9693M04P02	1
BLADE, STAGE 10	K043P25	1
BLADE, STAGE 10	K043P28	1
BLADE, STAGE 11 (NARROW)	K144P17	3
BLADE, STAGE 11 LOCKING	K144P19	1
BLADE, STAGE 11 (WIDE)	K144P20	1
BLADE, STAGE 1	K157G02	1
VANE, STAGE 12 (NARROW)	K209P27	1
VANE, STAGE 12 (NARROW)	K209P27	1
VANE, STAGE 12 (WIDE)	K209P28	1
BLADE, STAGE 12 (WIDE)	K245P20	1
BLADE, STAGE 2	K256P07	3
VANE, STAGE 13 (NARROW)	K310P19	3
VANE, STAGE 13 (WIDE)	K310P20	2
BLADE, STAGE 13 (NARROW)	K326P01	13
BLADE, STAGE 13 LOCKING	K326P02	2
BLADE, STAGE 13 LOCKING	K326P02	2
BLADE, STAGE 13 LOCKING	K326P03	1
VANE, STAGE 3	K344P02	2
VANE, STAGE 3	K344P02	1
BLADE, STAGE 3 (WIDE)	K350P28	1
VANE, STAGE 14 (NARROW)	K412P37	3
VANE, STAGE 14 (WIDE)	K412P38	26
VANE, STAGE 14 (WIDE)	K412P38	1
BLADE, STAGE 14 (NARROW)	K427P01	6
VANE, STAGE 4	K445P03	1
VANE, STAGE 15 (WIDE)	K513P32	1
VANE, STAGE 5	K546P02	3
VANE, STAGE 5	K546P02	1
BLADE, STAGE 15 (NARROW)	K547P38	8
BLADE, STAGE 15 (NARROW)	K547P38	1
BLADE, STAGE 15 (WIDE)	K547P41	8
BLADE, STAGE 15 (WIDE)	K547P41	2
VANE, STAGE 6	K647P02	4
VANE, STAGE 6	K647P02	8
BLADE, STAGE 16 (NARROW)	K648P34	5

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Report No. L5025 Customer MAUI

Handling *RESTRICTED* Date 4/6/2006

Component	Part Number	Quantity
BLADE, STAGE 16 LOCKING	K648P36	2
BLADE, STAGE 16 (WIDE)	K648P37	1
BLADE, STAGE 16 (WIDE)	K648P37	1
BLADE, STAGE 16 (WIDE)	K648P37	8
BLADE, STAGE 6 LOCKING	K669P18	1
BLADE, STAGE 6 (WIDE)	K669P20	2
VANE, STAGE 16	K688P19	1
VANE, STAGE 16	K688P19	1
VANE, STAGE 16	K688P20	1
BLADE, STAGE 8 (WIDE)	K841P20	2
BLADE LPT, STAGE 1	L21491P03	18
BLADE, LPT STAGE 2	L21492P04	6
BLADE, STAGE 3	L21493P04	7
BLADE, STAGE 3	L21493P04	13
NOZZLE, STAGE 1 LPT	L21751G01	3
NOZZLE, STAGE 1 LPT	L21751G01	1
LUBE & SCAVENGE PUMP	L24407P04	1
TUBE ASSY	L24356G01	1
SEAL	9687M54G06	1
SEAL	L21431G02	1
SUPPORT	9102M54G06	1
SHEILD	9632M97G03	1

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CA-IR-331

Ref: MECO Responses to CA-IR-103, Page 7; CA-IR-2, T-5, Attachment 111 (M16 CT Overhaul).

Please provide the following:

a. Service and materials to perform the M16 overhaul in 2007 are estimated at $2,529,600. Please provide complete copies of all supporting studies, vendor bids, analyses, workpapers and other documents supportive of this value (if any exist).

b. State and describe the estimated dates and scope of work associated with the 2007 M16 overhaul and explain steps taken by MECO to plan and manage this work.

c. Provide copies of overhaul reports and other documents associated with your response to part (b) of this information request, including any updated cost estimates for same.

d. If work has commenced on the M16 overhaul, provide actual monthly charges incurred to date and anticipated to completion in connection with this project.

e. Provide copies of contracts, invoices and other documents supportive of your response to part (d) of this information request, as available.

f. CA-IR-2, Attachment 111 states that this estimate is "based on cost of last M16 Major OH in 1999." Please explain all reasons why this work done eight years ago is believed to be indicative of work scope and cost today.

g. Provide copies of all studies, reports, analyses, workpapers and other documents supportive of your response to part (f) of this information request.

MECO Response:

a. Please refer to the response in CA-IR-330, part a, for the explanation of the estimated $2,529,600 cost of the M16 overhaul in 1999-2000. The Request For Proposal on the M16 overhaul work in 2007 is attached as Exhibit 1. This proposal is based on a percentage of blades that are expected to be replaced. Depending upon inspection at tear down, this proposed repair cost may change.

b. The engine for the M16 overhaul was removed on January 5, 2007 and sent to a repair facility in Calgary, Canada at TransCanada Turbines for overhaul. At that time, the MECO spare engine was installed to provide power to the system. The overhauled engine was re-installed and returned to service on June 2, 2007. MECO normally allows 3 days for the

removal and installation of the spare engine and another 3 days to remove the spare engine and reinstall the overhauled engine. To minimize any capacity deficit, the engine change out is done on a Friday, Saturday, and Sunday when MECO normally experiences a lower system load. When an engine and hot section are removed together, a day can be saved because these components do not have to be separated.

c. A copy of the overhaul report is attached as Exhibit 2.

d. The monthly charges for the M16 overhaul in 2007 is supplied as Exhibit 3. The total cost of the 2007 M16 overhaul was $3,660,329.12.

e. Copies of invoices received from the vendor that did the overhaul are attached as Exhibit 4.

f. The 50,000 hour overhaul done in 1999 was a complete overhaul which included the engine and hot section. The overhaul done in 1999 is representative of the overhaul in 2007 where both engine and hot section were sent back to the overhaul facility for refurbishment. When the engine and hot section are overhauled together the removal and installation of the components is forecast to take 2 days each. If just the engine is replace or just a hot section is done the work takes 3 days each. This additional day is due to separating the engine and hot sections so the appropriate part can be replaced. If done together the engine and hot section can be removed in one piece. In CA-IR-2, Attachment 111 the overhaul is identified as a two day overhaul which implies the engine and hot section were removed in one piece and not separated.

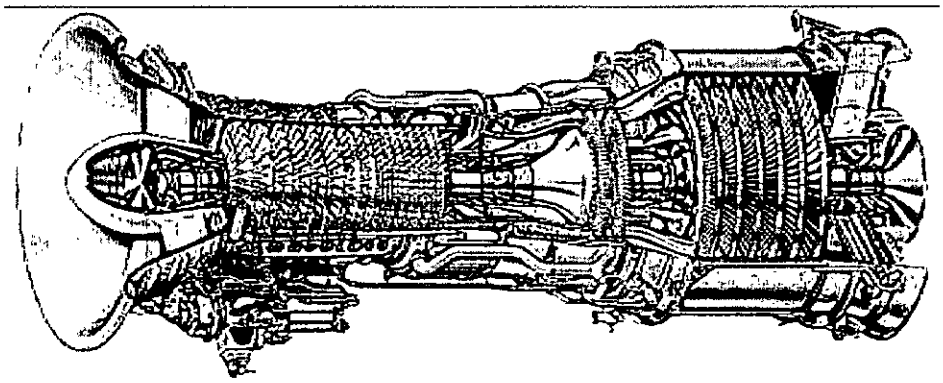
g. As mentioned in CA-IR-279, the overhaul report for the 1999 overhaul of unit M16 could not be located. The 2007 overhaul report is attached as Exhibit 2.

TRANSCANADA TURBINES
We know your business.

Final Report

MODULE SUMMARY

TRANSCANADA TURBINES



ESN 481-669
Final Report

Customer: **Maui Electric Co**	Induction Date: 24-Jan-07		Sales Order: **06-2LM-060**
Engine Type: **LM2500**	Model: GE		P.O. M31402
TSN (hrs)	TSO (hrs) 51,490	TSR (hrs) N/A	TSHS/ML (hrs) 19,314

LM2500 REPAIR WORKSCOPE

Work will be conducted in accordance with the General Electric Industrial Repair Manual, GEK99418, TCT workscope, and/or Customer requirements. The purpose of this document is to provide work-scope instructions for the repair of a LM2500 gas turbine engine. The overhaul will be accomplished at TransCanada Turbines facility located in Airdrie, Alberta.

REASON FOR REMOVAL

Engine was scheduled for an Overhaul of the GT assembly.

Please refer to inspection report for module details

1. Inlet Gearbox (IGB)
   - Disassembled, cleaned and inspected.
   - All bearings were replaced.
   - IGB gearshaft was deemed scrap.
   - SB-160 was incorporated.

2. Accessory Gearbox (AGB)
   - Disassembled, cleaned and inspected.
   - All bearings were replaced.
   - Radial driveshaft and numerous gears were found to be scrapped.

3. Compressor Front Frame (CFF)
   - Disassembled, cleaned and inspected.
   - #3 bearing was replaced.
   - Oil inlet tube was replaced.
   - SB-085 was incorporated

4. High Pressure Compressor Stator (HPCS)
   - Disassembled, cleaned and inspected.
   - Sent compressor cases to vendor for overhaul and grind.
   - Overhauled vanes in house.

5. High Pressure Compressor Rotor (HPCR)
   - Disassembled, cleaned and inspected.
   - Sent all disks and spools to vendor for overhaul.
   - Sent all compressor blades to vendor for overhaul.
   - Numerous blades were scrapped at vendor.
   - SB-174 was incorporated.
   - HPCR was ground to nominal clearance dimensions.

6. Compressor Rear Frame (CRF)
   - Disassembled, cleaned and inspected.
   - Sent CRF frame to vendor for a light overhaul including de-coking.
   - #4B and #4R bearings were replaced.

7. Turbine Mid Frame (TMF)
   - Disassembled, cleaned and inspected.
   - Sent TMF to vendor for overhaul. Liner was replaced.
   - #5 and #6 bearings were replaced.

8. Combustor
   - Routed to vendor for overhaul.

9. High Pressure Turbine Rotor (HPTR)
   - Disassembled, cleaned and inspected.
   - Routed all blades to vendor for overhaul.
   - All stage 1 and 2 blades were scrapped at vendor.
   - Thermal shield was deemed scrap at vendor.

10. High Pressure Turbine Nozzle S1 (HPTN1)
    - Disassembled, cleaned and inspected.
    - Routed S1 nozzles to vendor for overhaul.
    - Qty of 3 S1 nozzles were scrapped at vendor.

11. High Pressure Turbine Nozzle S2 (HPTN2)
    - Disassembled, cleaned and inspected.
    - Routed S2 nozzles to vendor for overhaul.
    - Qty of 5 S2 nozzles were scrapped at vendor.
    - Routed S1, S2 shrouds, and interstage airseals to vendor for overhaul.
    - Qty 2 S2 shrouds were scrapped at vendor.
    - S1 shrouds and interstage airseals were overhauled successfully.
    - Nozzle assembly was ground

12. Low Pressure Turbine Assembly (LPTA)
    - Disassembled, cleaned and inspected.

13. Low Pressure Turbine Rotor (LPTR)
    - Disassembled, cleaned and inspected.
    - Routed S1-S3 blades to vendor for overhaul and PTAL equivalent coating.
    - Numerous blades were scrapped at vendor.

14. Low Pressure Turbine Stator (LPTS)
    - Disassembled, cleaned and inspected.
    - Routed S1-S3 nozzles vendor for overhaul.
    - Routed all shrouds, and interstage airseals to vendor for overhaul.

15. Turbine Rear Frame (TRF)
    - Routed to vendor for strut repair and de-coking.
    - #7 bearing was replaced.

16. Other
    - Dual fuel nozzles were sent to vendor for overhaul and upgrade to P07.
    - VG controller not received with engine.
    - L&S pump was sent for OH.
    - Engine Test was carried out.
    - No LPT spin test is required.

Service Bulletin Summary:

➢ SB-045	Improved Borescope plugs.	Previous compliance.
➢ SB-085	#3 Oil seal Teflon seal.	Incorporated on this visit.
➢ SB-091	Ejector tube modification P series.	Incorporated on this visit.
➢ SB-098	B sump improved vent seals.	Previous compliance.
➢ SB-102	IGB cap improvement.	Previous compliance.
➢ SB-105	B sump improved insulation.	Previous compliance.
➢ SB-109	VSV bellcrank and rigging.	Previous compliance.
➢ SB-116	TMF Lube supply line bracket.	Previous compliance.
➢ SB-117	Individual T5.4 probes.	Previous compliance.
➢ SB-160	IGB oil nozzle improvement.	Incorporated on this visit.
➢ SB-165	Balance piston seal S/N	Incorporated on this visit.
➢ SB-168	CRF Seal support.	Previous compliance.
➢ SB-174	HPCR S15 locking blade replacement.	Incorporated on this visit.
➢ SB-179	L&S pump improvement L44500P	N/A to received PN.
➢ SB-190	TMF torroid hardware	Incorporated on this visit.

TRANSCANADA TURBINES
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APPENDIX A: INSPECTION REPORT

481-669
Inspection Records

LM2500 COMPRESSOR FRONT FRAME					
Frame, Compressor Front					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal, Stationary (Inlet) Air					
P/N Found:	L44765G01	S/N: N/A			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Replace Teflon Seal Surface					
Seal, Ring					
P/N Found:	9691M37P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter B		12.4990			
Diameter J		13.6160			
Bearing, No. 3 Roller					
P/N Found:	L31708P01	S/N: MDA693FM			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Seal, Stationary Oil, No. 3 Bearing					
P/N Found:	L47033G01	S/N: ILLEGIBLE			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Overhaul Seal Surface					
Housing, No. 3 Bearing					
P/N Found:	L31710G01	S/N: FIA16632			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Oil holes elongated.					
Support, Seal, A-Sump					
P/N Found:	9695M82P01	S/N: TEY4346			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Retainer, 3R Bearing					
P/N Found:	L31711P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Tube, Oil Damper					
P/N Found:	L31818G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
worn fitting					
Tube Assy, Oil Supply					
P/N Found:	L31778G01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Sleeve, Shaft - Transfer Gearbox, Fwd					
P/N Found:	9671M92P03				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Cover, CFF					
P/N Found:	L21220P01				
Qty Serviceable:	5	Qty Repairable:	0	Qty Scrap:	0
LM2500 HPC ROTOR					
Rotor Assembly, Compressor					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Disk, HPCR Stage 1					
P/N Found:	9021M62P04	S/N: RPMCL312			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Tto be cleaned, inspected, and repaired as required.					
Disk, HPCR Stage 2					
P/N Found:	9021M63P12	S/N: GWNCH489			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
To be cleaned, inspected, and repaired as required					
Blade, HPCR Stage 1					
P/N Found:	K157G02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	36
Overhaul					
Blade, HPCR Stage 2					
P/N Found:	K256P06				
Qty Serviceable:	0	Qty Repairable:	26	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 3 (Wide & Narrow)					
P/N Found:	K350P17				
Qty Serviceable:	0	Qty Repairable:	38	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 3 (Locking)					
P/N Found:	K350P18				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 3 (Locking)					
P/N Found:	K350P19				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 4 (Wide & Narrow)					
P/N Found:	K451P17				
Qty Serviceable:	0	Qty Repairable:	41	Qty Scrap:	0
Overhaul					

Blade, HPCR Stage 4 (Locking)		
P/N Found: K451P18		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 4 (Locking)		
P/N Found: K451P19		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 5 (Wide & Narrow)		
P/N Found: K552P17		
Qty Serviceable: 0	Qty Repairable: 44	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 5 (Locking)		
P/N Found: K552P18		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 5 (Locking)		
P/N Found: K552P19		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 6 (Wide & Narrow)		
P/N Found: K669P17		
Qty Serviceable: 0	Qty Repairable: 50	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 6 (Locking)		
P/N Found: K669P18		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 6 (Locking)		
P/N Found: K669P19		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 7 (Wide & Narrow)		
P/N Found: K775P13		
Qty Serviceable: 0	Qty Repairable: 52	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 7 (Locking)		
P/N Found: K775P14		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		

Blade, HPCR Stage 7 (Locking)					
P/N Found:	K775P15				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 8 (Wide & Narrow)					
P/N Found:	K841P17				
Qty Serviceable:	0	Qty Repairable:	60	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 8 (Locking)					
P/N Found:	K841P18				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 8 (Locking)					
P/N Found:	K841P19				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 9 (Wide & Narrow)					
P/N Found:	K107P01				
Qty Serviceable:	0	Qty Repairable:	62	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 9 (Locking)					
P/N Found:	K107P02				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 9 (Locking)					
P/N Found:	K107P03				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 10 (Wide & Narrow)					
P/N Found:	K043P25				
Qty Serviceable:	0	Qty Repairable:	60	Qty Scrap:	2
Overhaul					
Blade, HPCR Stage 10 (Locking)					
P/N Found:	K043P26				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 10 (Locking)					
P/N Found:	K043P27				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					

Blade, HPCR Stage 11 (Wide & Narrow)		
P/N Found: K144P17		
Qty Serviceable: 0	Qty Repairable: 72	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 11 (Locking)		
P/N Found: K144P18		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 11 (Locking)		
P/N Found: K144P19		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 12 (Wide & Narrow)		
P/N Found: K245P17		
Qty Serviceable: 0	Qty Repairable: 72	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 12 (Locking)		
P/N Found: K245P18		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 12 (Locking)		
P/N Found: K245P19		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 13 (Wide & Narrow)		
P/N Found: K326P01		
Qty Serviceable: 0	Qty Repairable: 72	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 13 (Locking)		
P/N Found: K326P02		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 13 (Locking)		
P/N Found: K326P03		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Blade, HPCR Stage 14 (Wide & Narrow)		
P/N Found: K427P01		
Qty Serviceable: 0	Qty Repairable: 72	Qty Scrap: 0
Overhaul		

Blade, HPCR Stage 14 (Locking)					
P/N Found:	K427P02				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 14 (Locking)					
P/N Found:	K427P03				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 15 (Wide & Narrow)					
P/N Found:	K547P38				
Qty Serviceable:	0	Qty Repairable:	72	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 15 (Locking)					
P/N Found:	K547P40				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 15 (Locking)					
P/N Found:	K547P42				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Bladc, HPCR Stage 16 (Wide & Narrow)					
P/N Found:	K648P34				
Qty Serviceable:	0	Qty Repairable:	72	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 16 (Locking)					
P/N Found:	K648P36				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Blade, HPCR Stage 16 (Locking)					
P/N Found:	K648P38				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Overhaul					
Adapter, Splined, Forward					
P/N Found:	9661M85P07	S/N: NRH57511			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Ring, Hub-Tie Support, Stages 11 - 12					
P/N Found:	9102M29G01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Clamp, Hub-Tie Support, Stages 11 - 12					
P/N Found:	9102M28P01				
Qty Serviceable:	5	Qty Repairable:	0	Qty Scrap:	0

Duct Assy, Air					
P/N Found:	L21787G06	S/N: CAN40560			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Shaft Assy, HPCR Rear					
P/N Found:	L21786G08	S/N: RPMCT012			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Repair Bearing Journal Areas					
Spool, HPCR Stages 3 - 9					
P/N Found:	9021M64P12	S/N: GWNC779			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Disk, HPCR Stage 10					
P/N Found:	9021M65P03	S/N: GAT8360J			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Diameter A			21.4357		
Diameter B			21.4371		
Diameter AC			22.3250		
Diameter AD			22.3245		
Spool, HPCR Stages 11 - 13					
P/N Found:	9021M66P03	S/N: RPMCV334			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Spool, HPCR Stages 14 - 16					
P/N Found:	9021M67P12	S/N: RPMCN915			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Ring, Hub-Tie Support					
P/N Found:	9644M07G01				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Clamp, Hub-Tie Support					
P/N Found:	9644M06P03				
Qty Serviceable:	5		Qty Repairable:	0	Qty Scrap: 0
Seal, Rotating Air, No. 4R Bearing (CDP)					
P/N Found:	9686M60G33	S/N: PURG0526			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Seal, Rotating Air Vent					
P/N Found:	9693M86P02	S/N: APV69316			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0

Nut, Rotating Air Seal					
P/N Found:	9645M92P04	S/N: MKA30926			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Sent for overhaul					
Retainer, Stage 2 Blade					
P/N Found:	9182M25P01				
Qty Serviceable:	24		Qty Repairable:	0	Qty Scrap: 2
Pitted					
Ring, Keyed Retaining					
P/N Found:	9607M01P03				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Spacer, Locknut Ring					
P/N Found:	9607M31P01				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Nut, #3 Brg Spanner					
P/N Found:	9644M33P04				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Ring, Adapter Retaining					
P/N Found:	9680M93P01				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Ring, Retaining - Keyed					
P/N Found:	9636M65P02				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
LM2500 HPC STATOR					
Stator Assembly, Compressor Front					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Stator Assembly, Compressor Rear					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Case, HPCS Front					
P/N Found:	9206M96G05	S/N: CDPL6235			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Case, HPCS Rear					
P/N Found:	9686M81G09	S/N: CDPT6720			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Vane, IGV					
P/N Found:	K001P07				
Qty Serviceable:	31		Qty Repairable:	0	Qty Scrap: 3
Pitted beyond limits					

Vane, Stage 1					
P/N Found: K172P01					
Qty Serviceable:	36	Qty Repairable:	0	Qty Scrap:	0
Vane, Stage 2					
P/N Found: K202P02					
Qty Serviceable:	39	Qty Repairable:	0	Qty Scrap:	0
P/N Found: K202P02					
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Impact damage					
Vane, Stage 3					
P/N Found: K344P03					
Qty Serviceable:	19	Qty Repairable:	0	Qty Scrap:	27
Pitted beyond limits					
Vane, Stage 4					
P/N Found: K445P03					
Qty Serviceable:	11	Qty Repairable:	0	Qty Scrap:	39
Pitted beyond limits					
Vane Stage 5					
P/N Found: K546P02					
Qty Serviceable:	28	Qty Repairable:	0	Qty Scrap:	30
Pitted beyond limits					
Vane, Stage 6					
P/N Found: K647P02					
Qty Serviceable:	57	Qty Repairable:	0	Qty Scrap:	7
Pitted beyond limits					
Vane, Stage 7 (Narrow & Wide)					
P/N Found: K779P49					
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	6
impact damaged					
P/N Found: K779P49					
Qty Serviceable:	0	Qty Repairable:	35	Qty Scrap:	0
Molydag required.					
P/N Found: K779P50					
Qty Serviceable:	0	Qty Repairable:	22	Qty Scrap:	0
Molydag required					
P/N Found: K779P50					
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	5
impact damaged					

Vane, Stage 7 Lower BSI					
P/N Found:	K779P51				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
MOLYDAG 213					
Vane, Stage 7 Upper BSI					
P/N Found:	K779P52				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
MOLYDAG 213					
Vane, Stage 7 LS Upper Case					
P/N Found:	K779P53				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
MOLYDAG 213					
Vane, Stage 7 RS Upper Case					
P/N Found:	K779P54				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
MOLYDAG 213					
Vane, Stage 8 (Narrow & Wide)					
P/N Found:	K109G01				
Qty Serviceable:	0	Qty Repairable:	30	Qty Scrap:	0
Molydag required					
P/N Found:	K109G08				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Molydag required					
Vane, Stage 8 RS Upper Case					
P/N Found:	K109G03				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
MOLYDAG 213					
Vane, Stage 8 LS Upper Case					
P/N Found:	K109G04				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
MOLYDAG 213					
Vane, Stage 9 (Narrow & Wide)					
P/N Found:	K980P24				
Qty Serviceable:	0	Qty Repairable:	31	Qty Scrap:	0
Molydag required					
P/N Found:	K980P23				
Qty Serviceable:	0	Qty Repairable:	41	Qty Scrap:	0
Molydag required					
Vane, Stage 9 LS Upper Case					
P/N Found:	K980P25				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					

Vane, Stage 9 RS Upper Case					
P/N Found:	K980P26				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 10 (Narrow & Wide)					
P/N Found:	K081P21				
Qty Serviceable:	0	Qty Repairable:	36	Qty Scrap:	1
Molydag required / impact damage					
P/N Found:	K081P22				
Qty Serviceable:	0	Qty Repairable:	39	Qty Scrap:	0
Molydag required					
Vane, Stage 10 Lower BSI					
P/N Found:	K081P23				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 10 Upper BSI					
P/N Found:	K081P24				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 10 LS Upper Case					
P/N Found:	K081P25				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 10 RS Upper Case					
P/N Found:	K081P26				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 11 (Narrow & Wide)					
P/N Found:	K182P49				
Qty Serviceable:	0	Qty Repairable:	36	Qty Scrap:	0
Molydag required					
P/N Found:	K182P50				
Qty Serviceable:	0	Qty Repairable:	40	Qty Scrap:	0
Molydag required					
Vane, Stage 11 Lower BSI					
P/N Found:	K182P51				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					

Vane, Stage 11 Upper BSI					
P/N Found:	K182P52				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 11 LS Upper Case					
P/N Found:	K182P53				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 11 RS Upper Case					
P/N Found:	K182P54				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 12 (Narrow & Wide)					
P/N Found:	K209P27				
Qty Serviceable:	0	Qty Repairable:	56	Qty Scrap:	0
Molydag					
P/N Found:	K209P28				
Qty Serviceable:	0	Qty Repairable:	20	Qty Scrap:	0
Molydag					
Vane, Stage 12					
P/N Found:	K209P29				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag					
Vane, Stage 12					
P/N Found:	K209P30				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag					
Vane, Stage 12					
P/N Found:	K209P31				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag					
Vane, Stage 12					
P/N Found:	K209P32				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag					
Vane, Stage 13					
P/N Found:	K310P21				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					

Vane, Stage 13					
P/N Found: K310P22					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 13					
P/N Found: K310P19					
Qty Serviceable:	0	Qty Repairable:	50	Qty Scrap:	0
Molydag required					
P/N Found: K310P20					
Qty Serviceable:	0	Qty Repairable:	28	Qty Scrap:	0
Molydag required					
Vane, Stage 14					
P/N Found: K412P39					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 14					
P/N Found: K412P40					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 14					
P/N Found: K412P41					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 14					
P/N Found: K412P42					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 14 (Narrow & Wide)					
P/N Found: K412P38					
Qty Serviceable:	0	Qty Repairable:	64	Qty Scrap:	0
Molydag required					
P/N Found: K412P37					
Qty Serviceable:	0	Qty Repairable:	20	Qty Scrap:	0
Molydag required					
Vane, Stage 15					
P/N Found: K513P33					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 15					
P/N Found: K513P34					
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					

Vane, Stage 15					
P/N Found:	K513P35				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 15					
P/N Found:	K513P36				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 15 (Narrow & Wide)					
P/N Found:	K513P22				
Qty Serviceable:	0	Qty Repairable:	19	Qty Scrap:	0
Molydag required					
P/N Found:	K513P31				
Qty Serviceable:	0	Qty Repairable:	29	Qty Scrap:	0
Molydag required					
P/N Found:	K513P32				
Qty Serviceable:	0	Qty Repairable:	36	Qty Scrap:	0
Molydag required					
Vane, Stage 16 (Narrow & Wide)					
P/N Found:	Illegible				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	10
alternate configuration					
P/N Found:	K688P19				
Qty Serviceable:	0	Qty Repairable:	48	Qty Scrap:	0
Molydag required					
P/N Found:	K688P20				
Qty Serviceable:	0	Qty Repairable:	50	Qty Scrap:	0
Molydag required					
Vane, Stage 16					
P/N Found:	K145G06				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Vane, Stage 16					
P/N Found:	K145G05				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Molydag required					
Shroud Assy, IGV					
P/N Found:	9211M10G01	S/N: PMIE7370			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Fwd and Aft halves misalligned					
P/N Found:	9211M10G01	S/N: PMIE5863			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Shroud Assy, Stage 1					
P/N Found:	9379M41G05	S/N: VAEW1743			
Qty Serviceable:	0		Qty Repairable:	0	Qty Scrap: 1
Fretted					
P/N Found:	9379M41G05	S/N: VAEN1617			
Qty Serviceable:	0		Qty Repairable:	0	Qty Scrap: 1
Warped					
Shroud Assy, Stage 2					
P/N Found:	9211M12G02	S/N: MLAC6650			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
P/N Found:	9211M12G02	S/N: VAEL1095			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Arm, Vane Actuation, IGV					
P/N Found:	9633M14G20				
Qty Serviceable:	9		Qty Repairable:	0	Qty Scrap: 21
Pin damaged					
Arm, Vane Actuation, IGV Splitline					
P/N Found:	9633M15G20				
Qty Serviceable:	3		Qty Repairable:	0	Qty Scrap: 1
Pin damaged					
Arm, Vane Actuation, S1					
P/N Found:	9633M14G21				
Qty Serviceable:	7		Qty Repairable:	0	Qty Scrap: 25
Pin damaged					
Arm, Vane Actuation, S1 Splitline					
P/N Found:	9633M15G21				
Qty Serviceable:	4		Qty Repairable:	0	Qty Scrap: 0
Arm, Vane Actuation, S2					
P/N Found:	9633M14G22				
Qty Serviceable:	28		Qty Repairable:	0	Qty Scrap: 8
Slot damaged					
Arm, Vane Actuation, S2 Splitline					
P/N Found:	9633M15G22				
Qty Serviceable:	4		Qty Repairable:	0	Qty Scrap: 0
Arm, Vane Actuation, S3					
P/N Found:	9633M14G23				
Qty Serviceable:	33		Qty Repairable:	0	Qty Scrap: 9
Slot damaged					
Arm, Vane Actuation, S3 Splitline					
P/N Found:	9633M15G23				
Qty Serviceable:	3		Qty Repairable:	0	Qty Scrap: 1
Bent					

Arm, Vane Actuation, S4		
P/N Found: 9633M19G03		
Qty Serviceable: 38	Qty Repairable: 0	Qty Scrap: 8
Slot damaged		
Arm, Vane Actuation, S4 Splitline		
P/N Found: 9633M20G03		
Qty Serviceable: 4	Qty Repairable: 0	Qty Scrap: 0
Arm, Vane Actuation, S5		
P/N Found: 9079M49G01		
Qty Serviceable: 44	Qty Repairable: 0	Qty Scrap: 6
Bent		
Arm, Vane Actuation, S5 Splitline		
P/N Found: 9125M65G02		
Qty Serviceable: 8	Qty Repairable: 0	Qty Scrap: 0
Arm, Vane Actuation, S6		
P/N Found: 9079M49G02		
Qty Serviceable: 49	Qty Repairable: 0	Qty Scrap: 7
Bent		
Arm, Vane Actuation, S6 Splitline		
P/N Found: 9125M65G04		
Qty Serviceable: 8	Qty Repairable: 0	Qty Scrap: 0
Ring Segment, IGV Actuation		
P/N Found: 1333M65G01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 2
Holes worn		
Ring Segment, Stage 1 Actuation		
P/N Found: 1333M65G02		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 2
Holes worn		
Ring Segment, Stage 2 Actuation		
P/N Found: 1333M65G03		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 2
Holes worn		
Ring Segment, Stage 3 Actuation		
P/N Found: 9295M30G05		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Paint		
Ring Segment, Stage 4 Actuation		
P/N Found: 9295M30G06		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
paint		

Ring Segment, Stage 5 Actuation		
P/N Found: 1333M65G06		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Paint		
Ring Segment, Stage 6 Actuation		
P/N Found: 1333M65G07		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Holes worn		
P/N Found: 1333M65G07		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Paint		
Mount, Actuation Lever		
P/N Found: 9084M24P02		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0
Plug, BSI (Stages IGV - 6)		
P/N Found: 1622M24P01		
Qty Serviceable: 7	Qty Repairable: 0	Qty Scrap: 0
Plug, BSI (Stages 7 - 11)		
P/N Found: 9686M80P01		
Qty Serviceable: 5	Qty Repairable: 0	Qty Scrap: 0
Liner, Vane Dovetail, RH		
P/N Found: 9073M97P13		
Qty Serviceable: 20	Qty Repairable: 0	Qty Scrap: 0
Liner, Vane Dovetail, LH		
P/N Found: 9073M97P14		
Qty Serviceable: 19	Qty Repairable: 0	Qty Scrap: 1
Refer to individual comments.		
Boot, Viton		
P/N Found: 1340M24P02		
Qty Serviceable: 27	Qty Repairable: 0	Qty Scrap: 3
Refer to individual comments.		
Clevis, Actuation, IGV - Stage 4		
P/N Found: 9349M73P02		
Qty Serviceable: 15	Qty Repairable: 0	Qty Scrap: 0
Push Rod, Actuation Lever		
P/N Found: 9137M30P01		
Qty Serviceable: 14	Qty Repairable: 0	Qty Scrap: 0
Push Rod, Actuation Lever (Feedback)		
P/N Found: 9607M83P02		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0

Spacer, Actuation Ring		
P/N Found: 9693M68G04		
Qty Serviceable: 40	Qty Repairable: 0	Qty Scrap: 16
Worn		
Dial, Position Variable Vane		
P/N Found: L21256G04		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Pointer, Position Dial		
P/N Found: L21257G01		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Sleeve, Aligning		
P/N Found: 9646M51P05		
Qty Serviceable: 104	Qty Repairable: 0	Qty Scrap: 6
Worn		
Alignment Sleeve, VSV Stg 3&4		
P/N Found: 9115M71P01		
Qty Serviceable: 96	Qty Repairable: 0	Qty Scrap: 0
Alignment Sleeves, VSV Stg 5&6		
P/N Found: 9115M70P02		
Qty Serviceable: 104	Qty Repairable: 0	Qty Scrap: 2
Worn		
Key, Casing, Left Side		
P/N Found: 9082M67P09		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Key, Casing, Right Side		
P/N Found: 9082M67P10		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Key, Casing, Left Side HPCS Aft Case		
P/N Found: 9173M47P04		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Key, Casing, Right Side, HPCS Aft Case		
P/N Found: 9173M47P03		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Sleeve, Lever Arm, Split Line		
P/N Found: 9174M78P02		
Qty Serviceable: 16	Qty Repairable: 0	Qty Scrap: 0
Nut, Hex -Actuation Lever Push Rod		
P/N Found: MS9201-04		
Qty Serviceable: 15	Qty Repairable: 0	Qty Scrap: 0

WASHER, FLAT		
P/N Found: MS9321-10		
Qty Serviceable: 55	Qty Repairable: 0	Qty Scrap: 1
Worn		
SPACER, STAGE IGV, 1 AND 2		
P/N Found: 9206M59P09		
Qty Serviceable: 9	Qty Repairable: 0	Qty Scrap: 2
Worn		
P/N Found: 9206M59P06		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
P/N Found: 9206M59P04		
Qty Serviceable: 4	Qty Repairable: 0	Qty Scrap: 0
P/N Found: 9206M59P11		
Qty Serviceable: 73	Qty Repairable: 0	Qty Scrap: 1
Worn		
P/N Found: 9206M59P10		
Qty Serviceable: 17	Qty Repairable: 0	Qty Scrap: 0
P/N Found: 9206M59P13		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
P/N Found: 9206M59P12		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 2
worn		
SPACER, VANE, 0.080-0.081 INCH THK		
P/N Found: 9206M61P07		
Qty Serviceable: 88	Qty Repairable: 0	Qty Scrap: 8
Worn		
Bracket, Fuel		
P/N Found: L34418G01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Fretted		
Bracket		
P/N Found: L21700P01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Fretted		
PLUG, MACHINE THREAD		
P/N Found: 9697M19P01		
Qty Serviceable: 3	Qty Repairable: 0	Qty Scrap: 0

LM2500 COMPRESSOR REAR FRAME

Frame, Compressor Rear
P/N Found:
Overhaul

Seal, CDP Stationary
P/N Found: 9174M68G02 S/N: TWGF3290
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
OVERHAUL, seals grooved, dim S oversized.

Diameter B	22.0839
Dimension H	0.1357
Dimension S	2.5985
Seal Surface B30F1	16.1589
Seal Surface B30F2	17.9576
Seal Surface B30F3	17.7531
Seal Surface B30F4	17.5526
Seal Surface B30F5	17.3551
Seal Surface B30F6	17.1587

Seal Assy, Fwd. Vent Air Stationary
P/N Found: L44540G01 S/N: TRIP0295
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0
B72F1 and B72F2 a little small. .003 and .002

Diameter B	19.1100
Dimension X	2.9750
Dimension Y	3.0360
Dimension Z	0.1080
Seal Surface B56F1	12.5300
Seal Surface B56F2	12.3280
Seal Surface B72F1	10.3800
Seal Surface B72F2	10.2810

Heat Shield, No. 4R Bearing
P/N Found: L44596P01
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Seal, No. 4R Brg. Fwd. Stationary Air
P/N Found: 9686M44P03 S/N: MMTC8210
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Repair rubstrip

Seal, No. 4R Brg. Stationary Oil
P/N Found: 9693M48P04 S/N: MMTC9158
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Repair rubcoat

Bearing, No. 4 Roller
P/N Found: 1959M21P01 S/N: TBCLL202
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 1
Replaced on Overhaul

Housing, No. 4B Bearing					
P/N Found:	9646M10P03	S/N: APV66833			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter DA		10.4820			
Diameter DF		9.2374			
Diameter DG		10.4739			
Bearing, No. 4 Ball					
P/N Found:	9648M01P14	S/N: MRCCB500			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Seal, No. 4R Brg. Stationary Oil					
P/N Found:	9693M49P03	S/N: MMTC8952			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Overhaul Seal Surface					
Insulation Blanket, No. 4R Brg. Fwd.					
P/N Found:	L44594P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Insulation Blanket, No. 4R Brg. Fwd.					
P/N Found:	L44593P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Insulation Blanket, No. 4B Brg. Aft					
P/N Found:	L44595P01				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Seal, No. 4 Brg. Aft Stationary Air					
P/N Found:	9693M04P02	S/N: MMT09173			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
DIAMETER E. 0.004 SMALL					
Seal Surface B25F		8.4720			
Dimension Y		8.4244			
Diameter E		12.1930			
Nut, 4B Brg Retainer					
P/N Found:	9645M84P02				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair silver plate					
Seal Assy, No. 4 Outer Stationary Air					
P/N Found:	L44541G01	S/N: TKIP5894			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Assy, Aft Stationary Air					
P/N Found:	9693M20G11	S/N: TWGF3312			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
SHROUD SEAL WORN					

Borescope Plug					
P/N Found:	9135M62P01				
Qty Serviceable:	6	Qty Repairable:	0	Qty Scrap:	0
Oil Nozzle, #4 Brg Lube					
P/N Found:	9628M93P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter, Ignitor Plug					
P/N Found:	9016M48P03				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Re-silver					
LM2500 TURBINE MID-FRAME, P					
Frame, Turbine Mid-					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Support, LPT Nozzle, Stage 1					
P/N Found:	9102M54G05	S/N: ILLEGIBLE			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Cracked					
Seal Assy, Cooling & Vent Stationary Air					
P/N Found:	9633M62G18	S/N: ILLEGIBLE			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Seal Damaged					
Heat Shield, No. 5 Brg. Stat. Air / Oil					
P/N Found:	9662M78G08				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Insulation Blanket, C-Sump Fwd.					
P/N Found:	9083M76P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing, No. 6 Roller					
P/N Found:	1959M24P01	S/N: TBCML087			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Seal, No. 5 Brg. Stationary Air / Oil					
P/N Found:	L24587G03	S/N: FCPFA506			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Overhaul Seal Surfaces					
Bearing, No. 5 Roller					
P/N Found:	1959M23P01	S/N: TBCMA248			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					

Seal, No. 6 Bearing, Stationary Air/Oil					
P/N Found:	L24588G01	S/N: MMTD5578			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Surface A		6.6890			
Seal Surface B		8.5160			
Diameter DC		9.1405			
Seal Assembly, Vent Stationary					
P/N Found:	9127M42G05	S/N: CLM38852			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Seal surface F worn and Diameter C is too small.					
Diameter C		16.2590			
Bracket Assy, Vent Seal					
P/N Found:	L25750G01				
Qty Serviceable:	5	Qty Repairable:	0	Qty Scrap:	0
Insulation Blanket, Aft C-Sump Top					
P/N Found:	9084M68P06				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal, TMF Aft Outer					
P/N Found:	9084M71P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Assembly, Stage 1 LPT					
P/N Found:	9632M71G04	S/N: JEG60494			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Heat Shield, No. 6 Brg.					
P/N Found:	9084M67G04				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Lock Plate, #5R Brg					
P/N Found:	9081M82P03				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Retainer, Inner Stg 1 Nozzle					
P/N Found:	9688M08P02				
Qty Serviceable:	12	Qty Repairable:	0	Qty Scrap:	2
Failed NDT					
Oil Nozzle, #5 Brg Lube					
P/N Found:	9662M15P05				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

LM2500 INLET GEARBOX

Gearbox, Inlet					
P/N Found:	L21082G10	S/N: EPE80065			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nozzle, Oil, Inlet Gearbox					
P/N Found:	9686M92G02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
SB LM2500-IND-160					
Bearing, Cylindrical Roller					
P/N Found:	9600M78P01	S/N: MDA3389K			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Roller Bearing					
P/N Found:	9601M43P01	S/N: N/A			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.4693"					
Diameter ID		3.3462			
Diameter OD		3.4670			
Gearshaft Assy, Bevel, Radial					
P/N Found:	*9609M89P11*	*S/N: AGH36326*			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Retainer, Duplex Bearing					
P/N Found:	9634M08P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing, Duplex, Thrust, Ball					
P/N Found:	9600M76P07	S/N: MDA4225A			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Gearshaft Bearing					
P/N Found:	9601M42P01	S/N: N/A			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter ID		3.3467			
Diameter OD		3.4671			
Adapter Assembly, Inlet Gearbox					
P/N Found:	9009M42G01	S/N: CTM03483			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter DA		3.4686			
Diameter DB		5.4220			

Gearshaft Assembly, Inlet Gearbox					
P/N Found:	9634M92P14	S/N: N/A			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Aft Support Journal Diameter		5.7171			
Bearing Journal Diameter		5.9066			
P/N Found:	9600M95P03	S/N: EGC00798			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Splines fretted					
Aft Support Journal Diameter		5.7171			
Bearing Journal Diameter		5.9066			
Bearing, Thrust, Duplex Ball					
P/N Found:	9634M10P06	S/N: MDA484FT			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Retainer, Ball Bearing					
P/N Found:	9634M47P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nut, Plain					
P/N Found:	L43680G02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Housing Assembly, Inlet Gearbox					
P/N Found:	9009M43G10	S/N: BRA12355			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter DA		5.4191			
Diameter DE		3.4676			
Nozzle, Gearshaft Oil					
P/N Found:	9601M49P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
IGB Roller Bearing Retainer					
P/N Found:	9601M52P02				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Spanner Nut					
P/N Found:	9601M36P02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn					
#3 Brg Oil Nozzle					
P/N Found:	9601M50P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Shim, Laminated					
P/N Found:	9601M53G01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Shim, Laminated					
P/N Found:	9601M54G02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
BOLT, MACHINE					
P/N Found:	R1394P015				
Qty Serviceable:	10	Qty Repairable:	0	Qty Scrap:	2
Worn					
LM2500 ACCESSORY GEARBOX					
Gearbox, Accessory/Transfer (Module)					
P/N Found:	L21441G26	S/N: EPE80065			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Housing Assy, Accessory Gear Transfer					
P/N Found:	L21391G04	S/N: FIAE1068			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Diameter L		9.2084			
Bearing Diameter V		2.9951			
Bearing Diameter X		2.9951			
Adapter Diameter U		7.0066			
Adapter Diameter M		5.5251			
Bearing Diameter GL		2.9953			
Adapter Diameter T		6.2560			
Bearing Diameter GV		3.3120			
Adapter Diameter P		9.2085			
Bearing Diameter HC		2.9955			
Adapter Diameter S		8.0079			
Bearing Diameter HB		2.8394			
Cover, Air/Oil Separator					
P/N Found:	9634M44P06				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter B		7.5017			
Seal Surface DB		4.0236			
Seal Surface DC		3.7159			
Housing Assembly, Air/Oil Separator					
P/N Found:	L21439G02	S/N: WIN3926E			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Diameter A		2.8000			
Pilot Diameter B		7.7066			
Pilot Bore Diameter D		7.5050			
Impeller Assembly, Air/Oil Separator					
P/N Found:	9671M87G05	S/N: KSBK1361			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Inner Seal		3.9990			
Outer Seal		3.7010			

Housing Assembly, Bevel Gear					
P/N Found:	L21412G03	S/N: FIA23826A3460			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Rabbet Diameter F		5.8772			
Bearing Diameter G		3.3105			
Rabbet Diameter B		8.2607			
Bearing Diameter C		3.9003			
Cover Assembly, Radial					
P/N Found:	L21416G01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Cover, Horizontal					
P/N Found:	L21417P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Assembly, Radial					
P/N Found:	L21414G01	S/N: FIA12284			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Rabbet Diameter B		5.8810			
Bearing Diameter C		3.5085			
Retainer, Bearing					
P/N Found:	9699M88P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Housing, Duplex Bearing					
P/N Found:	9699M87P01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.5088"					
Diameter ID		3.3458			
Diameter OD		3.5063			
Gearshaft, 29-Tooth Bevel					
P/N Found:	L21421P02	S/N: FIA19117			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Tooth damaged					
Bearing, Roller					
P/N Found:	9699M14P01	S/N: MDA8078U			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing Assy, Bevel & Accessory Gear					
P/N Found:	L21404G02	S/N: FIA20894			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Diameter AA		3.7052			
TGB Adapter Diameter U		5.9966			
Rabbet Diameter G		8.2677			
Adapter Diameter Z		9.2080			

Shaft, Horizontal Drive					
P/N Found:	L21429P02	S/N: FIA08234			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Assembly, Horizontal					
P/N Found:	L21415G01	S/N: FIA2300			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Diameter G		5.9960			
Bearing Diameter H		4.4927			
Bearing, Duplex Ball					
P/N Found:	9009M45P03	S/N: MDA899D3			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Duplex Ball Bearing					
P/N Found:	9009M49P01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 4.4938"					
Diameter ID		4.3302			
Diameter OD		4.4905			
Retainer, Bearing					
P/N Found:	9009M50P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Gearshaft, 45-Tooth Bevel					
P/N Found:	9009M90P04	S/N: FIA24932			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Housing, Roller Bearing					
P/N Found:	9699M82P02				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.9025"					
Diameter ID		3.7341			
Diameter OD		3.8991			
Bearing, Cylindrical Roller					
P/N Found:	9699M15P01	S/N: MDA2479V			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Retainer, Bearing					
P/N Found:	9699M83P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nozzle, Lube					
P/N Found:	L21410P01	S/N: NOT SERIALIZED			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Adapter Assembly, Main Fuel Pump					
P/N Found:	L21393G01	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Diameter A		3.7044			
Adapter Diameter B		8.0059			
F-Pump Diameter D		5.8803			
Bearing, Annular Ball					
P/N Found:	9699M09P02	S/N: MDA744YN			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Bearing					
P/N Found:	9699M65P17	S/N: A			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.7036"					
Diameter ID		3.5426			
Diameter OD		3.7005			
P/N Found:	9699M65P17	S/N: B			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.7036"					
Diameter ID		3.5427			
Diameter OD		3.7001			
Retainer, Bearing					
P/N Found:	9699M95P04				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Gearshaft Assembly, 77-Tooth Spur					
P/N Found:	L21423P02	S/N: FIA18904			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing, Roller					
P/N Found:	9699M04P01	S/N: MDA5684S			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Bearing					
P/N Found:	9699M65P15				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.8385"					
Diameter ID		2.6765			
Diameter OD		2.8365			
Nozzle Assembly, Oil					
P/N Found:	L21402G01	S/N: NOT SERIALIZED			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Bearing, Ball					
P/N Found: 9699M09P01	S/N: MDAB464				
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Gearshaft, 89-Tooth Spur					
P/N Found: L21424P02	S/N: FIA19271				
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0
Bearing, Cylindrical Roller					
P/N Found: 9699M03P01	S/N: MDAHN552				
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
P/N Found: 9699M03P01	S/N: MDA0976S				
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
P/N Found: 9699M03P01	S/N: MDACM874				
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
P/N Found: 9699M03P01	S/N: MDACM711				
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Bearing					
P/N Found: 9699M65P23	S/N: A				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.9944"					
Diameter ID		2.8340			
Diameter OD		2.9924			
P/N Found: 9699M65P23	S/N: B				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.9944"					
Diameter ID		2.8342			
Diameter OD		2.9924			
P/N Found: 9699M65P23	S/N: C				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.9944"					
Diameter ID		2.8340			
Diameter OD		2.9923			
P/N Found: 9699M65P23	S/N: D				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.9944"					
Diameter ID		2.8340			
Diameter OD		2.9926			
P/N Found: 9699M65P23	S/N: E				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.9944"					
Diameter ID		2.8338			
Diameter OD		2.9923			

Adapter Assembly, Starter					
P/N Found:	L21395G02	S/N: FIA22023			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Diameter A		3.6634			
Rabbet Diameter C		3.0690			
Adapter Diameter B		6.2555			
Retainer, Seal					
P/N Found:	9699M98P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing, Annular Ball					
P/N Found:	9601M01P06	S/N: MDAGF385			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Bearing					
P/N Found:	9601M71P02				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.6619"					
Diameter ID		3.5440			
Diameter OD		3.6596			
Retainer, Bearing					
P/N Found:	9699M95P11				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Gearshaft, 47-Tooth Spur					
P/N Found:	L21425P02	S/N: FIA20179			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing, Roller					
P/N Found:	9600M91P05	S/N: MDA8566M			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Housing, Bearing					
P/N Found:	9699M92P02				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.3111"					
Diameter ID		3.1488			
Diameter OD		3.3085			
Nozzle Assembly, Oil					
P/N Found:	L21408G02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Assembly, Idler					
P/N Found:	9699M34G04	S/N: FIA01046			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Diameter A		3.3112			
Rabbet Diameter B		5.5230			

Housing, Bearing					
P/N Found:	9699M65P20				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.3096"					
Diameter ID		3.1488			
Diameter OD		3.3072			
Bearing, Annular Ball					
P/N Found:	9699M12P01	S/N: MDACT542			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Retainer, Bearing					
P/N Found:	9699M95P09				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Gearshaft, 52-Tooth Spur					
P/N Found:	L21422P02	S/N: FIA19682			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Assembly, Manual Drive					
P/N Found:	L21397G03	S/N: FIA21534			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Diameter A		2.9950			
Adapter Diameter B		7.0055			
Bearing, Annular Ball					
P/N Found:	9699M06P01	S/N: MDA7977S			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Retainer, Bearing					
P/N Found:	9699M95P08				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Gearshaft, 67-Tooth Spur					
P/N Found:	L31056P01	S/N: FIA14465			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Impact damage on tooth					
Housing, Bearing					
P/N Found:	9671M56P01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 2.7992"					
Diameter ID		2.6772			
Diameter OD		2.7976			
Bearing, Annular Ball					
P/N Found:	9699M11P01	S/N: MDA1128Y			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					

Retainer, Bearing					
P/N Found:	9699M95P10				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Gearshaft, 77-Tooth Spur					
P/N Found:	L21427P02	S/N: FIAAE2KM			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Adapter Assembly, Air/Oil Separator					
P/N Found:	L21401G02	S/N: FIAAE950			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Rabbet Diameter B		9.2097			
Pilot Diameter D		7.0065			
Nozzle Assembly, Oil					
P/N Found:	L21407G02	S/N: NOT SERIALIZED			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing Housing TGB					
P/N Found:	9699M80P02				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair to a target OD of: 3.3116"					
Diameter ID		3.1488			
Diameter OD		3.3089			
Shim, Laminated					
P/N Found:	L21432P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Shim, Laminated					
P/N Found:	L21433P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bearing, Duplex, Thrust, Ball					
P/N Found:	9600M76P07	S/N: MDA4224A			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Shaft, Radial Drive					
P/N Found:	9609M97P05				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Chipped / fretted splines					
Seal Assembly, Shaft					
P/N Found:	L21431G02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Cover, Fuel pump					
P/N Found:	L21440P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Mount Bracket					
P/N Found:	L21409P02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Fretted					
Mount Bracket					
P/N Found:	L21418G01				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Speed Sensor, Electro Magnetic					
P/N Found:	L21131P02				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Gearbox Bearing Retainer					
P/N Found:	9699M81P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nut, Spanner, Self-Locking					
P/N Found:	9009M51P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Plate,Cover					
P/N Found:	L21398P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Spanner Nut					
P/N Found:	9009M53P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
BUSHING, SLEEVE					
P/N Found:	9116M37P01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
worn					
LM2500 GT FINAL ASSEMBLY					
Actuator, Variable Stator					
P/N Found:	9691M29P25	S/N: APMUF211			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
P/N Found:	9691M29P25	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bellcrank					
P/N Found:	L43567G02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Bushing worn					
Pump, Lube & Scavenge					
P/N Found:	L24407P02	S/N: LJA32609			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Overhaul					

Nozzle, Natural Gas Fuel					
P/N Found:	L31421P03				
Qty Serviceable:	0	Qty Repairable:	30	Qty Scrap:	0
Overhaul					
Ring, Keyed Retaining, #5 Brg Oil Tube to Shaft					
P/N Found:	9661M56P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nut, No. 5 Brg. Inner Race					
P/N Found:	9671M28P01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Dented					
Spacer, Radial Drive Shaft					
P/N Found:	L21434P02	S/N: ADCO6221			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Cover, HPT Bolt					
P/N Found:	9104M38P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Lever Assy, Vane Actuation					
P/N Found:	9673M66G14				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
P/N Found:	9673M66G15				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bracket, VSV Actuator					
P/N Found:	9080M96G10				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Bolt, VSV Bellcrank					
P/N Found:	9630M72P02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn					
Nut, No. 4 Brg. Spline Split					
P/N Found:	9346M79G05	S/N: CAV35703			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Scrap at overhaul.					
Seal, No. 4 Brg. Rotating Air/Oil					
P/N Found:	9693M05P02	S/N: APV63964			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
ID GOUGED					
Diameter E		8.4263			
Diameter F		7.0863			

Cable, Feedback					
P/N Found:	L21693P02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Fretted worn					
Seal, No. 4R Brg. Rotating Oil					
P/N Found:	9602M47P09	S/N: NOT SER			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Serration		7.0830			
Inner Diameter		6.6266			
Baffle, Compressor Rear Frame					
P/N Found:	9693M57G01	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Ring, Splined Lock					
P/N Found:	9693M33P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Collar, Split Nut					
P/N Found:	9346M80P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal, #4 Bearing Rotating Outer Air					
P/N Found:	9693M02P03	S/N: PMB58403			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Sent out for Diameter B resurfacing.					
Diameter B		6.6075			
Diameter K		7.2730			
Diameter L		0.8730			
Seal Serration C		8.1110			
Seal Serration D		8.2720			
Seal Serration E		8.4320			
Seal Serration F		8.5910			
Seal Serration G		8.7521			
Seal Serration H		8.9121			
Heat Shield, No. 4 Brg. Stat. Air Seal					
P/N Found:	9693M06P04				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Dented beyond limits					
Plug Assy, Stage 1 BSI					
P/N Found:	9103M85G02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Plug Assy, Stage 2 BSI					
P/N Found:	9630M15P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0

Rod-End Assembly (LH-Thread)					
P/N Found:	L31302G02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	2
Worn					
Rod-End Assembly (RH-Thread)					
P/N Found:	L31302G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	2
Worn					
Link, RH-Mount					
P/N Found:	L31303G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn					
Mount, Link					
P/N Found:	L21419P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Mount, Link					
P/N Found:	L21419P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Support, CRF					
P/N Found:	9687M09G08	S/N: JEGPO662			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Tube Assy, Oil Cap					
P/N Found:	L14469G03	S/N: CAN40493			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair Mating Diameters					
Sleeve, Damper					
P/N Found:	9079M28G05				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Assembly, LPT Stationary					
P/N Found:	9046M15G18	S/N: RAE40118			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Honeycomb worn beyond limts.					
Diameter B		14.9950			
Seal, No. 6 Bearing, Rotating Oil					
P/N Found:	9658M82P01	S/N: APV89927			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter B		6.6800			
Inner Diameter A		5.9056			
Nozzle, LPT Stage 1					
P/N Found:	L21751G01	S/N: N/A			
Qty Serviceable:	0	Qty Repairable:	14	Qty Scrap:	0
Overhaul					

IGV Actuation Ring Connecting Link
P/N Found: 9051M50G04
Qty Serviceable: 2 Qty Repairable: 0 Qty Scrap: 0

Stg 1 Actuation Ring Connecting Link
P/N Found: 9051M51G04
Qty Serviceable: 2 Qty Repairable: 0 Qty Scrap: 0

Stg 2 Actuation Ring Connecting Link
P/N Found: 9051M52G03
Qty Serviceable: 0 Qty Repairable: 2 Qty Scrap: 0
Re-coat

Stg 3 Actuation Ring Connecting Link
P/N Found: 9051M53G04
Qty Serviceable: 0 Qty Repairable: 2 Qty Scrap: 0
Re-coat

Stg 4 Actuation Ring Connecting Link
P/N Found: 9051M54G04
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 1
Fretted/ Re-coat

Stg 5 Actuation Ring Connecting Link
P/N Found: 9051M55G04
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 2
Bolt hole elongation

Stg 6 Actuation Ring Connecting Link
P/N Found: 9051M56G04
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 2
Bolt hole elongation

Pin, VSV Connecting Link
P/N Found: 9627M62P02
Qty Serviceable: 15 Qty Repairable: 0 Qty Scrap: 13
Worn

Plug, Instrumentation, TMF
P/N Found: 9103M46P01
Qty Serviceable: 4 Qty Repairable: 0 Qty Scrap: 0

Mount, AGB
P/N Found: L21400G01
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Bushing Assy, Expandable
P/N Found: 9681M48P06
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 1
Worn

Nut, Expandable Bushing, Splined					
P/N Found:	J198P08C				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Bolt, Shear, AGB Mount					
P/N Found:	J431P124A				
Qty Serviceable:	4	Qty Repairable:	0	Qty Scrap:	0
Bolt, Shear, AGB Mount					
P/N Found:	J431P125A				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nut, Self-Locking AGB Mount					
P/N Found:	9610M50P15				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
P/N Found:	9610M50P27				
Qty Serviceable:	3	Qty Repairable:	0	Qty Scrap:	0
Bracket, VSV Bellcrank					
P/N Found:	9647M81G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Damaged					
Shield, Spray CRF					
P/N Found:	9033M91G02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Damaged					
Bracket, Spray Shield					
P/N Found:	9014M99G03				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Damaged					
Cover, Sump (IGB)					
P/N Found:	L21561P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
MANIFOLD ASSY, ACTUATOR DRAIN					
P/N Found:	L21633G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	2
Worn					
TUBE ASSY, RIGHT SIDE GAS TURBINE FUEL DRAIN.					
P/N Found:	L21609G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn					
TUBE ASSY, HEAD-END					
P/N Found:	L21604G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn					

TUBE ASSY, RIGHT SIDE GAS TURBINE ROD END					
P/N Found:	L21610G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn					
BRACKET, ANGLE.					
P/N Found:	9011M82G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
worn/ fretted					
BRACKET, HINGED					
P/N Found:	L34447G01				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	2
worn/ fretted					
BRACKET, HINGED					
P/N Found:	L34448G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	3
worn/ fretted					
BRACKET, ANGLE					
P/N Found:	L46354G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
worn/ fretted					
BRACKET.					
P/N Found:	L24044P02				
Qty Serviceable:	4	Qty Repairable:	0	Qty Scrap:	1
worn/ fretted					
BRACKET, ACCELEROMETER, AFT					
P/N Found:	L34235G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
worn/ fretted					
TUBE, C AND D SUMPS VENT AIR.					
P/N Found:	L21445G01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
worn/ fretted					
MANIFOLD ASSY, OIL.					
P/N Found:	L21486G01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
worn/ fretted					
MANIFOLD, FUEL-SECONDARY (RIGHT SIDE).					
P/N Found:	L34693G02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
fretted					

MANIFOLD, FUEL-PRIMARY (RIGHT SIDE)		
P/N Found: L34692G02		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
fretted		
MANIFOLD, FUEL-PRIMARY (LEFT SIDE)		
P/N Found: L34692G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
fretted		
MANIFOLD, FUEL-SECONDARY (LEFT SIDE)		
P/N Found: L34693G01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
fretted		
NOZZLE, EJECTOR - SEAL PRESSURE , SUMP.		
P/N Found: L21442G04		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
MANIFOLD ASSY, AIR.		
P/N Found: L24352G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
MANIFOLD, AIR, B, C, AND D SUMP VENT.		
P/N Found: L21447G02		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE, OIL - C SCAVENGE		
P/N Found: L42088G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE, AIR		
P/N Found: L24380G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE, OIL - D SUMP SCAVENGE		
P/N Found: L24371G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE, AIR		
P/N Found: 9144M34G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
repair threaded coupling end		

TUBE, OIL - C SCAVENGE		
P/N Found: L34860G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
MANIFOLD, OIL - C AND D SUPPLY		
P/N Found: L34864G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE, OIL - D SCAVENGE.		
P/N Found: L42094G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE ASSY, AIR.		
P/N Found: L24356G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE ASSY , AIR.		
P/N Found: L24376G01		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
worn / fretted		
TUBE AIR/ OIL SEPARATOR		
P/N Found: L21468G01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
worn / fretted		
MANIFOLD OIL LUBE PUMP SPLINE...		
P/N Found: L21564G01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
worn / fretted		
HOSE ASSY MED PRESS, W/ FIRE SHIELD		
P/N Found: R5077B090B		
Qty Serviceable: 1	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
P/N Found: R5078B172B		
Qty Serviceable: 1	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
HOSE		
P/N Found: R5082D300A000		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
HOSE		
P/N Found: R5077E614B		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		

HOSE		
P/N Found: R5078F484A		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
HOSE		
P/N Found: R5082E300A000		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
HOSE		
P/N Found: R5095J171B		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
HOSE		
P/N Found: R5077J110D		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
HOSE		
P/N Found: R5077J165B		
Qty Serviceable: 0	Qty Repairable: 1	Qty Scrap: 0
Fire shield to be repaired		
BRACKET		
P/N Found: L24373P001A		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Worn/ fretted		
PLATE COVER		
P/N Found: 9636M51P03		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Worn/ fretted		
BRACKET, TUBE - RECOUP		
P/N Found: L21520P01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Worn/ fretted		
BRACKET, MANIFOLD - HPT COOLING		
P/N Found: L21522P01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Worn/ fretted		
BRACKET, C SCAV		
P/N Found: L21387P03		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Worn/ fretted		

BRACKET					
P/N Found:	L24436P001A				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn/ fretted					
BRACKET					
P/N Found:	L21642P01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn/ fretted					
U-BOLT					
P/N Found:	L24435P01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn/ fretted					
U-BOLT					
P/N Found:	L24435P02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn/ fretted					
MANIFOLD, AIR - LOW PRESSURE TURBINE. . . . . COOLING, RIGHT SIDE					
P/N Found:	L24306G01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Worn/ fretted					
MANIFOLD, FUEL-PRIMARY.					
P/N Found:	L34714G01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Worn/ fretted					
MANIFOLD ASSY, FUEL-SECONDARY (SECONDARY . . FLOW)					
P/N Found:	L34434G01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Fretted					
TUBE, AIR - HIGH PRESSURE TURBINE COOLING . . (INITIAL CONFIGURAT					
P/N Found:	9013M51G01				
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Worn/ fretted					
TUBE, OIL - B SUMP.					
P/N Found:	L34749G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn/ fretted					
TUBE, OIL STIG AND NON-STIG APPLICATIONS.					
P/N Found:	L24316G01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Worn/ fretted					

C-SUMP OIL SUPPLY
P/N Found: L24342G03
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Worn/ fretted

LM2500 COMBUSTOR

Combustor
P/N Found: 9101M29G73 S/N: ALF00100
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Overhaul

Bolt, Combustor Pin
P/N Found: 9713M26P05
Qty Serviceable: 0 Qty Repairable: 10 Qty Scrap: 0
Overhaul

LM2500 HPT ROTOR, SINGLE

Rotor Assy, HPT
P/N Found: Illegible S/N: APV69477
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Blade, HPTR Stage 1
P/N Found: CH-6783-15P S/N: 00004
S/N: 00005
S/N: 00012
S/N: 00013
S/N: 00014
S/N: 00015
S/N: 00069
S/N: 00074
S/N: 00076
S/N: 00077
S/N: 00095
S/N: 00097
S/N: 00098
S/N: 00099
S/N: 00100
S/N: 00106
S/N: 00111
S/N: 00112
S/N: 00113
S/N: 00115
S/N: 00119
S/N: 00121
S/N: 00123
S/N: 00124
S/N: 00125
S/N: 00126
S/N: 00162
S/N: 00163
S/N: 00164
S/N: 00166

S/N: 00173
S/N: 00174
S/N: 00181
S/N: 00182
S/N: 00183
S/N: 00196
S/N: 00197
S/N: 00200
S/N: 00201
S/N: 00204
S/N: 00210
S/N: 00211
S/N: 00216
S/N: 00217
S/N: 00219
S/N: 00220
S/N: 00222
S/N: 00224
S/N: 00225
S/N: 00253
S/N: 00254
S/N: 00256
S/N: 00257
S/N: 00273
S/N: 00276
S/N: 00282
S/N: 00283
S/N: 00355
S/N: 00358
S/N: 00361
S/N: 00363
S/N: 00367
S/N: 00386
S/N: 00387
S/N: 00388
S/N: 00389
S/N: 00390
S/N: 00410
S/N: 00412
S/N: 00414
S/N: 00435
S/N: 00436
S/N: 00437
S/N: 00458
S/N: 00459
S/N: 00460
S/N: 01386
S/N: 01636
S/N: 01637
S/N: 01643
S/N: 01647
S/N: 01648
S/N: 01737

	S/N: 01742		
	S/N: 01759		
	S/N: 01765		
	S/N: 01769		
	S/N: 01778		
Qty Serviceable: 0		Qty Repairable: 0	Qty Scrap: 88
overhaul			
Blade, HPTR Stage 2			
P/N Found: CH-6784-15P	S/N: 03248		
	S/N: 03249		
	S/N: 03252		
	S/N: 03253		
	S/N: 03286		
	S/N: 03287		
	S/N: 03288		
	S/N: 03289		
	S/N: 03290		
	S/N: 03291		
	S/N: 03293		
	S/N: 03294		
	S/N: 03295		
	S/N: 03296		
	S/N: 03300		
	S/N: 03302		
	S/N: 03303		
	S/N: 03304		
	S/N: 03310		
	S/N: 03311		
	S/N: 03312		
	S/N: 03313		
	S/N: 03320		
	S/N: 03321		
	S/N: 03322		
	S/N: 03323		
	S/N: 03324		
	S/N: 03326		
	S/N: 03352		
	S/N: 03353		
	S/N: 03354		
	S/N: 03355		
	S/N: 03356		
	S/N: 03357		
	S/N: 03358		
	S/N: 03359		
	S/N: 03413		
	S/N: 03414		
	S/N: 03415		
	S/N: 03416		
	S/N: 03417		
	S/N: 03418		
	S/N: 03419		
	S/N: 03422		

	S/N: 03423		
	S/N: 03424		
	S/N: 03425		
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	S/N: 03427		
	S/N: 03429		
	S/N: 03430		
	S/N: 03432		
	S/N: 03433		
	S/N: 03434		
	S/N: 03446		
	S/N: 03447		
	S/N: 03449		
	S/N: 03453		
	S/N: 03454		
	S/N: 03455		
	S/N: 03456		
	S/N: 03457		
	S/N: 03458		
	S/N: 03459		
	S/N: 03460		
	S/N: 03466		
	S/N: 03467		
	S/N: 03468		
	S/N: 03469		
	S/N: 03477		
	S/N: 03478		
	S/N: 03547		
	S/N: 03548		
	S/N: 03549		
	S/N: 03550		
	S/N: 03551		
	S/N: 03553		
	S/N: 03554		
	S/N: 03555		
	S/N: 03556		
	S/N: 03561		
	S/N: 03562		
	S/N: 03582		
	S/N: 03583		
	S/N: 03584		
	S/N: 03585		
	S/N: 03588		
	S/N: 03589		
	S/N: 03590		
	S/N: 03591		
Qty Serviceable: 0		Qty Repairable: 0	Qty Scrap: 90
Overhaul			
Retainer, Stage 1 HPT			
P/N Found: 9264M54P02	S/N: N/A		
Qty Serviceable: 1		Qty Repairable: 0	Qty Scrap: 0

Shaft Assy, HPT Fwd.					
P/N Found:	9208M78G09	S/N: CAV35073			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Restor seal serations to nomial values. Hardness test Required					
Diameter E		25.7035			
Seal Serration G1		7.9149			
Seal Serration G2		8.0814			
Seal Serration G3		8.2437			
Seal Serration G4		8.4027			
Seal Serration G5		8.5618			
Seal Serration G6		8.7208			
Disk, HPTR Stage 1					
P/N Found:	9208M81P06	S/N: ATW16442			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Eddy Current Inspection					
Damper Assy, Stage 1					
P/N Found:	9190M39G07				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Damaged					
P/N Found:	9190M39G07				
Qty Serviceable:	87	Qty Repairable:	0	Qty Scrap:	0
Spacer, HPTR					
P/N Found:	L31425P01	S/N: XAE01903			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Dia C undersized					
Diameter B		23.4420			
Diameter C		14.8788			
Dimension D		2.8117			
Shield Assy, HPT Thermal					
P/N Found:	L25734G04	S/N: LGH07956			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Seal serations damaged					
Diameter AA		24.6983			
Diameter AM		23.4387			
Diameter H		25.8032			
Surface AG to Surface AP		2.6127			
Seal Serration V1		27.2776			
Seal Serration V2		27.1283			
Seal Serration V3		26.9658			
Seal Serration V4		26.7203			
Disk, HPTR Stage 2					
P/N Found:	L25451P05	S/N: ATW16195			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Eddy Current Inspection					

Retainer, Stage 2 HPT					
P/N Found:	9208M83P02	S/N: NCE2966B			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Damper Assy, Stage 2					
P/N Found:	9190M41G04				
Qty Serviceable:	88	Qty Repairable:	0	Qty Scrap:	2
Refer to individual comments.					
Shaft Assy, HPTR Rear					
P/N Found:	L31305G01	S/N: APV69477			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Scoring inside bore					
Adapter, Pressure Tube					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Overtorque Damage					
HPT Pressure Tube					
P/N Found:	9051M36G03	S/N: CAN39152			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter DA		5.8069			
Diameter DC		9.0231			
Diameter E		16.8113			
Nut, HPT Coupling					
P/N Found:	9654M80P08	S/N: AAM34602			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
overhaul					
LM2500 S1 HP NOZZLE, SINGLE					
Nozzle Assembly, HPT Stage 1					
P/N Found:	Illegible	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Nozzle, HPT Stage 1					
P/N Found:	CH-7455-3PT	S/N: 00020			
		S/N: 00026			
		S/N: 00035			
		S/N: 00037			
		S/N: 00058			
		S/N: 00084			
		S/N: 00130			
		S/N: 00131			
		S/N: 00134			
		S/N: 00135			
		S/N: 00157			
		S/N: 00175			
		S/N: 00186			
		S/N: 00190			
		S/N: 00192			
		S/N: 00195			

	S/N: 00259				
	S/N: 00310				
	S/N: 01153				
	S/N: 01191				
	S/N: 01271				
	S/N: 01303				
	S/N: Illegible				
Qty Serviceable: 0		Qty Repairable:	28	Qty Scrap:	3
Overhaul					
Nozzle, HPT Stage 1 Borescope					
P/N Found: CH-7455A-3PT	S/N: 00118				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Overhaul					
Seal, HPT Outer					
P/N Found: 9687M55G08					
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
BROKEN TABS, BURNT					
Seal, HPT Inner					
P/N Found: 9687M54G08					
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
BROKEN TABS, BURNT					
Support Assy, HPT Stage 1 Nozzle					
P/N Found: 9687M92G24	S/N: FABSL200				
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0
Dimension A		9.1911			
Dimension B		12.8274			
Diameter J		19.0889			
Diameter K		29.0758			
Baffle Assy, HPT Stage 1					
P/N Found: 9208M62G02					
Qty Serviceable: 16		Qty Repairable:	0	Qty Scrap:	2
Cracked and Missing Metal					
LM2500 S2 HP NOZZLE, SINGLE					
Nozzle Assembly, HPT Stage 2					
P/N Found: L25739G13	S/N: GEVEP460				
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0
Nozzle, HPT Stage 2					
P/N Found: CH-6950-15P	S/N: CNO0182				
	S/N: CNO1592				
	S/N: CNO1594				
	S/N: CNO1725				
	S/N: CNO1726				
	S/N: CNO1779				
	S/N: CNO1780				
	S/N: CNO1782				
	S/N: CNO1783				

	S/N: CNO1784		
	S/N: CNO1785		
	S/N: CNO1786		
	S/N: CNO1787		
	S/N: CNO1789		
	S/N: CNO1791		
	S/N: CNO1792		
	S/N: CNO1793		
	S/N: CNO1794		
	S/N: CNO1799		
	S/N: CNO1800		
	S/N: CNO1801		
	S/N: CNO1803		
	S/N: CNO1804		
	S/N: CNO1805		
	S/N: CNO1806		
	S/N: CNO1813		
	S/N: CNO1815		
	S/N: CNO1828		
	S/N: CNO1829		
	S/N: CNO1830		
	S/N: CNO1832		
Qty Serviceable: 0		Qty Repairable: 27	Qty Scrap: 5
Overhaul			
Nozzle, HPT Stage 2 Borescope			
P/N Found: CH-6950A-15P	S/N: CNO1788		
Qty Serviceable: 0		Qty Repairable: 1	Qty Scrap: 0
Overhaul			
Support, HPT Nozzle			
P/N Found: 9687M08G14	S/N: GEVEP460		
Qty Serviceable: 0		Qty Repairable: 1	Qty Scrap: 0
Flange Bent			
Shroud, HPT Stage 1 (Half-Size)			
P/N Found: 1347M95G03			
Qty Serviceable: 0		Qty Repairable: 48	Qty Scrap: 0
Overhaul			
Support, Shroud, HPT Stage 1 (Half Size)			
P/N Found: 1778M48P02			
Qty Serviceable: 36		Qty Repairable: 0	Qty Scrap: 12
Worn			
Seal Assy, Stationary Air			
P/N Found: 9311M28G05			
Qty Serviceable: 0		Qty Repairable: 11	Qty Scrap: 0
Overhaul			
Shroud Assy, HPT Stage 2			
P/N Found: 9082M58G05			
Qty Serviceable: 0		Qty Repairable: 9	Qty Scrap: 2
Overhaul			

Support Assy, Stage 2 Aft Shroud
P/N Found: 9082M63G03
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 1
SUPPORT WORN, BENT AND BULGING

Support, Shroud
P/N Found: 9082M82P02
Qty Serviceable: 22 Qty Repairable: 0 Qty Scrap: 0

Seal, HPT Stage 2
P/N Found: 9234M87P01
Qty Serviceable: 3 Qty Repairable: 0 Qty Scrap: 19
Cracked (NDT rejected)

Stop, HPT Shroud
P/N Found: 9082M85P01
Qty Serviceable: 11 Qty Repairable: 0 Qty Scrap: 0

Strip
P/N Found: 9174M20P01
Qty Serviceable: 19 Qty Repairable: 0 Qty Scrap: 3
Worn

Washer, Flat
P/N Found: 9174M19P01
Qty Serviceable: 22 Qty Repairable: 0 Qty Scrap: 0

LM2500 TURBINE REAR FRAME

Frame Assembly, Turbine Rear
P/N Found: L16727G27 S/N: FIA05133
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Send for inspection and Strut Fairing Rivet.

Manifold, Air/Oil, D-Sump
P/N Found: L21677P02
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Threads Damaged

Seal, Balance Piston, Fwd Stat. Air
P/N Found: L16712G06 S/N: SPK60136
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Honeycomb seals worn, Crack to be repaired
Aft Rabbet Outer Diameter 24.5000

Seal Assembly, Stationary Air
P/N Found: L16710G06 S/N: NOT SERIALIZED
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Honeycomb worn beyond limits

Seal Assembly, Fwd Stationary Air					
P/N Found:	L14421G04	S/N: EMD01398			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
SEAL SURFACE WORN BEYOND LIMITS					
Housing, Transducer					
P/N Found:	L24148P02				
Qty Serviceable:	2	Qty Repairable:	0	Qty Scrap:	0
Speed Transducer Retainers					
P/N Found:	L24168P02				
Qty Serviceable:	0	Qty Repairable:	2	Qty Scrap:	0
Fretting					
Speed Transducer Springs					
P/N Found:	L15500P01				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	1
Refer to individual comments.					
Seal, No. 7 Bearing Fwd Stationary Oil					
P/N Found:	L14423P06	S/N: HAAD8031			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair grooves in rubcoat					
Seal Surface B		10.0885			
Housing, No. 7 Bearing					
P/N Found:	L14405P02	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter DA		15.8254			
Diameter DF		13.3857			
Bearing, No. 7 Ball					
P/N Found:	L43720P01	S/N: FCAB3241			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Deflector, Aft					
P/N Found:	L16505P02				
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Insulation Blanket, Thermal, TRF					
P/N Found:	L31909P02				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Ripped					
Insulation, Blanket, Thermal, TRF					
P/N Found:	L31906P01				
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Ripped					

Insulation, Blanket, Thermal, TRF		
P/N Found: L31908P01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Ripped		
Insulation, Blanket, Thermal, TRF		
P/N Found: L31907P01		
Qty Serviceable: 0	Qty Repairable: 0	Qty Scrap: 1
Ripped		
Insulation, Thermal, TRF		
P/N Found: L31902P03		
Qty Serviceable: 3	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P02		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P01		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P05		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P07		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P06		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P04		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Insulation, Thermal, TRF		
P/N Found: L31902P08		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0
Retainer, Insulation		
P/N Found: L31903P01		
Qty Serviceable: 16	Qty Repairable: 0	Qty Scrap: 0
Strap Assy, Insulation Blanket		
P/N Found: L31905G01		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 0

Strap Assy, Insulation Blanket
P/N Found: L31905G02
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

LM2500 LPT FINAL ASSEMBLY

Spacer, No. 7 Bearing Locknut Ring
P/N Found: 9607M79P02
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Transducer
P/N Found: L21656P04 S/N: ILLEGIBLE
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0
P/N Found: L21656P04 S/N: ELRAD686
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Seal Assembly, Fwd. Rotating Air
P/N Found: L16595G03 S/N: HAAH5486
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Overhaul and repair guide pin.

Ring, Keyed Retaining
P/N Found: 9607M80P03
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 1
Bent

Nut, No. 7 Rear Bearing
P/N Found: 9607M78P01
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Overhaul

Bearing, No. 7 Roller
P/N Found: L11686P01 S/N: MDAP6314
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 1
Replaced on Overhaul

Plate, Lock, No. 7 Bearing
P/N Found: L16508P01
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Bearing, No. 7 Roller, Inner Race
P/N Found: L43719P01 S/N: FCAA8064
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 1
Replaced on Overhaul

Nut, Coupling
P/N Found: L21352P01 S/N: MLEG1766
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Overhaul

Adapter, Forward					
P/N Found:	L21333P04	S/N: FIA07311			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Spacer, No. 7 Bearing Locknut Ring					
P/N Found:	L14300P01				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Ring, Keyed Retaining					
P/N Found:	L16501P01				
Qty Serviceable:	0		Qty Repairable:	0	Qty Scrap: 1
Bent					
Nut, No. 7 Bearing Rotating Seal					
P/N Found:	L16500P02				
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Seal Assembly, Aft Stationary Air					
P/N Found:	L14409G03	S/N: EMD01356			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Seal, No. 7 Bearing Aft Stationary Oil					
P/N Found:	L14408G05	S/N: EMD01315			
Qty Serviceable:	0		Qty Repairable:	1	Qty Scrap: 0
Overhaul					
Ring, Spacer					
P/N Found:	L24238P01				
Qty Serviceable:	0		Qty Repairable:	0	Qty Scrap: 1
Damaged					
Seal, Aft Rotating					
P/N Found:	L14406P01	S/N: HAA09785			
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
Seal Serrations A			7.5890		
Seal Serrations B			7.5440		
Seal Inner Diameter			7.0056		
Ring, Speed Sensor					
P/N Found:	L21575P02				
Qty Serviceable:	0		Qty Repairable:	0	Qty Scrap: 1
Gear teeth worn					
Nozzle Assembly, Lube					
P/N Found:	L24113G02				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0
#6 Brg Keyed Retaining Ring					
P/N Found:	9607M36P02				
Qty Serviceable:	1		Qty Repairable:	0	Qty Scrap: 0

LM2500 LPT ROTOR					
Rotor Assembly, LPT					
P/N Found:	L16733G21	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Disk, Stage 1, LPT					
P/N Found:	L21172P02	S/N: XAE05141			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Damage in Web Area					
Diameter E		36.4100			
Diameter W		28.5515			
Diameter AB		37.7737			
Diameter W (as stamped)		28.5520			
Diameter AB (as stamped)		37.7790			
Disk, Stage 2, LPT					
P/N Found:	L21173P03	S/N: RPMCT876			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Diameter W		35.6140			
Diameter AB		28.9453			
Diameter W (as stamped)		35.6020			
Diameter AB (as stamped)		28.9389			
Disk, Stage 3, LPT					
P/N Found:	L21174P02	S/N: XAEO7135			
Qty Serviceable:	0	Qty Repairable:	0	Qty Scrap:	1
Repair underside of surface SA where indicated. Requires Hardness Testing					
Diameter W		25.2440			
Diameter AB		33.6273			
Diameter W (as stamped)		25.2440			
Diameter AB (as stamped)		33.6270			
Disk, Stage 4, LPT					
P/N Found:	L21175P03	S/N: XAE09040			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Requires Hardness Testing					
Diameter W		23.5141			
Diameter AB		31.3520			
Diameter W (as stamped)		23.5160			
Diameter AB (as stamped)		31.3510			
Disk, Stage 5, LPT					
P/N Found:	L21176P03	S/N: XAE11031			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Requires Hardness testing					
Diameter W		21.3457			
Diameter AB		28.7055			
Diameter W (as stamped)		21.3460			
Diameter AB (as stamped)		28.7090			

Disk, Stage 6, LPT					
P/N Found:	L21177P03	S/N: XAE13026			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Requires Hardness Testing					
Diameter W		17.8006			
Diameter AB		25.5621			
Diameter W (as stamped)		17.8040			
Diameter AB (as stamped)		25.5660			
Blade, LPT Stage 1					
P/N Found:	L21491P02				
Qty Serviceable:	0	Qty Repairable:	127	Qty Scrap:	39
Overhaul					
Blade, LPT Stage 2					
P/N Found:	L21492P02				
Qty Serviceable:	0	Qty Repairable:	141	Qty Scrap:	1
Overhaul					
Blade, LPT Stage 3					
P/N Found:	L21493P02				
Qty Serviceable:	0	Qty Repairable:	126	Qty Scrap:	0
Overhaul					
Blade, LPT Stage 4					
P/N Found:	L47574P01				
Qty Serviceable:	0	Qty Repairable:	112	Qty Scrap:	0
Overhaul					
Blade, LPT Stage 5					
P/N Found:	L47575P01				
Qty Serviceable:	0	Qty Repairable:	90	Qty Scrap:	0
Overhaul					
Blade, LPT Stage 6					
P/N Found:	9102M36P07				
Qty Serviceable:	0	Qty Repairable:	72	Qty Scrap:	0
Overhaul					
Seal, LPTR Stage 2					
P/N Found:	9688M15P05	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Outer Diameter		35.5808			
Seal, LPTR Stage 3					
P/N Found:	9688M16P01	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Outer Diameter		33.7146			

Seal, LPTR Stage 4					
P/N Found:	9395M66P01	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Outer Diameter		31.1444			
Seal, LPTR Stage 5					
P/N Found:	9395M67P01	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Outer Diameter		28.4403			
Seal, LPTR Stage 6					
P/N Found:	9688M19P02	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Outer Diameter		25.3707			
Shaft, LPTR Front					
P/N Found:	L21497P05	S/N: RPMDE044			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Requires Hardness Testing					
Bearing Journal Diameter DB		5.9061			
Diameter A		10.8019			
Seal Assembly, Balance Rotating					
P/N Found:	9010M36G02	S/N: PUR05346			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Seal A worn and Diameter E is too small.					
Shield Assembly					
P/N Found:	9632M97G03	S/N: ILLEGIBLE			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Repair Rub Coat on Aft End of Shield					
Seal, Air, No. 6 Bearing					
P/N Found:	9602M48P04	S/N: XAE00454			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Seal Serration are worn beyond limits					
Seal Serrations		33.9790			
Seal, No. 6 Bearing Vent Rotating					
P/N Found:	L24293P01	S/N: ILLEGIBLE			
Qty Serviceable:	1	Qty Repairable:	0	Qty Scrap:	0
Seal Serration is the average of the three seals. The sum of the three seals is 35.2052.					
Seal Serration A		11.7363			
Diameter B		10.8915			
Shaft, LPTR Rear					
P/N Found:	L16652G05	S/N: FIA04932			
Qty Serviceable:	0	Qty Repairable:	1	Qty Scrap:	0
Requires Hardness Testing					
Diameter A		7.3377			
Diameter B		8.2668			
Diameter D		23.7150			
Diameter E		8.2618			

Diameter G		6.3216			
Diameter H		10.2018			
Diameter J		9.4214			
Diameter L		7.0080			
Diameter M		7.0028			
Seal, Balance Piston Rotating					
P/N Found: L16742P02	S/N: PURU0057				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Overhaul					
Seal Serration A		24.9853			
Seal Serration B		24.7829			
Seal Serration C		24.5870			
Seal Serration D		24.3858			
Seal Serration E		24.1824			
Rabbet Diameter H		14.0001			
Rabbet Diameter F		20.4136			
Support, Balance Rotating Piston Seal					
P/N Found: L14475P02	S/N: PURU0045				
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
To be sent with Balance Piston Rotating Seal S/N PURU0057					
Rabbet Diameter G		20.4168			
Nut, No. 6 Bearing, Plain					
P/N Found: 9607M35P02					
Qty Serviceable: 0		Qty Repairable:	1	Qty Scrap:	0
Overhaul					
Bearing, No. 6 Roller, Inner Race					
P/N Found: 9146M72P03	S/N: MDAHP150				
Qty Serviceable: 0		Qty Repairable:	0	Qty Scrap:	1
Replaced on Overhaul					
Seal, No. 6 Bearing, Rotating Oil					
P/N Found: 9658M82P01	S/N: APV89927				
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0
Diameter B		6.6800			
Inner Diameter A		5.9056			
Baffle Assembly, Air					
P/N Found: L16616G01					
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0
Plug, LPTR Forward					
P/N Found: L21925P02					
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0
Retainer, Plug					
P/N Found: L16585P01					
Qty Serviceable: 1		Qty Repairable:	0	Qty Scrap:	0

LM2500 LPT STATOR

Stator Assembly, LPT
P/N Found: L21754G08 S/N: EPE02181
Qty Serviceable: 1 Qty Repairable: 0 Qty Scrap: 0

Case, LPT Stator
P/N Found: 1815M18G01 S/N: ILLEGIBLE
Qty Serviceable: 0 Qty Repairable: 1 Qty Scrap: 0
Overhaul

Insulator, Stage 1 Nozzle
P/N Found: L21496P01
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 2
Consumable

Insulator, Stage 1 Shroud
P/N Found: 9632M38P01
Qty Serviceable: 0 Qty Repairable: 0 Qty Scrap: 2
Consumable

Shroud Assembly, Stage 1
P/N Found: 9663M23G10
Qty Serviceable: 0 Qty Repairable: 14 Qty Scrap: 0
Overhaul

Nozzle, LPT Stage 2
P/N Found: L21752G01
Qty Serviceable: 0 Qty Repairable: 7 Qty Scrap: 3
Overhaul

Nozzle, LPT Stage 2
P/N Found: L21752G02
Qty Serviceable: 0 Qty Repairable: 2 Qty Scrap: 0
Overhaul

Nozzle, LPT Stage 2
P/N Found: L21752G03
Qty Serviceable: 0 Qty Repairable: 2 Qty Scrap: 0
Overhaul

Seal Assembly, Stage 2 Air
P/N Found: 9102M46G04
Qty Serviceable: 0 Qty Repairable: 2 Qty Scrap: 0
Overhaul

Seal Assembly, Stage 2 Air
P/N Found: 9102M46G05
Qty Serviceable: 0 Qty Repairable: 2 Qty Scrap: 0
Overhaul

Seal Assembly, Stage 2 Air		
P/N Found: 9102M46G06		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Shroud Assembly, Stage 2		
P/N Found: 9663M24G19		
Qty Serviceable: 0	Qty Repairable: 14	Qty Scrap: 0
Overhaul		
Nozzle, LPTS Stage 3		
P/N Found: L21753P01		
Qty Serviceable: 0	Qty Repairable: 12	Qty Scrap: 0
Overhaul		
Nozzle, LPTS S3, 3:00 UC & 9:00 LC		
P/N Found: L21753P02		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Nozzle, LPTS S3, 3:00 LC & 9:00 UC		
P/N Found: L21753G01		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Seal Assy, Stage 3 Air		
P/N Found: 9102M47G04		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Seal Assy, Stage 3 Air		
P/N Found: 9102M47G05		
Qty Serviceable: 0	Qty Repairable: 4	Qty Scrap: 0
Overhaul		
Seal Assy, Stage 3 Air		
P/N Found: 9102M47G06		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Shroud Assembly, Stage 3		
P/N Found: 9663M24G22		
Qty Serviceable: 0	Qty Repairable: 16	Qty Scrap: 0
Overhaul		
Nozzle, LPTS Stage 4		
P/N Found: 9663M04P04		
Qty Serviceable: 39	Qty Repairable: 15	Qty Scrap: 0
Repair cracks/ Remove build up		

Seal Assembly, Stage 4 Air		
P/N Found: 9102M48G03		
Qty Serviceable: 0	Qty Repairable: 6	Qty Scrap: 0
Overhaul		
Seal Assembly, Stage 4 Air		
P/N Found: 9102M48G04		
Qty Serviceable: 0	Qty Repairable: 2	Qty Scrap: 0
Overhaul		
Shroud Assembly, Stage 4		
P/N Found: 9663M69G18		
Qty Serviceable: 0	Qty Repairable: 18	Qty Scrap: 0
Overhaul		
Nozzle, LPTS Stage 5		
P/N Found: 9663M05P05		
Qty Serviceable: 42	Qty Repairable: 6	Qty Scrap: 0
5 Rejected by NDT and 1 Elongated hole		
Seal Assembly, Stage 5 Air		
P/N Found: 1473M49G02		
Qty Serviceable: 0	Qty Repairable: 8	Qty Scrap: 0
Overhaul		
Shroud Assembly, Stage 5		
P/N Found: 9663M69G20		
Qty Serviceable: 0	Qty Repairable: 16	Qty Scrap: 0
Overhaul		
Nozzle, LPTS Stage 6		
P/N Found: 9663M06P04		
Qty Serviceable: 46	Qty Repairable: 2	Qty Scrap: 0
Rejected NDT		
Seal Assembly, Stage 6 Air (8-per)		
P/N Found: 9102M49G04		
Qty Serviceable: 0	Qty Repairable: 8	Qty Scrap: 0
Overhaul		
Shroud Assembly, Stage 6		
P/N Found: 9663M70G11		
Qty Serviceable: 0	Qty Repairable: 16	Qty Scrap: 0
Overhaul		
Mount Assembly, Rear, Ground Handling		
P/N Found: L47492G05		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0

Cover Segment, Stg 1 Nozzle Insulator		
P/N Found: 9663M72G04		
Qty Serviceable: 12	Qty Repairable: 0	Qty Scrap: 0
Cover Segment, Stg 1 Nozzle Insulator		
P/N Found: 9688M20P01		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0
Cover Segment, Stg 1 Nozzle Insulator		
P/N Found: 9688M20P02		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 1
Cracked		
Spacer, Stage 2 Seal		
P/N Found: L21760P01		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0
Spacer, Stage 2 Seal		
P/N Found: L21760P02		
Qty Serviceable: 1	Qty Repairable: 0	Qty Scrap: 1
Broken		
Spacer, Stage 2 Seal		
P/N Found: L21760P03		
Qty Serviceable: 2	Qty Repairable: 0	Qty Scrap: 0

APPENDIX B: ON-OFF LOG

TRANSCANADA TURBINES

LM2500
GAS GENERATOR

Engine Serial#: 481-669
Customer: Maui Electric Co

PART & SERIAL NUMBER
OFF & ON LOG

DESCRIPTION	OFF		ON	
	PART NO.	SERIAL NO.	PART NO.	SERIAL NO.
CFF	L21370G20	FIA1534	L21370G20	FIA1534
IGB	L21082G11	EPE80070	L21082G11	EPE80070
AGB	L21441G26	EPE80065	L21441G26	EPE80065
HPCR	L21788G17	RPMCL312	L21788G17	RPMCL312
HPCS FWD.	L24067G18	CDPL6235	L24067G18	CDPL6235
HPCS AFT.	9686M83G18	CDPT6720	9686M83G18	CDPT6720
COMBUSTOR	9101M29G73	ALF00100	9101M29G73	ALF00100
CRF	9103M30G30	GEVAM445	9103M30G30	GEVAM445
HPTN 1	L25736G11	FABSL200	L25736G11	FABSL200
HPTR	L31397G	APV69477	L31397G	APV69477
HPTN 2	L25739G	GEVEB460	L25739G	GEVEB460
TMF	L24288G11	EPRA506	L24288G11	EPRA506
LPTS	L21754G08	EPE02181	L21754G08	EPE02181
LPTR	L16733G21	FIA04932	L16733G21	FIA04932
TRF	L16727G27	FIA05133	L16727G27	FIA05133
VGCONTROLLER		NOT RECEIVED		NOT RECEIVED
L/S PUMP 6 ELEM.	L24407P02	LJA32609	L24407P02	LJA32609

TRANSCANADA TURBINES		LM2500 HIGH PRESSURE TURBINE NOZZLE STAGE 1 (HPTN1) ASSEMBLY	
W/O #:	06-2LM-060	Engine Serial#:	481-669
Date:	15 JAN 07	Customer:	MAUI ELECTRIC
Module P/N:		Module Serial#:	

HPT NOZZLE STAGE 1
SERIAL NUMBERS, AT ASSEMBLY

Nozzle P/N: CH-7455-3PT

Borescope Nozzle P/N: CH-7455A - 3PT

	S/N		S/N		S/N
1	C 25163	12	00192	23	00084
2	00035	13	C25158	24	00058
3	C25161	14	C25159	25	00193
4	00131	15	00186	26	00259
5	00190	16	C25162	27	00037
6	00049	17	00020	28	C25157
7	01191	18	01271	29	C25160
8	C25156	19	00134	30	CN25784
9	00130	20	00047	31	CN25782
10	00135	21	CN25783	*32	00118
11	00157	22	00026		

*** Borescope Nozzle**

Performed by: _____

TRANSCANADA TURBINES		LM2500 HIGH PRESSURE TURBINE NOZZLE STAGE 2 (HPTN2) ASSEMBLY	
W/O #:	06-2LM-060	Engine Serial#:	481-669
Date:	15 JAN 07	Customer:	MAUI ELECTRIC
Module P/N:		Module Serial#:	

HPT NOZZLE STAGE 2

SERIAL NUMBER LIST AT ASSEMBLY & AS SHIPPED

Nozzle P/N: CH-16950-16PT | Boroscope Nozzle P/N: CH-16950A-16PT

	S/N		S/N		S/N
1	CN01830	12	CN01814	23	CN01806
2	CN41380	13	CN01779	24	CN01592
3	CN01815	14	CN01782	25	CN01812
4	CN01792	15	CN01793	26	CN40704
5	CN01787	16	CN01799	27	CN40656
6	CN01789	17	CN01805	28	CN41384
7	CN01594	18	CN41356	29	CN41378
8	CN01828	19	CN01832	30	CN40705
9	CN41386	20	CN01800	31	CN40703
10	CN01803	21	CN01791	32	CN40497
11	CN01794	22	CN01780	*33	CN01788

* Boroscope Nozzle

Date:	Technician:

TRANSCANADA TURBINES

LM2500
HIGH PRESSURE TURBINE ROTOR (HPTR) ASSEMBLY

W/O #:	06-2LM-060	**Engine Serial#:**	481-669
Date:	15 JAN 07	**Customer:**	MAUI ELECTRIC
Module P/N:		**Module Serial#:**	

HIGH PRESSURE TURBINE ROTOR
STAGE 1 BLADE SERIAL NUMBERS – AS INSTALLED

BLADE P/N: CH-6783-15P

	Serial Number		Serial Number		Serial Number
1	CN 35797	31	CN 35934	61	CN 35936
2	CN 35829	32	CN 35940	62	CN 35657
3	CN 35800	33	CN 35943	63	CN 35924
4	CN 35795	34	CN 35941	64	CN 35661
5	CN 35536	35	CN 35949	65	CN 35452
6	CN 36534	36	CN 35947	66	CN 35658
7	CN 35802	37	CN 35801	67	CN 35930
8	CN 35538	38	CN 35942	68	CN 35935
9	CN 35826	39	CN 35803	69	CN 35928
10	CN 35824	40	CN 35744	70	CN 35665
11	CN 35832	41	CN 35547	71	CN 35659
12	CN 35533	42	CN 35548	72	CN 35920
13	CN 35531	43	CN 35545	73	CN 35925
14	CN 35532	44	CN 35539	74	CN 35660
15	CN 35535	45	CN 35540	75	CN 35929
16	CN 35831	46	CN 35948	76	CN 35446
17	CN 35194	47	CN 35945	77	CN 35444
18	CN 34908	48	CN 35946	78	CN 35921
19	CN 35833	49	CN 35794	79	CN 35451
20	CN 35825	50	CN 35542	80	CN 35926
21	CN 35828	51	CN 35447	81	CN 35798
22	CN 35829	52	CN 35637	82	CN 35796
23	CN 35827	53	CN 35450	83	CN 35799
24	CN 35938	54	CN 35645	84	CN 35530
25	CN 35932	55	CN 35445	85	CN 35931
26	CN 35939	56	CN 35440	86	CN 35923
27	CN 35664	57	CN 35544	87	CN 35937
28	CN 35663	58	CN 35448	88	CN 35662
29	CN 35933	59	CN 35541		
30	CN 35830	60	CN 35543		

TRANSCANADA TURBINES		LM2500 HIGH PRESSURE TURBINE ROTOR (HPTR) ASSEMBLY	
W/O #:	06-2LM-060	Engine Serial#:	481-669
Date:	15 JAN 07	Customer:	MAUI ELECTRIC
Module P/N:		Module Serial#:	

HIGH PRESSURE TURBINE ROTOR
STAGE 2 BLADE SERIAL NUMBERS – AS INSTALLED

BLADE P/N: CH-6784-15P

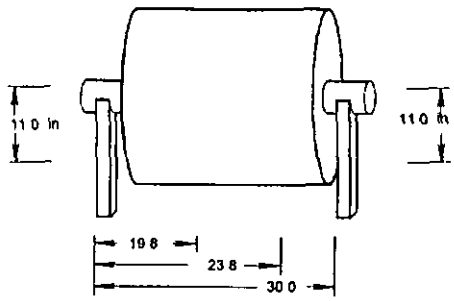
	Serial Number		Serial Number		Serial Number
1	CN 35588	31	CN 30109	61	CN 31062
2	CN 32438	32	CN 31546	62	CN 30625
3	CN 32437	33	CN 30108	63	CN 30624
4	CN 35592	34	CN 31545	64	CN 31061
5	CN 35591	35	CN 30107	65	CN 31060
6	CN 35583	36	CN 30110	66	CN 30620
7	CN 35584	37	CN 31550	67	CN 30621
8	CN 35585	38	CN 31549	68	CN 30622
9	CN 35586	39	CN 31548	69	CN 30623
10	CN 35587	40	CN 31547	70	CN 31059
11	CN 35599	41	CN 31129	71	CN 35590
12	CN 35598	42	CN 31130	72	CN 35589
13	CN 35597	43	CN 30578	73	CN 30619
14	CN 35596	44	CN 30577	74	CN 31058
15	CN 35595	45	CN 31134	75	CN 30618
16	CN 35600	46	CN 30579	76	CN 31551
17	CN 32956	47	CN 30580	77	CN 31552
18	CN 32957	48	CN 31131	78	CN 31055
19	CN 32958	49	CN 31132	79	CN 31056
20	CN 32959	50	CN 31133	80	CN 31057
21	CN 35593	51	CN 30243	81	CN 30581
22	CN 35594	52	CN 30244	82	CN 30582
23	CN 32955	53	CN 30245	83	CN 30583
24	CN 32954	54	CN 30246	84	CN 30584
25	CN 32953	55	CN 30247	85	CN 32444
26	CN 32952	56	CN 31128	86	CN 32443
27	CN 30112	57	CN 31127	87	CN 32442
28	CN 30111	58	CN 30249	88	CN 32441
29	CN 30105	59	CN 30248	89	CN 32440
30	CN 30106	60	CN 30242	90	CN 32439

Maui Electric

Balancer Report

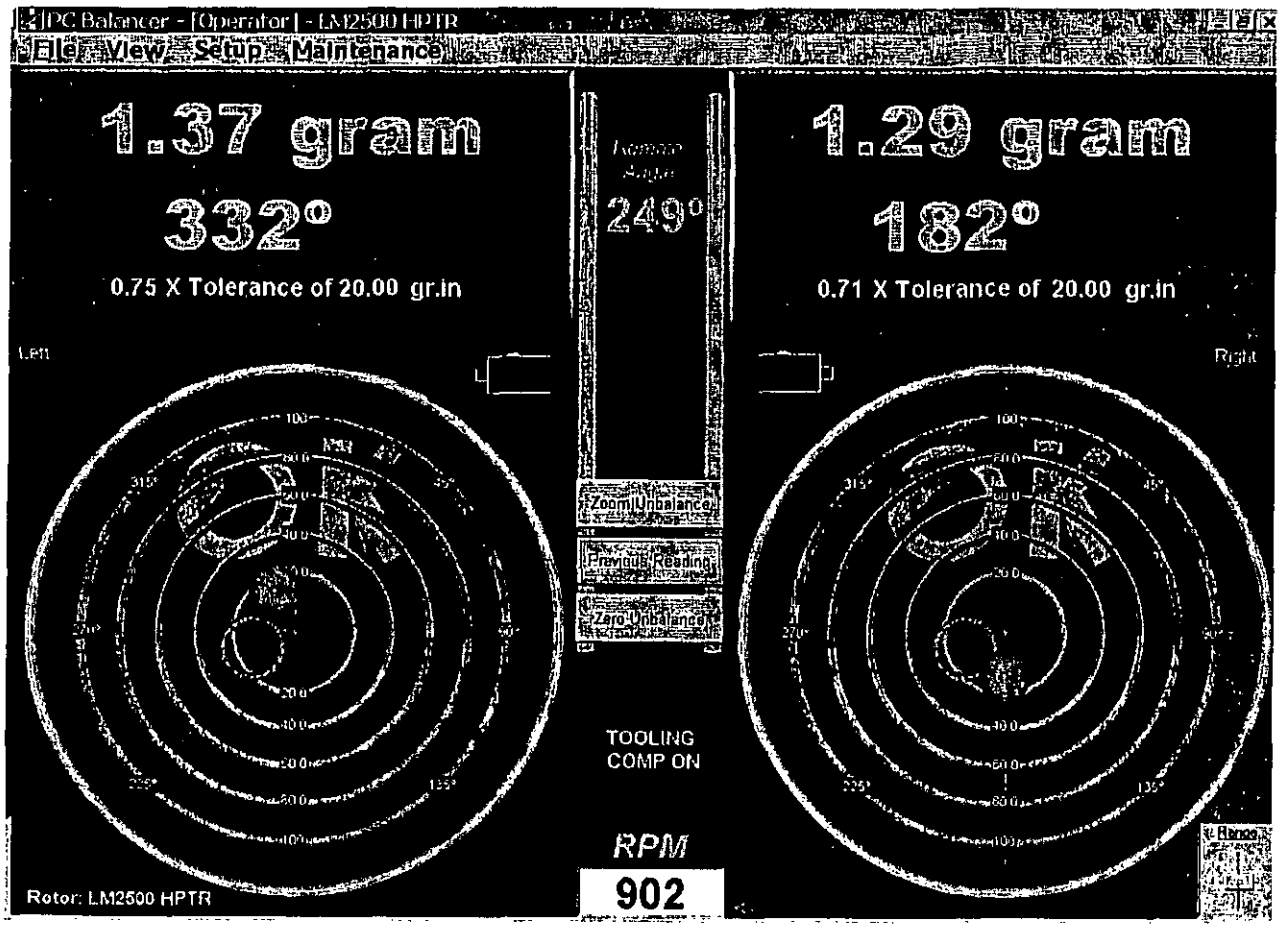
Phil

LM2500 HPTR ASSY.



Left Tolerance	20.00	gr.in
Right Tolerance	20.00	gr.in

			LEFT (static)			RIGHT (couple)					
	Rotor Name	Serial #	Amount	Angle	X Tol	Amount	Angle	X Tol	RPM	OK	Time
Final	LM2500 HPTR	481-669	1 37 gram	332	0.75	1 29 gram	182	0 71	902	YES	8:35 AM


PC Balancer - [Operator] - LM2500 HPTR
File View Setup Maintenance
1.37 gram
332°
0.75 X Tolerance of 20.00 gr.in
249°
1.29 gram
182°
0.71 X Tolerance of 20.00 gr.in
Right
Zoom/Unbalance
Previous Reading
Zero Unbalance
TOOLING
COMP ON
RPM
902
Rotor: LM2500 HPTR

TRANSCANADA TURBINES
We know your business.

APPENDIX C: SCRAP AND VENDOR REPORTS

CHROMALLOY FLORIDA
Incoming Evaluation Report

Date Quoted: February 21, 2007

Customer: TransCanada Turbines

C-FL Job #: 55737 R.O. #: 720110

Information Received on P.O.: P/N: 9206M96G05 S/N: CDPL6235

Description: LM2500 HPC Front Stator Case

Customer Repair Requested: Overhaul

Discrepancy: Overhaul. S/N: CDPL6235

Repairs needed:
IAW GEK99418, Chapter 8
Inspections: Visual, Dimensional, and FPI inspections

Repairs:

Para 6.7	$10,800.00
Para 6.9	$ 3,950.00
Para 6.10	$ 1,575.00

All scrap material will be disposed of on-site unless specifically requested for return by customer.

ESTIMATED TURNTIME: 25 days

Total Price to Repair: $ 16,325.00

Rhonda Blanke
Customer Service
1-850-244-7684
Fax: 850-664-9518

CHROMALLOY FLORIDA
630 Anchors Street, N.W.
Ft. Walton Beach, FL 32548

CHROMALLOY FLORIDA
Incoming Evaluation Report

Date Quoted: February 21, 2007

Customer: TransCanada Turbines

C-FL Job #: 55734 R.O. #: 720110

Information Received on P.O: P/N: 9103M30G30 S/N: GEVAM455

Description: LM2500 Compressor Rear Frame

Customer Repair Requested: Overhaul. Repair Midflange as required.

Discrepancy: Actual S/N: GEVAM445

Repairs:
IAW GEK99418, Section 10
Inspection: Visual, dimensional and fluorescent penetrant.
(Para D) Pressure test

Repairs - Paragraphs:
10-4.1, 10-5.2, 10-5.2.5, 10-5.2.9, 10-5.2.12, 10-5.2.12.A, 10-5.2.14, 10-5-2.15, 10-5.2.16, 10-5.2.17, 10-5.2.19, & 10-5.2.19.B; CFL 589-SR 03
CRF Outer Casing Mid-flange Repair

Compressor Rear Frame Repair:	$20,796.00
Sump Housing Repair:	$ 6,279.00
Materials (please see attached)	$ 5,523.00
Repair Price:	$32,598.00

Note: All scrap material will be disposed of on-site unless specifically requested for return by customer.
ESTIMATED TURNTIME: 30 to 40 days from quote approval

Total Price to Repair: $ 32,598.00

Rhonda Blanke
Customer Service
1-850-244-7684
Fax: 850-664-9518

CHROMALLOY FLORIDA
630 Anchors Street, N.W.
Ft. Walton Beach, FL 32548
Direct Toll Free: 800-633-7893

Tina Gibson
Customer Service – Combustor Shop
Tel: (850) 244-7684 ext. 309

CHROMALLOY FLORIDA
630 Anchors Street, N.W.
Ft. Walton Beach, FL 32548

CHROMALLOY FLORIDA
Evaluation Report

Date Quoted: February 22, 2007

Customer: TransCanada Turbines

C-FL Job #: 55731 **R.O. #:** 720110 – Line 002

Information Received on P.O.: **P/N:** 9101M29G73 **S/N:** ALF00100

Description: LM2500 Combustor Assy.

Discrepancy: None

Customer Repair Requested: Please evaluate for overhaul.

Repairs Needed to Make Serviceable:
IAW GEK 99418 (Revision 3), Section #10
Inspection: Visual, Dimensional, and FPI.
Cowl – P/N: 9655M41G06
Crack repair required; rivet holes cracked and oversized; dimensional restoration is required; dents on I/D & O/D of cowl.
Dome – P/N: 9016M57G08
Crack repair required; All 30 swirlers worn out of tolerance & have step in bore, require replacing; Igniter sleeves burnt & worn out of tolerance; Inner & outer rivet has excessive cracks; rivet holes cracked & oversized; TBC chipped & depleted; Dimples located on the Inner & Outer cracked.
Inner Liner– P/N: 9016M53G11
Crack repair required; Air seal worn out of tolerance, replacement required; TBC chipped & depleted; Rivet holes cracked & oversized; Dilution holes cracked on #1 louver; dimensions are out of tolerance.
Outer Liner –P/N: 9101M25G22
Crack repair required; dimensions are out tolerance; rivet holes worn out of tolerance; #8 panels burnt and have circumferential cracks/voids; TBC chipped and depleted.

Labor and Consumables	$17,995.00
Materials (Includes 10% Mark-up)	$13,861.00
Total Price to Repair:	**$31,856.00**

TAT: **30 days from quote approval**

APPROVAL: _____ **DATE:** _____

CHROMALLOY FLORIDA
Incoming Evaluation Report

Date Quoted: March 2, 2007

Customer: TransCanada Turbines

C-FL Job #: 55738

Information Received on P.O.: P/N: L24288G41 S/N: ICPFA506

Description: LM2500 Turbine Mid Frame R.O. #: 720110

Customer Repair Requested: Overhaul

Discrepancies: Actual S/N: FCPFA506

Repairs:
IAW GEK 99418 Chapter 15 – "P" Series
Visual, dimensional and FPI inspection.

Turbine Mid Frame Assembly **$ 9,950.00**
Paragraphs 15-1.2 and 15-4-1. GEK 9250, 70-41-00 General Weld repair.
CFL 582-SR03 – Addition of TBC to TMF Case (Ref: CF6-6 SB 72-970 / LM2500 IND-0175)
Disassembly, cleaning, decoke, incoming inspection, assembly, dimensional inspection, pressure test and final inspection.

Outer Case, hub & struts (Heavy Workscope) **$17,983.00**
GEK9250, 70-41-00. Paragraphs: 15-5.2, 15-5.4, 15-5.24, 15-5.39, and GEK9266 72-54-01 Repair 26
Full penetrant inspection, general welding & blending operations and dimensional restoration of outer casing, hub & struts, inclusive of thermal barrier coating

Outer liner support (Z-ring) **$ 7,500.00**
Paragraph: 15-5.18
Full penetrant inspection, general welding and blending operations and sizing

Sump **$ 4,706.00**
Paragraphs: 15-5.33, 15-5.35, and 15-5.37
Full penetrant inspection, general welding and blending operations, Plasma spray and dimensional restoration

LPT Nozzle Support **$ 3,957.00**
SB IND – 187 – Upgrade LPT Nozzle support Hardware
Full penetrant inspection, general welding and blending operations

TMF Liner (Heavy Workscope): **$59,000.00**
Paragraph 15-5.9 and 15-5.16
Liner beam replacement

Page 2 – PO# 720110
CFL Job# 55738

Base Price	$103,096.00
Materials (please see attached):	$ 34,889.00
Total	$137,985.00

All scrap material will be disposed of on-site unless specifically requested for return by customer.

ESTIMATED TURNTIME: 30 to 40 days

Total Price to Repair: $ 137,985.00

Rhonda Blanke
Customer Service
1-800-633 7893
Fax: 850-664-9518

CHROMALLOY FLORIDA
630 Anchors Street, N.W.
Ft. Walton Beach, FL 32548

TSS

Aviation, Inc.
11550 Mosteller Rd. ~ Cincinnati, OH 45241
(513) 772-7000 FAX (513) 771-0162
(TSS APM) FAA # T3LR667N EASA.4939

NSMR

NON-Serviceable Material Report

TSS SO No. TS43415-2A

Attention: Tonya & Tracey FAX:
Customer Name: TRANS CANADA TURBINE
P.O. No: 720281 Item - 2 W/O No: N/A

Their Customer Name:
Their Cust. P.O. No:

Part Number: L25734G04 S/N: LGH07956
Description: SHIELD ASSY, THERMAL,HPT Qty Rec.=1 Qty Rep.=0 Qty Rej.=1
Engine Model: LM2500 ATA: CHAPTER 14-9.1

Explanation:

The seal teeth diameters V2 thru V4 Check .004 to .012 under the maximum repairable limit.

Authorized Engineering/Quality Signature Date
Gary Lawson 3/29/2007

NSMR Report

GE Aircraft Engines

NON-SERVICEABLE MATERIAL REPORT

ACSC - CINCINNATI
AVIATION COMPONENT SERVICE CENTER
201 W. CRESCENTVILLE ROAD

CINCINNATI OH 45246-1708

AIRLINE / CUSTOMER	DATE	SHIP ID
TRANS CANADA TURBINE	29 March 2007	739812

Attention: TONYA MARTIN

NSM No: 121767

PURCHASE/REPAIR ORDER	P.O.ITEM	ORDER NUMBER	PART NAME	PART NO.	PART S/N	QTY
4000013	1	511456	LPT DISK-1	L21172P02	XAE05141	1

SHOP ORDER: 804013

DURING FPI INSPECTION PER THE LM2500 ENGINE MANUAL
THE AFT ID CONE BODY HAS A LINEAR INDICATION,
POSSIBLY CAUSED BY EROSION FOUND 360%. FPI REJECT
PER ESM, NO REPAIR AVAILABLE

COMMENTS:

SIGNATURE_____
T FLEMING

GE Proprietary Information - Subject to Restrictions on Login Screen

NSMR Report

GE Aircraft Engines

NON-SERVICEABLE MATERIAL REPORT

ACSC - CINCINNATI
AVIATION COMPONENT SERVICE CENTER
201 W. CRESCENTVILLE ROAD

CINCINNATI OH 45246-1708

AIRLINE / CUSTOMER	DATE	SHIP ID
TRANS CANADA TURBINE	28 March 2007	739564

Attention: TONYA MARTIN

NSM No: 121735

PURCHASE/REPAIR ORDER	P.O.ITEM	ORDER NUMBER	PART NAME	PART NO.	PART S/N	QTY
4000013	1	511456	STAGE 3 LP	L21174P02	XAE07135	1

SHOP ORDER: 804012

DURING INCOMING INSPECTION PER THE LM2500 ENGINE MANUAL\(TABLE 23-19\), THE ID OF THE AFT FLANGE HAS SEVERAL NICKS AND DENTS. WORST NICK MEASURED TO HAVE A DEPTH OF 0.50", MAX REPAIRABLE LIMIT IS 0.20". NICK CHECKS 0.30" OVERMAX PER GEK99418. NO REPAIR AVAILABLE

COMMENTS:

SIGNATURE_____
T FLEMING

GE Proprietary Information - Subject to Restrictions on Login Screen

Unison Industries LLC Dayton
Component Repair
2070 Heller Road
Alpha, OH 45301 USA
Phone: (937) 490-7023
Fax: (937) 490-7081

NON-SERVICEABLE MATERIAL REPORT

Airline/Customer: TransCanada Turbines **Date:** 3/27/07

Attention: Tonya Martin **NSMR/MO#:** R051317

Purchase/Repair Order Number	PO Item	Elano Order Number	Part Name	Part Number	Qty
4000070	6	6908002	Manifold, Fuel Secondary	L34693G02	1 EA.

QTY	DEFECTS DESCRIPTION
1	All 15 ball nose fittings appear to have been replaced and are not aligned correctly. These components are not procurable.

COMMENTS: COMMENTS: Does TCT want this unit scrapped locally or returned as received?

SIGNATURE: Sue Stoneburner 3/27/07

Unison Industries LLC Dayton
Component Repair
2070 Heller Road
Alpha, OH 45301 USA
Phone: (937) 490-7023
Fax: (937) 490-7081

NON-SERVICEABLE MATERIAL REPORT

Airline/Customer: TransCanada Turbines **Date:** 3/30/07

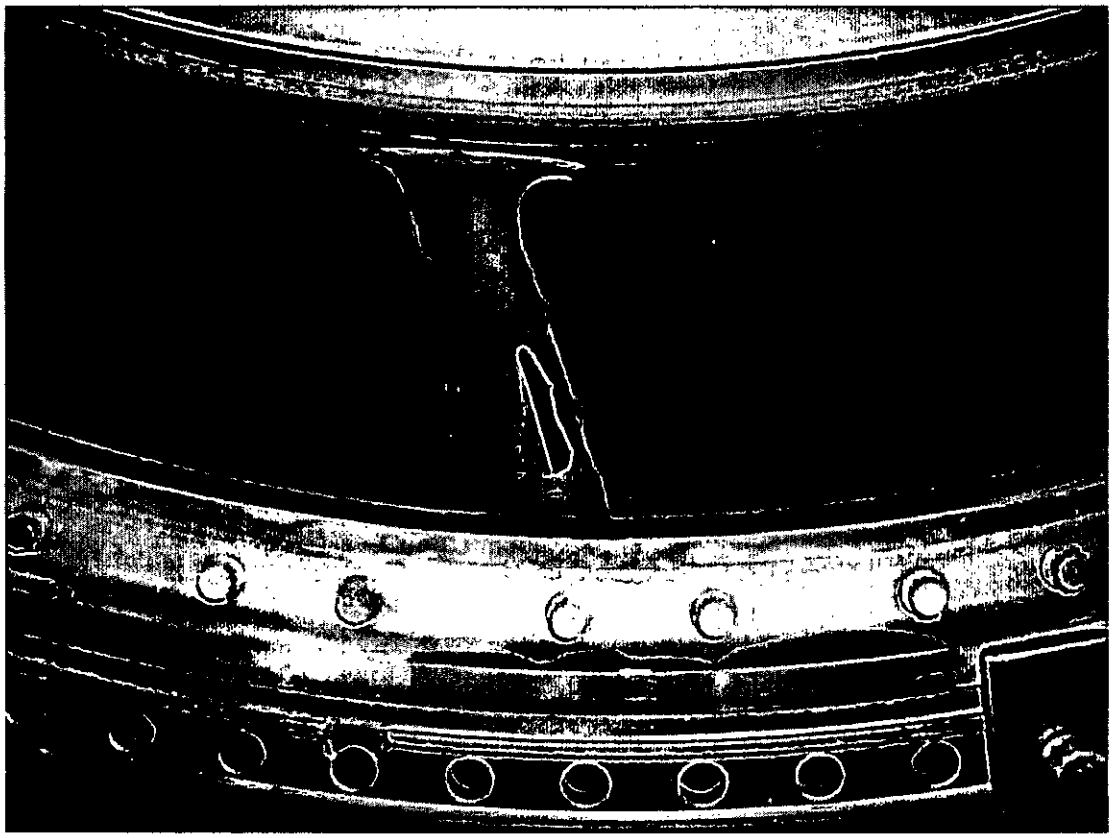
Attention: Tonya Martin **NSMR/MO#:** R051316

Purchase/Repair Order Number	PO Item	Elano Order Number	Part Name	Part Number	Qty
4000070	5	6908000	Manifold, Fuel Secondary	L34693G01	1 EA.

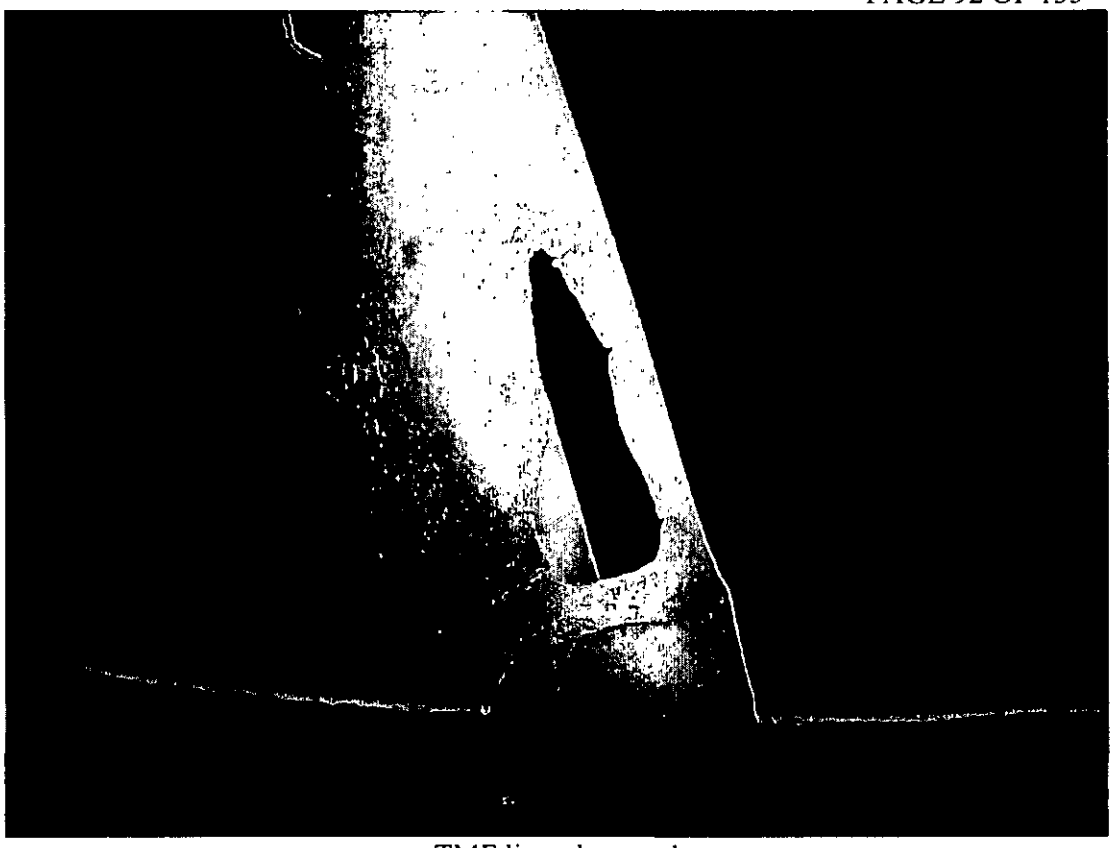
QTY	DEFECTS DESCRIPTION
1	One of the tee's is damaged beyond repair but is not procurable. No repairs are possible.

COMMENTS: COMMENTS: Does TCT want this unit scrapped locally or returned as received?

SIGNATURE: Sue Stoneburner 3/30/07

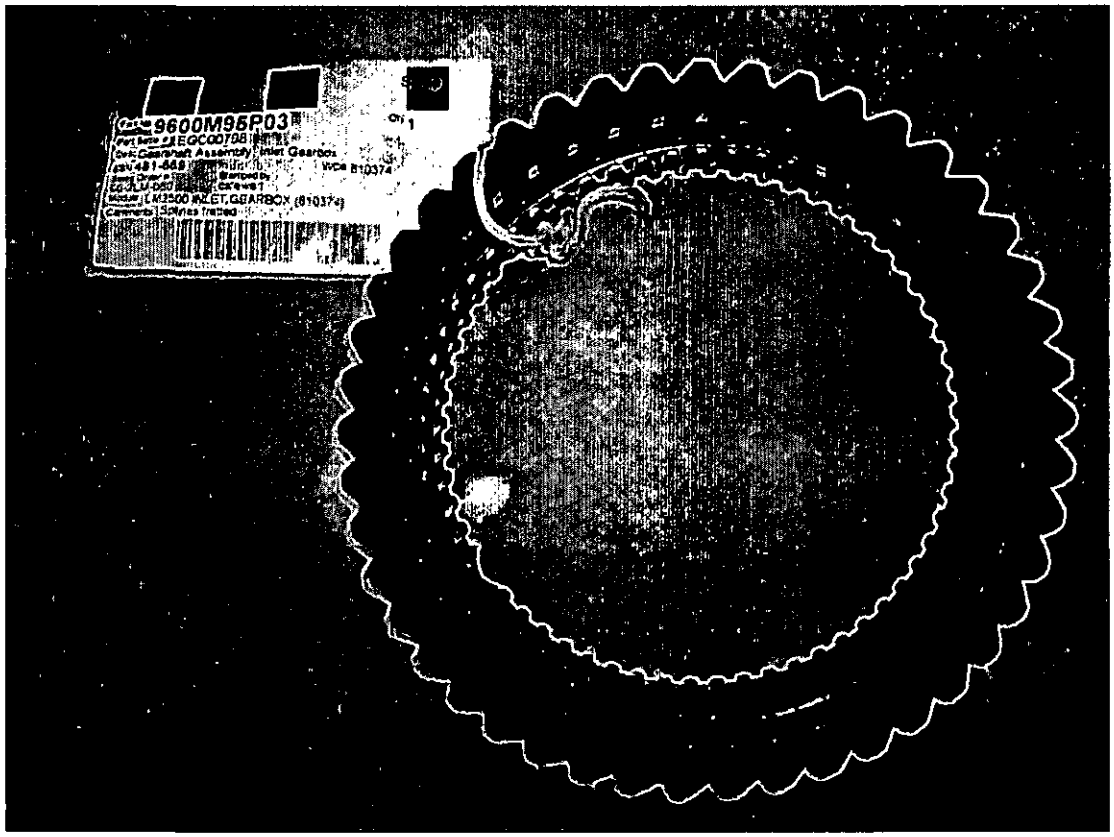


TMF liner damaged

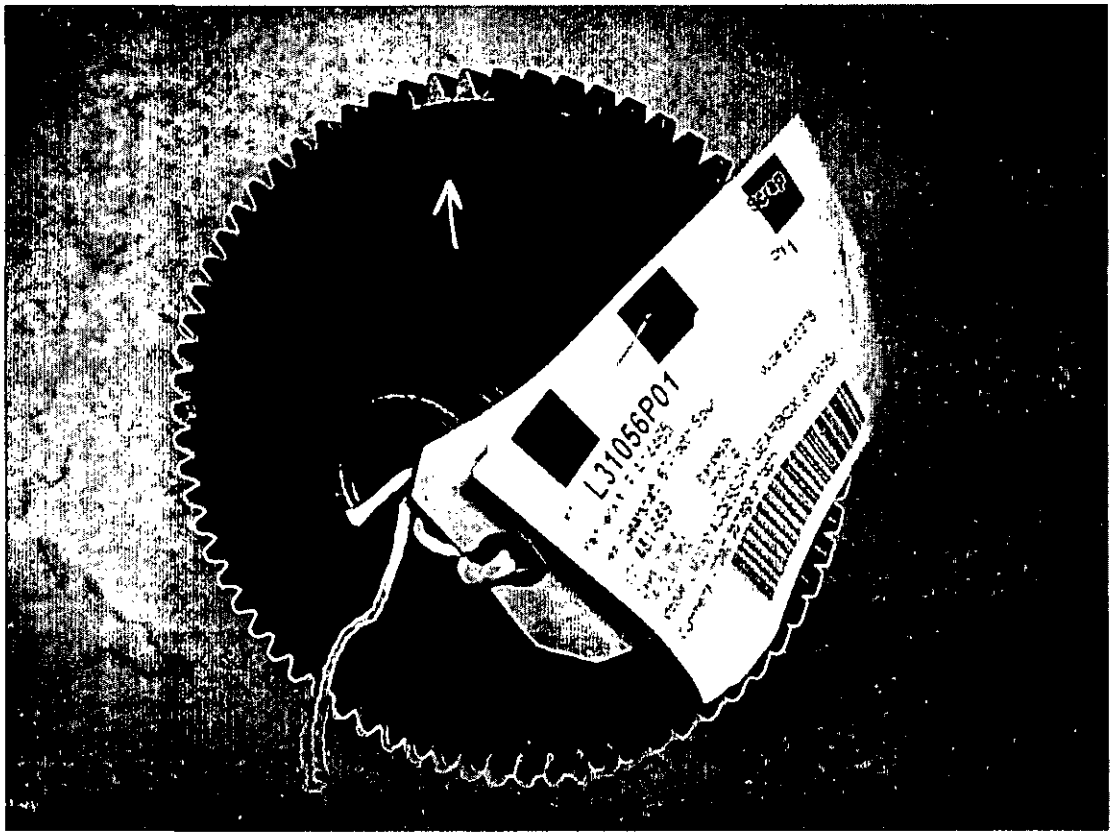


TMF liner damaged

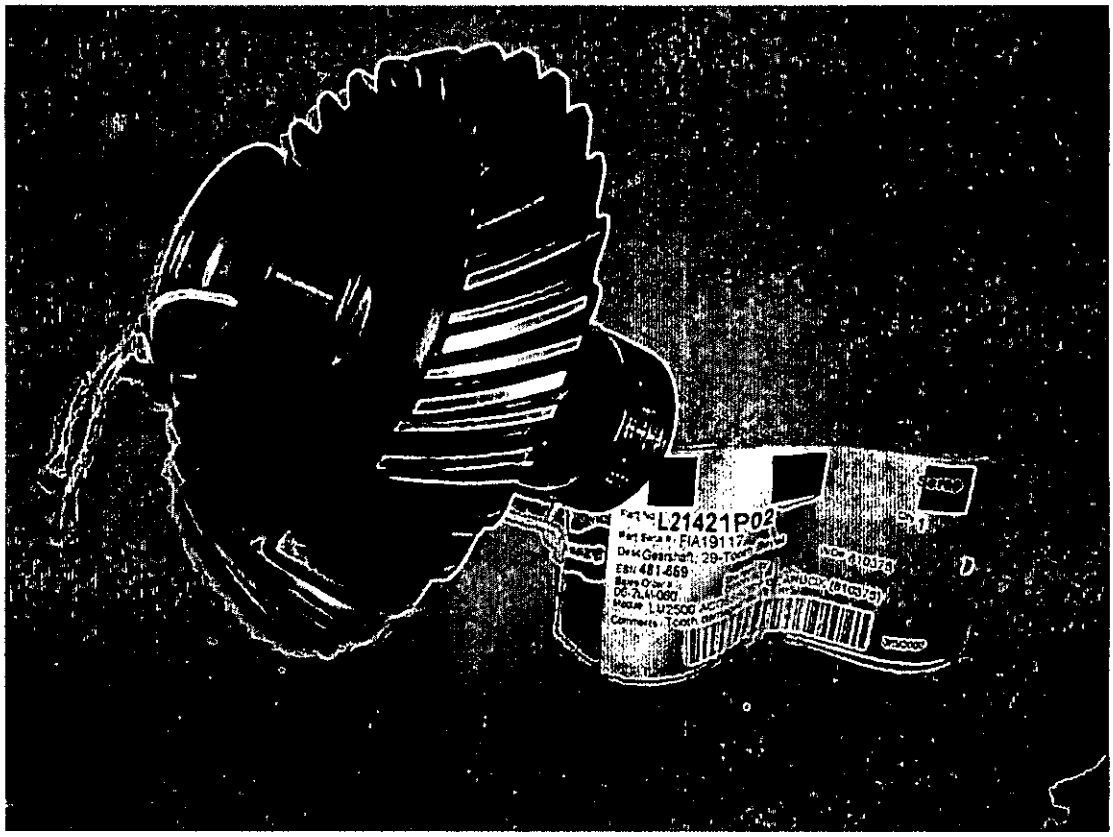
Fuel nozzle tips worn



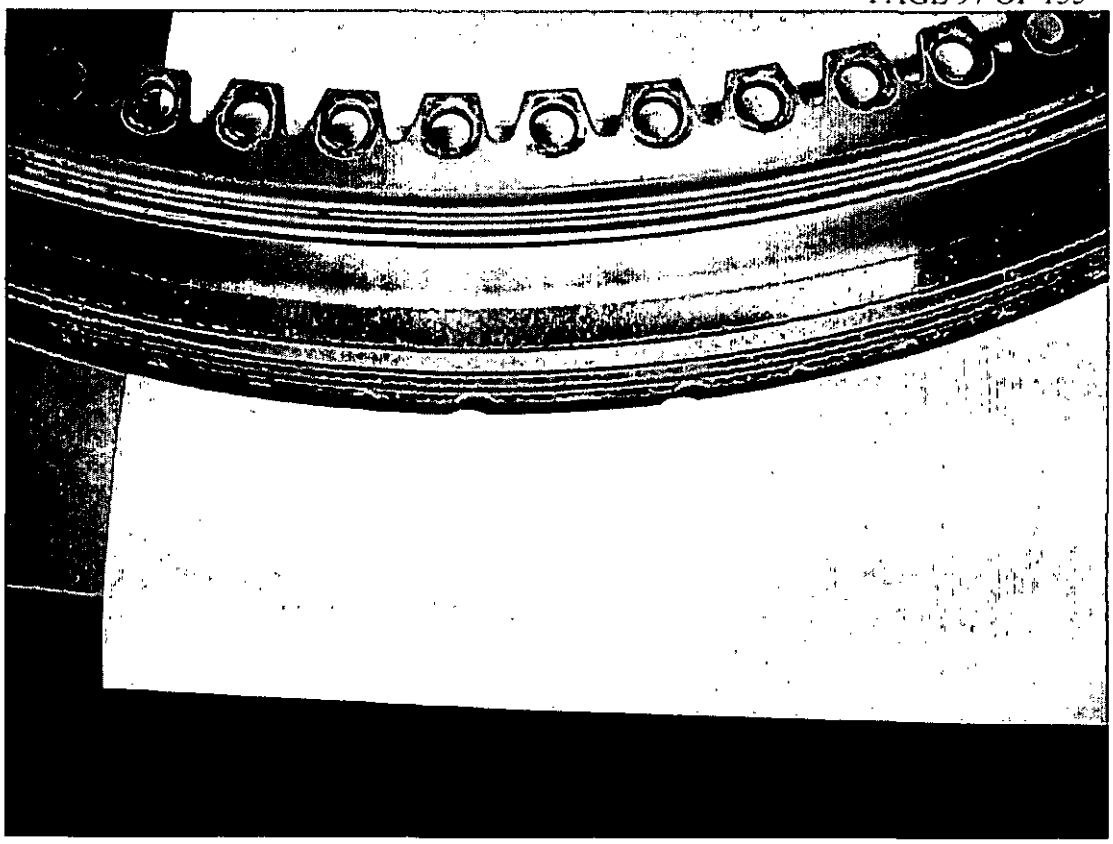
IGB Gearshaft had fretted splines



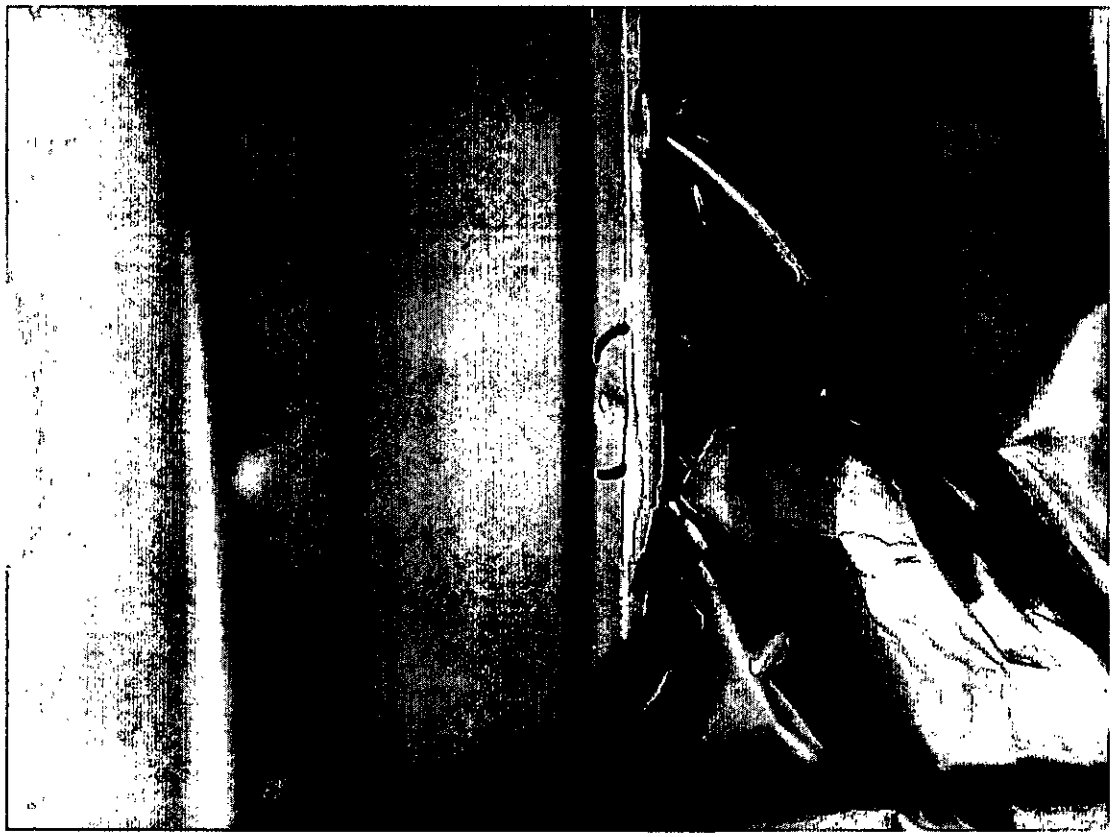
AGB had damaged tooth



AGB had damaged tooth



HPT Thermal shield had excessive damage on serrations



Stage1 LPT disk had damage beyond repairable limits

Stage3 LPT disk crack indications in non-repairable area

APPENDIX D: PARTS AS INSTALLED

CUSTOMER	**Maui Electric**	
MODEL	**LM2500 GT**	**14-May-07**
SERIAL NUMBER	**691-669**	**Prepared By**
TYPE	**GT OH**	**Ward Martin**

Parts as installed

CFF				
Replacement Part	Part	Description	Condition	Qty
	9607M05P08	PACKING	NEW	1
	9607M05P14	SEAL	NEW	1
	9643M56P02	GASKET	NEW	1
	J221P009	O-RING	NEW	1
	J221P017	PACKING	NEW	1
	J221P116	PACKING	NEW	1
	J643P05D	BOLT	NEW	17
	J644P04D	BOLT, MACHINE	NEW	11
	L31708P01	Bearing, No. 3 Roller	NEW	1
	L31818G01	Tube, Oil Damper	NEW	1
Repaired Part	Part	Description	Condition	Qty
	L31710G01	Housing, No. 3 Bearing	Repair	1
	L44765G01	Seal, Stationary (Inlet) Air	Repair	1
	L47033G02	Seal, Stat Oil, 3R Bearing	Repair	1
HPCR				
Replacement Part	Part	Description	Condition	Qty
	1854M45G02	RETAINER	NEW	36
	635E901P03	NUT	NEW	48
	9012M99G13	BOLT	NEW	48
	9032M78P05	SEAL	NEW	1
	9085M11P01	BOLT	NEW	1
	9085M12P01	BOLT	NEW	2
	9085M12P02	BOLT	NEW	21
	9108M65P01	INSERT	NEW	8
	9155M26G08	BOLT	NEW	18
	9173M88G01	LOCKING	NEW	2
	9173M88G10	LUG.ASSY	NEW	4
	9182M24P02	STOP RETAINER	NEW	26
	9182M25P01	Retainer, Stage 2 Blade	NEW	2
	9207M41G04	BOLT	NEW	48
	9211M83G08	LUG ASSEMBLY, LOCKING	NEW	4
	9211M83G09	LUG ASSMBLY, LOCKING	NEW	6
	9211M83G10	LUG ASSEMBLY, LOCKING	NEW	2
	9290M65P01	NUT	NEW	48
	9648M79P34	RETAINING RING ROTOR PART	NEW	1
	9661M12P17	RING	NEW	1
	9661M12P18	RING	NEW	1
	9661M70P03	SEAL RING	NEW	1
	9661M72P02	PACKING	NEW	2
	9661M72P07	PACKING	NEW	1

	9663M71P07	NUT	NEW	24
	9809M52P05	BOLT	NEW	20
	K157G02	Blade, HPCR Stage 1	Serviceable	36
	K350P28	Blade, HPCR Stage 3	NEW	3
	K451P25	Blade, HPCR Stage 4	NEW	2
	K552P25	Blade, HPCR Stage 5	NEW	2
	K669P20	Blade, HPCR Stage 6	NEW	5
	K775P16	Blade, HPCR Stage 7	NEW	3
	K841P20	Blade, HPCR Stage 8	NEW	3
	K107P23	Blade, HPCR Stage 9	NEW	3
	K043P28	Blade, HPCR Stage 10	NEW	6
	K144P20	Blade, HPCR Stage 11	NEW	2
	K245P20	Blade, HPCR Stage 12	NEW	1
	K427P04	Blade, HPCR Stage 14	NEW	2
	K547P38	Blade, HPCR Stage 15	NEW	35
	K648P34	Blade, HPCR Stage 16	NEW	9
	J199P02	NUT	NEW	18
	J221P258	PACKING	NEW	1
	JA1854M45G02	RETAINER	NEW	36
Repaired Part	Part	Description	Condition	Qty
	9021M62P04	Disk, HPCR Stage 1	Repair	1
	9021M63P12	Disk, HPCR Stage 2	Repair	1
	9021M64P12	Spool, HPCR Stages 3 - 9	Repair	1
	9021M66P03	Spool, HPCR Stages 11 - 13	Repair	1
	9021M67P12	Spool, HPCR Stages 14 - 16	Repair	1
	9645M92P04	Nut, Rotating Air Seal	Repair	1
	9686M60G33	Seal, Rot. Air, 4R Brg (CDP)	Repair	1
	L21786G03	Shaft Assy, HPCR Rear	Repair	1
	L21787G06	Duct Assy, Air	Repair	1
	K256P07	Blade, HPCR Stage 2	Repair	26
	K107PXX	BLADE, HPC S9	Repair	63
	K841PXX	BLADE, HPC S8	Repair	63
	K775PXX	BLADE, HPC S7	Repair	61
	K669PXX	BLADE, HPC S6	Repair	51
	K552PXX	BLADE, HPC S5	Repair	52
	K451PXX	BLADE, HPC S4	Repair	43
	K350PXX	BLADE, HPC S3	Repair	39
	K648PXX	BLADE, HPC S16	Repair	67
	K547PXX	BLADE, HPC S15	Repair	41
	K427PXX	BLADE, HPC S14	Repair	74
	K326PXX	BLADE, HPC S13	Repair	76
	K245PXX	BLADE, HPC S12	Repair	75
	K144PXX	BLADE, HPC S11	Repair	74
	K043PXX	BLADE, HPC S10	Repair	70
HPCS				
Replacement Part	Part	Description	Condition	Qty
	1327M98P04	BEARING, SLOT LOADED	NEW	18
	1333M65G01	Ring Segment, IGV Actuation	NEW	2
	1333M65G02	Ring Segment, S1 Actuation	NEW	2

	1333M65G03	Ring Segment, S2 Actuation	NEW	2
	1333M65G07	Ring Segment, S6 Actuation	NEW	1
	1333M67P01	BEARING, SLOT LD	NEW	2
	1333M68P01	BEARING, SLOT LD	NEW	2
	1333M69P01	BEARING, SLOT LD	NEW	2
	1336M28P01	BEARING, SLOT LD	NEW	14
	1340M24P02	Boot, Viton	NEW	3
	9073M97P14	Liner, Vane Dovetail, LH	NEW	1
	9079M49G01	Arm, Vane Act., S5	NEW	6
	9079M49G02	Arm, Vane Act., S6	NEW	7
	9115M70P02	Alignment Sleeves, VSV Stg 5&6	NEW	2
	9146M80P02	SLEEVE	NEW	292
	9206M59P09	SPACER, VANE, 0.082 - 0.083	NEW	2
	9206M59P11	SPACER, VANE, 0.084 - 0.085	NEW	1
	9206M59P12	SPACER, VANE, 0.085 - 0.086	NEW	2
	9206M61P07	SPACER, VANE, 0.080 - 0.081	NEW	8
	9206M79P16	WASHER	NEW	96
	9206M79P17	WASHER	NEW	122
	9207M68P14	BUSHING	NEW	96
	9207M68P15	BUSHING	NEW	122
	9211M10G01	Shroud Assy, IGV	Serviceable	1
	9211M13P05	BOLT	NEW	8
	9211M13P06	BOLT, SHEAR	NEW	12
	9211M39G02	BUSHING	NEW	76
	9379M41G05	Shroud Assy, Stage 1	NEW	2
	9633M14G20	Arm, Vane Act., IGV	NEW	7
	9633M14G20	Arm, Vane Act., IGV	Serviceable	14
	9633M14G21	Arm, Vane Act., S1	NEW	25
	9633M14G22	Arm, Vane Act., S2	NEW	8
	9633M14G23	Arm, Vane Act., S3	NEW	9
	9633M15G20	Arm, Vane Act., IGV Splitline	NEW	1
	9633M15G23	Arm, Vane Act., S3 Splitline	NEW	1
	9633M19G03	Arm, Vane Act., S4	NEW	8
	9643M88P03	LINK	NEW	1
	9644M72P04	NUT	NEW	312
	9646M51P05	Sleeve, Aligning	NEW	6
	9673M10P01	WASHER	NEW	110
	9673M11P01	BUSHING	NEW	110
	9693M68G04	Spacer, Actuation Ring	NEW	16
	J200P03	NUT	NEW	56
	K001P07	Vane, IGV	NEW	3
	K202P02	Vane, Stage 2	NEW	2
	K344P03	Vane, Stage 3	NEW	32
	K445P03	Vane, Stage 4	NEW	11
	K546P02	Vane, Stage 5	NEW	32
	K647P02	Vane, Stage 6	NEW	7
	K779P50	Vane, Stage 7	NEW	11
	K109G02	Vane, Stage 8	NEW	3
	K081P21	Vane, Stage 10	NEW	1
	K688P19	Vane, Stage 16	NEW	10
	KT9211M13P05	SCREW	NEW	20
	L21700P01	BRACKET	NEW	1

	L25755P01	BUSHING	NEW	34
	MS9321-10	WASHER, FL	NEW	1
	MS9373-021	GASKET	NEW	3
Repaired Part	Part	Description	Condition	Qty
	9206M96G05	Case, HPCS Front	Repair	1
	9686M81G09	Case, HPCS Rear	Repair	1
		Vane Grind	Repair	1
	Vane, IGV	K001PXX	Repair	31
	Vane S1	K172PXX	Repair	36
	Vane S2	K202PXX	Repair	38
	Vane S3	K344PXX	Repair	14
	Vane S4	K445PXX	Repair	39
	Vane S5	K546PXX	Repair	26
	Vane S6	K647PXX	Repair	57
	Vane S7	K779PXX	Repair	61
	Vane S8	K109PXX	Repair	31
	Vane S9	K980PXX	Repair	74
	Vane S10	K081PXX	Repair	79
	Vane S11	K182PXX	Repair	80
	Vane S12	K209PXX	Repair	80
	Vane S13	K310PXX	Repair	80
	Vane S14	K412PXX	Repair	88
	Vane S15	K513PXX	Repair	88
	Vane S16	K688P20	Repair	100
CRF				
Replacement Part	Part	Description	Condition	Qty
	133A1624P66	WASHER	NEW	20
	133A1624P7	WASHER	NEW	4
	1443M45P06	TIE DOWN STRAP	NEW	1
	9025M31G01	NUT	NEW	2
	9371M19P05	SEAL	NEW	1
	9602M39P02	NUT	NEW	2
	9607M05P40	PREF PACKING	NEW	2
	9627M75P03	GASKET, BRG #4	NEW	1
	9636M51P03	Cover plate	NEW	1
	9648M01P14	Bearing, No. 4 Ball	NEW	1
	9655M01P13	SEAL RING	NEW	2
	9671M26P09	Bearing, No. 4 Roller	NEW	1
	9698M93G04	NUT	NEW	1
	J643P08A	BOLT, MACHINE	NEW	20
	J644P05D	BOLT	NEW	16
	J644P11A	BOLT	NEW	90
	L21387P03	Bracket	NEW	1
	L21520P01	Bracket	NEW	1
	MS21043-3	NUT	NEW	2
	MS9372-029	GASKET	NEW	1
	MS9373-042	PREFORMED PACKING	NEW	2
	MS9375-038	GASKET	NEW	4
	NAS1102E3-8	SCREW	NEW	18

	NAS1351N3-10	BOLT	NEW	2
	R1393P003L	BOLT	NEW	1
	R1394P003L	BOLT	NEW	1
Repaired Part	Part	Description	Condition	Qty
	9103M30G30	Frame, Compressor Rear	Repair	1
	9174M68G02	Seal, CDP Stationary	Repair	1
	9645M84P02	Nut, 4B Brg Retainer	Repair	1
	9686M44P03	Seal, No. 4R Brg Fwd Stat Air	Repair	1
	9693M20G11	Seal Assy, Aft Stationary Air	Repair	1
	9693M48P04	Seal, No. 4R Brg. Stat Oil	Repair	1
	9693M49P03	Seal, 4R Brg. Stationary Oil	Repair	1
Combustor	Part	Description	Condition	Qty
	9101M29G73	Combustor	Repair	1
HPTR				
Replacement Part	Part	Description	Condition	Qty
	1646M48P11	NUT	NEW	24
	706B788P6	NUT, PUSH ON	NEW	12
	9190M39G07	Damper Assy, Stage 1	NEW	1
	9190M41G04	Damper Assy, Stage 2	NEW	1
	9190M44P03	SHIM, .O15 IN.	NEW	22
	9198M35P02	SHIM, ROUND	NEW	1
	9208M42P01	WASHER	NEW	90
	9208M77P01	WEIGHT	NEW	2
	9208M77P02	WEIGHT, BALANCE	NEW	2
	9208M90P01	BOLT	NEW	88
	9208M91P01	BOLT	NEW	90
	9208M92P01	BOLT	NEW	4
	9208M92P02	BOLT	NEW	4
	9272M68G01	BOLT	NEW	24
	9311M44P01	NUT	NEW	88
	9311M45P01	NUT	NEW	90
	9610M50P01	NUT	NEW	12
	9661M15P04	Adapter, Pressure Tube	NEW	1
	9662M67P01	BOLT	NEW	12
	CH-6783-15P	Blade, HPTR Stage 1	NEW	88
	CH-6784-15P	Blade, HPTR Stage 2	NEW	90
	L25734G05	Shield Assy, HPT Thermal	NEW	1
	L47803P02	SHIM	NEW	22
	L47803P04	SHIM	NEW	22
	MS9204-151	GASKET	NEW	1
Repaired Part	Part	Description	Condition	Qty
	9046M15G18	Seal Assembly, LPT Stationary	Repair	2
	9208M78G09	Shaft Assy, HPT Fwd.	Repair	1
	9208M81P06	Disk, HPTR Stage 1	Repair	1
	9654M80P08	Nut, HPT Coupling	Repair	1
	L25451P05	Disk, HPTR Stage 2	Repair	1
	L31305G01	Shaft Assy, HPTR Rear	Repair	1

HPTN1				
Replacement Part	Part	Description	Condition	Qty
	CH-7455-3PT	Nozzle, HPT Stage 1	NEW	3
	9025M14G01	NUT	NEW	2
	9198M61P02	SEAL	NEW	32
	9198M62P01	SEAL, NOZ-OUTER	NEW	32
	9208M62G02	Baffle Assy, HPT Stage 1	NEW	2
	9208M67G02	COVER	NEW	3
	9610M50P02	NUT, S/L, DBL HEX, 0.250-28	NEW	64
	9662M72P10	BOLT	NEW	64
	9687M54G08	Seal, HPT Inner	NEW	1
	9687M55G08	Seal, HPT Outer	NEW	1
	AN123620	RIVET	NEW	6
	J813P003A	BOLT	NEW	36
Repaired Part	Part	Description	Condition	Qty
	CH-7455-3PT	Nozzle, HPT Stage 1	Repair	28
	CH-7455A-3PT	Nozzle, HPT Stage 1 Borescope	Repair	1
HPTN2				
Replacement Part	Part	Description	Condition	Qty
	CH-6950-16PT	NOZZLE, HPT S2	NEW	5
	1778M48P02	Support, Shroud, HPT S1, H/S	NEW	12
	705B813P2	NUT, PUSH ON	NEW	66
	9082M58G05	Shroud Assy, HPT Stage 2	NEW	2
	9082M63G03	Support Assy, S2 Aft Shroud	NEW	1
	9135M80P02	NUT	NEW	66
	9138M30P01	BOLT	NEW	66
	9155M25P02	BOLT	NEW	33
	9174M20P01	Strip	NEW	3
	9208M51P01	SEAL	NEW	33
	9208M52P01	SEAL	NEW	33
	9208M54P02	SEAL	NEW	11
	9234M87P01	Seal, HPT Stage 2	NEW	19
	9631M84P02	RETAINING RING	NEW	66
	9663M71P01	NUT, S/L	NEW	24
	9686M18P24	SEAL	NEW	48
	9686M18P36	SEAL	NEW	11
	9686M65P01	NUT	NEW	24
	9687M23P03	WASHER	NEW	66
	AN960C10L	WASHER, FLAT	NEW	24
	J903P31C	BOLT, MACHINE	NEW	24
	J979P03	NUT	NEW	33
	L31413P01	TUBE, COOLING AIR	NEW	66
Repaired Part	Part	Description	Condition	Qty
	1347M95G03	Shroud, HPT S1	Repair	48
	9082M58G05	Shroud Assy, HPT Stage 2	Repair	9
	9311M28G05	Seal Assy, Stationary Air	Repair	11
	9687M08G14	Support, HPT Nozzle	Repair	1

	L25739	Nozzle Assy grind	Repair	1
	CH-6950-16PT	NOZZLE, HPT S2	Repair	27
	CH-6950A-16PT	NOZZLE, HPT S2, B/S	Repair	1
TMF				
Replacement Part	Part	Description	Condition	Qty
	9102M54G06	Support, LPT Nozzle, Stage 1	NEW	1
	9109M72P09	NUT	NEW	42
	9146M63P02	BOLT	NEW	42
	9273M62P06	RING, PISTON	NEW	2
	9658M53P03	Bearing, No. 6 Roller	NEW	1
	9665M71P02	GASKET	NEW	1
	9688M08P02	Retainer, Inner Stg 1 Nozzle	NEW	2
	J626P03	NUT	NEW	5
	J643P07A	BOLT	NEW	27
	J644P06D	BOLT	NEW	24
	J644P15A	BOLT	NEW	40
	L31720P01	Bearing, No. 5 Roller	NEW	1
	L44655P01	PACKING	NEW	1
	R1393P003L	BOLT	NEW	2
Repaired Part	Part	Description	Condition	Qty
	9127M42G05	Seal Assembly, Vent Stationary	Repair	1
	9633M62G18	Seal Assy, Cooling & Vent Stat	Repair	1
	L24288G41	Frame, Turbine Mid-	Repair	1
	L24587G03	Seal, 5R Stat Air/Oil	Repair	1
IGB				
Replacement Part	Part	Description	Condition	Qty
	1853M73G01	NUT	NEW	1
	1853M73G02	NUT	NEW	1
	705B276P4	RING	NEW	1
	9600M76P07	Bearing, Duplex, Thrust, Ball	NEW	1
	9600M78P01	Bearing, Cylindrical Roller	NEW	1
	9600M95P03	Gear	NEW	1
	9601M36P04	Spanner Nut	NEW	1
	9607M33P03	GASKET	NEW	1
	9634M10P06	Bearing, Thrust, Duplex Ball	NEW	1
	J201P01	S/L NUT	NEW	22
	J221P006	PREFORMED PACKING	NEW	2
	J221P043	PACKING	NEW	1
	J221P160	PACKING	NEW	1
	J221P902	PACKING	NEW	1
	J221P903	PREFORMED PACKING	NEW	1
	L43680G02	NUT	NEW	1
	NAS560HK3-3	SCREW	NEW	2
	R1393P003L	BOLT	NEW	2
	R1393P012	MACHINED BOLT	NEW	6
	R1394P015	BOLT	NEW	2
Repaired Part	Part	Description	Condition	Qty

	9009M49P01	Housing, Duplex Ball Bearing	Repair	1
	9601M43P01	Housing, Roller Bearing	Repair	1
	9601M71P02	Housing, Bearing	Repair	1
	9671M56P01	Housing, Bearing	Repair	1
	9699M65P15	Housing, Bearing	Repair	1
	9699M65P17	Housing, Bearing	Repair	2
	9699M65P20	Housing, Bearing	Repair	1
	9699M65P23	Housing, Bearing	Repair	5
	9699M80P02	Bearing Housing TGB	Repair	1
	9699M82P02	Housing, Roller Bearing	Repair	1
	9699M87P01	Housing, Duplex Bearing	Repair	1
	9699M92P02	Housing, Bearing	Repair	1
SB-160	Part	Description	Condition	Qty
	L44620G01	Nozzle, Oil, Inlet Gearbox	NEW	1
AGB				
Replacement Part	Part	Description	Condition	Qty
	705B276P10	RING, RETAINING	NEW	2
	705B276P4	RING	NEW	1
	705B276P5	RETAINING RING	NEW	1
	9009M32P01	WASHER	NEW	51
	9009M39P01	SEAL	NEW	2
	9009M45P04	Bearing, Duplex Ball	NEW	1
	9009M53P02	Spanner Nut	NEW	1
	9009M74P03	GASKET	NEW	1
	9013M28P02	GASKET	NEW	1
	9013M29P01	GASKET	NEW	1
	9013M30P02	GASKET	NEW	1
	9116M37P01	BUSHING SLEEVE	NEW	1
	9365M41P229	SEAL O-RING	NEW	1
	9600M76P07	Bearing, Duplex, Thrust, Ball	NEW	1
	9600M91P05	Bearing, Roller	NEW	1
	9601M01P06	Bearing, Annular Ball	NEW	1
	9601M73P07	RING SEAL	NEW	1
	9608M12P04	GASKET	NEW	2
	9609M97P05	Shaft, Radial Drive	NEW	1
	9610M50P02	NUT, S/L, DBL HEX, 0.250-28	NEW	6
	9634M85P01	RING SEAL	NEW	1
	9634M85P06	RING, MATING	NEW	1
	9634M85P08	RING	NEW	1
	9699M03P01	Bearing, Cylindrical Roller	NEW	4
	9699M04P01	Bearing, Roller	NEW	1
	9699M06P01	Bearing, Annular Ball	NEW	1
	9699M09P01	Bearing, Ball	NEW	1
	9699M09P02	Bearing, Annular Ball	NEW	1
	9699M11P01	Bearing, Annular Ball	NEW	1
	9699M12P01	Bearing, Annular Ball	NEW	1
	9699M14P01	Bearing, Roller	NEW	1
	9699M15P01	Bearing, Cylindrical Roller	NEW	1
	9699M66P01	BOLT	NEW	51
	J201P01	S/L NUT	NEW	22

	J201P03	NUT	NEW	8
	J219P02	GASKET	NEW	2
	J219P04	GASKET	NEW	4
	J221P012	O-ring for support/Alt	NEW	1
	J221P014	PACKING	NEW	2
	J221P019	PREFORMED PACKING	NEW	3
	J221P028	PREFORMED PACKING	NEW	1
	J221P124	P.P.	NEW	1
	J221P129	PACKING	NEW	2
	J221P134	PREFORMED PACKING	NEW	2
	J221P138	PREFORMED PACKING	NEW	1
	J221P140	PREFORMED PACKING	NEW	3
	J221P145	PREFORMED PACKING	NEW	1
	J221P148	PACKING	NEW	1
	J221P161	PREFORMED PACKING	NEW	1
	J221P163	PREFORMED PACKING	NEW	1
	J221P166	PREFORMED PACKING	NEW	1
	J221P170	PREFORMED PACKING	NEW	1
	J221P175	PREFORMED PACKING	NEW	2
	J221P214	PREFORMED PACKING	NEW	1
	J221P216	PACKING	NEW	3
	J221P255	PACKING	NEW	1
	J221P263	PACKING	NEW	1
	J221P264	PREFORMED PACKING	NEW	1
	J221P266	O-RING	NEW	1
	J221P904	PREFORMED PACKING	NEW	11
	J221P905	PREFORMED PACKING	NEW	4
	J221P906	PREFORMED PACKING	NEW	2
	J221P908	PREFORMED PACKING	NEW	4
	J221P910	PACKING,PREFORMED	NEW	1
	J221P916	PREFORMED PACKING	NEW	1
	J221P920	PACKING	NEW	1
	L21409P02	Mount Bracket	NEW	1
	L21421P03	Gearshaft, 29-Tooth Bevel	NEW	1
	L21803P02	GASKET	NEW	1
	L31056P01	Gearshaft, 67-Tooth Spur	NEW	1
	M83248/1-121	P.P.	NEW	1
	R304P2A	Gasket	NEW	1
GTA				
Replacement Part	Part	Description	Condition	Qty
	1333M60P01	SPACER, AFT MOUNT	NEW	2
	1443M45P06	TIE DOWN STRAP	NEW	2
	1554M38P01	GASKET	NEW	1
	5032M18P05	RETAINING STRAP	NEW	1
	705B276P5	RETAINING RING	NEW	1
	705B276P6	RETAINING RING	NEW	1
	9011M82G01	Bracket	NEW	1
	9014M99G03	Bracket, Spray Shield	NEW	1
	9033M91G02	Shield, Spray CRF	NEW	1
	9051M54G04	S4 Actuation Ring Conn. Link	NEW	1
	9051M55G04	S5 Actuation Ring Conn. Link	NEW	2

	9051M56G04	S6 Actuation Ring Conn. Link	NEW	2
	9107M23P02	GASKET, COVER	NEW	1
	9116M48P03	STRAP	NEW	1
	9116M48P04	RETAINING STRAP	NEW	2
	9116M48P06	RETAINING STRAP	NEW	1
	9146M80P02	SLEEVE	NEW	36
	9198M65P03	NUT	NEW	36
	9346M79G05	Nut, No. 4 Brg. Spline Split	NEW	1
	9607M05P40	PREF PACKING	NEW	2
	9607M05P41	P.P.	NEW	2
	9608M08G43	GASKET	NEW	1
	9608M08G45	GASKET	NEW	4
	9609M13P02	GUIDE	NEW	2
	9610M50P01	NUT	NEW	12
	9610M50P03	NUT	NEW	228
	9610M50P04	NUT	NEW	18
	9610M81P01	SCREW	NEW	12
	9627M01P02	GASKET	NEW	1
	9627M62P02	Pin, VSV Connecting Link	NEW	13
	9629M62P02	GASKET	NEW	1
	9629M79P116	GASKET	NEW	1
	9629M83G02	GASKET	NEW	4
	9630M72P02	Bolt, VSV Bellcrank	NEW	1
	9632M56P01	CLIP	NEW	14
	9643M56P02	GASKET	NEW	2
	9647M81G01	Bracket, VSV Bellcrank	NEW	1
	9648M79P03	RETAINING RING, NUT 5	NEW	1
	9655M01P10	C-SEAL	NEW	30
	9658M93P02	SEAL-PRESS LOCK	NEW	1
	9661M98P01	PIN	NEW	1
	9662M72P06	BOLT	NEW	72
	9671M28P01	Nut, No. 5 Brg. Inner Race	NEW	1
	9681M48P06	Bushing Assy, Expandable	NEW	1
	9688M06P02	STRIP	NEW	14
	9688M09P01	STRIP	NEW	14
	9688M11P01	WASHER	NEW	14
	9693M05P02	Seal, No. 4 Brg. Rot Air/Oil	NEW	1
	9693M06P04	Heat Shield,No 4 Stat Air Seal	NEW	1
	9693M18P04	RING	NEW	4
	9693M35P08	RING, PISTON	NEW	2
	J1220G10	CLAMP	NEW	2
	J1220G12	CLAMP	NEW	1
	J1220G16	CLAMP	NEW	1
	J1220G20	CLAMP	NEW	1
	J1326P04	THREADED INSERT	NEW	4
	J219P06	GASKET	NEW	1
	J221P008	PREFORMED PACKING	NEW	1
	J221P015	PACKING	NEW	1
	J221P019	PREFORMED PACKING	NEW	30
	J221P028	PREFORMED PACKING	NEW	1
	J221P035	PREFORMED PACKING	NEW	1
	J221P161	PREFORMED PACKING	NEW	1

	J221P225	PREFORMED PACKING	NEW	1
	J221P228	PACKING	NEW	4
	J221P234	PACKING	NEW	4
	J221P240	PREFORMED PACKING	NEW	1
	J221P975	PREFORMED PACKING	NEW	1
	J334P16B	BOLT	NEW	20
	J643P07A	BOLT	NEW	22
	J644P05D	BOLT	NEW	90
	J644P10A	BOLT	NEW	66
	J644P10D	MACHINE BOLT	NEW	16
	J644P16A	BOLT	NEW	40
	J645P10A	BOLT, MACHINE	NEW	36
	J813P010A	BOLT	NEW	48
	L21468G01	TUBE, SEAL	Serviceable	1
	L21564G01	TUBE	NEW	1
	L21522P01	BRACKET	Serviceable	1
	L21604G01	TUBE, FUEL	Serviceable	1
	L21609G01	Tube	NEW	1
	L21633G01	Manifold	NEW	2
	L21610G01	Tube	Serviceable	1
	L21642P01	BRACKET	Serviceable	1
	L21693P02	Cable, Feedback	NEW	1
	L24044P02	BRACKET	NEW	1
	L24316G01	BRACKET	NEW	1
	L24406G02	Tube	NEW	1
	L24435P01	BOLT	NEW	1
	L24435P02	TURBINE FASTENER	NEW	1
	L24436P001A	Bracket	NEW	1
	L24373P001A	Bracket	Serviceable	1
	L31302G01	Rod-End Assembly (RH-Thread)	NEW	2
	L31302G02	Rod-End Assembly (LH-Thread)	NEW	2
	L31303G01	Link, RH-Mount	NEW	1
	L34235G01	BRACKET	Serviceable	1
	L34447G01	BRACKET	NEW	2
	L34448G01	BRACKET	NEW	3
	L34749G01	TUBE	NEW	1
	L43567G02	Bellcrank	NEW	1
	L44655P01	PACKING	NEW	2
	M83248/1-121	P.P.	NEW	1
	M83248/1-912	PREFORMED PACKING	NEW	3
	MS122907	CLAMP	NEW	3
	MS122908	CLAMP	NEW	2
	MS122915	CLAMP	NEW	3
	MS27196-48	GASKET	NEW	1
	MS9375-047	GASKET	NEW	2
Repaired Part	Part	Description	Condition	Qty
	L34716G01	Fuel manifold	NEW	1
	L34714G01	Fuel manifold	NEW	1
	L34692G01	Fuel manifold	NEW	1
	L34692G02	Fuel manifold	NEW	1
	9693M02P03	Seal, No. 4 Brg. Rot Outer Air	Repair	1

	9713M26P05	Bolt, Combustor Pin	Repair	10
	L31421P07	Nozzle, Dual Fuel	Repair	30
	L24407P02	Pump, Lube & Scavenge	Repair	1
	L14469G03	Tube Assy, Oil Cap	Repair	1
	L21751G01	Nozzle, LPT Stage 1	Repair	14
TRF				
Replacement Part	Part	Description	Condition	Qty
	635E901P03	NUT	NEW	15
	9607M05P18	PACKING	NEW	2
	J198P02	NUT	NEW	48
	J221P1108	PACKING	NEW	2
	J644P08B	BOLT	NEW	24
	J644P11A	BOLT	NEW	30
	J644P11C	BOLT	NEW	48
	J644P11D	BOLT	NEW	60
	J645P15A	BOLT	NEW	15
	L11686P01	Bearing, No. 7 Roller	NEW	1
	L11691P03	Bearing, No. 7 Ball	NEW	1
	L15500P01	Spring, Speed Transducer	NEW	1
	L31906P01	BLANKET	NEW	1
	L31907P01	INSULATION BLANKET	NEW	1
	L31908P01	BLANKET	NEW	1
	L31909P02	Insulation Blanket, Thermal	NEW	1
	L43719P01	Brg, No. 7 Roller, Inner Race	NEW	1
Repaired Part	Part	Description	Condition	Qty
	L14421G04	Seal Assembly, Fwd Stat. Air	Repair	1
	L14423P06	SEAL, 7 BRG FWD STAT OIL	Repair	1
	L16710G06	SEAL, AIR (TRF)	Repair	1
	L16712G06	SEAL (TRF)	Repair	1
	L16727G27	Frame Assembly, Turbine Rear	Repair	1
	L21677P02	Manifold, Air/Oil, D-Sump	Repair	1
	L24168P02	Retainer, Speed Transducer	Repair	2
LPTA				
Replacement Part	Part	Description	Condition	Qty
	133A1624P64	WASHER	NEW	90
	9109M91P01	BOLT	NEW	6
	9146M72P01	BEARING, 2R INNER RACE	NEW	1
	9607M80P03	Ring, Keyed Retaining	NEW	1
	9610M50P02	NUT	NEW	42
	9610M50P03	NUT	NEW	28
	9610M82P02	BOLT	NEW	2
	9610M82P03	BOLT	NEW	2
	9610M83P07	BOLT	NEW	2
	9648M79P11	RET RING	NEW	1
	9663M71P07	NUT	NEW	94
	9665M50P01	BOLT	NEW	8
	AS3580-6-18	BOLT	NEW	2
	J198P02	NUT	NEW	60
	J221P020	O-RING	NEW	4

	J221P140	O-RING	NEW	2
	J221P910	O-RING	NEW	1
	J643P05B	BOLT	NEW	12
	J644P05B	BOLT	NEW	5
	J644P07B	BOLT	NEW	6
	J644P11A	BOLT	NEW	12
	J644P11D	BOLT	NEW	40
	J644P13A	BOLT	NEW	122
	J644P15A	BOLT	NEW	12
	J644P17A	BOLT	NEW	4
	J644P23C	BOLT	NEW	36
	J645P05B	BOLT	NEW	1
	J645P13A	BOLT	NEW	15
	J645P17A	BOLT	NEW	5
	L14317P04	GASKET	NEW	1
	L14517P01	GASKET	NEW	2
	L14520P01	SHIM, PACK	NEW	2
	L14522P04	GASKET	NEW	1
	L16501P01	Ring, Keyed Retaining	Serviceable	1
	L16503P01	RING	NEW	1
	L16520P04	GASKET	NEW	2
	L21575P02	Ring, Speed Sensor	Serviceable	1
Repaired Part	Part	Description	Condition	Qty
	9607M78P01	Nut, No. 7 Rear Bearing	Repair	1
	L14408G05	Seal, No. 7 Brg Aft Stat Oil	Repair	1
	L14409G03	Seal Assy, Aft Stationary Air	Repair	1
	L16500P02	Nut, No. 7 Brg Rotating Seal	Repair	1
	L16595G03	Seal Assy, Fwd. Rotating Air	Repair	1
	L21352P01	Nut, Coupling	Repair	1
LPTR				
Replacement Part	Part	Description	Condition	Qty
	612A225P1	washer, HPTR assembly	NEW	36
	705B813P2	NUT, PUSH ON	NEW	176
	9083M19P05	RETAINER	NEW	166
	9083M19P06	RETAINER	NEW	238
	9083M19P07	RETAINER	NEW	90
	9083M19P08	RETAINER	NEW	72
	9610M50P02	NUT	NEW	44
	9610M87P04	NUT S/L	NEW	368
	9632M29P05	BOLT	NEW	192
	9632M29P08	BOLT	NEW	24
	9632M29P10	BOLT	NEW	152
	9632M34P01	PACKING	NEW	1
	9648M79P04	RETAINING RING, SPAN	NEW	1
	9688M46P02	RETAINER	NEW	142
	AS3580-3-26	BOLT	NEW	15
	J201P01	S/L NUT	NEW	36
	J626P03	NUT-SL	NEW	15
	J627P03	NUT, S/L-HEX	NEW	36
	J643P14E	BOLT	NEW	36

	J644P14A	BOLT	NEW	36
	J644P19A	BOLT	NEW	8
	L21172P02	LPT S1 DISK	Serviceable	1
	L21174P02	LPT S3 DISK	Serviceable	1
	MS9565-04	BOLT	NEW	4
	L47571P01	Blade, LPT Stage 1	NEW	39
	L47572P01	Blade, LPT Stage 2	NEW	40
	L47573P01	Blade, LPT Stage 3	NEW	10
	L47574P01	Blade, LPT Stage 4	NEW	5
	L47575P01	Blade, LPT Stage 5	NEW	1
Repaired Part	Part	Description	Condition	Qty
	9010M36G02	Seal Assy, Balance Rotating	Repair	1
	9102M36P07	Blade, LPT Stage 6	Repair	72
	9602M48P04	Seal, Air, No. 6 Bearing	Repair	1
	9607M35P02	Nut, No. 6 Bearing, Plain	Repair	1
	9632M97G03	Shield Assembly	Repair	1
	L14475P02	Supt Balance Rtg Piston Seal	Repair	1
	L16742P02	Seal, Balance Piston Rotating	Repair	1
	L47571P01	Blade, LPT Stage 1	Repair	127
	L47572P01	Blade, LPT Stage 2	Repair	102
	L47573P01	Blade, LPT Stage 3	Repair	116
	L47571P01	Blade, LPT Stage 1	Recoat Repair	39
	L47572P01	Blade, LPT Stage 2	Recoat Repair	40
	L47573P01	Blade, LPT Stage 3	Recoat Repair	10
	L47574P01	Blade, LPT Stage 4	Repair	107
	L47575P01	Blade, LPT Stage 5	Repair	89
	L47576P01	Blade, LPT Stage 6	Repair	72
LPTS				
Replacement Part	Part	Description	Condition	Qty
	9102M46G04	S2 SEAL	Serviceable	1
	9102M46G05	Seal Assy, Stage 2 Air	NEW	2
	9102M46G06	S2 SEAL	NEW	1
	9102M47G04	Seal Assy, Stage 3 Air	NEW	1
	9102M47G05	SEAL S3	NEW	2
	9102M49G04	S6 SEAL	NEW	1
	9109M72P09	NUT	NEW	180
	9138M86P04	LOCK, NOZ	NEW	108
	9147M29P01	BOLT	NEW	172
	9147M29P02	BOLT	NEW	14
	9632M38P09	INSULATOR	NEW	2
	9632M38P10	INSULATOR	NEW	2
	9632M38P11	INSULATOR	NEW	2
	9632M76P01	WASHER	NEW	108
	9663M23G10	Seal Assy, Stage 3 Air	NEW	11
	9663M24G22	Seal Assy, Stage 3 Air	NEW	3
	9663M71P07	NUT	NEW	174
	9688M01P03	BOLT	NEW	38
	9688M01P04	BOLT	NEW	28
	9688M03P01	WASHER	NEW	280
	9688M04P01	STRIP	NEW	4

	9688M04P02	STRIP	NEW	6
	9688M04P03	STRIP	NEW	4
	9688M04P04	STRIP	NEW	6
	9688M04P09	STRIP	NEW	38
	9688M07P01	STRIP	NEW	12
	9688M07P02	STRIP	NEW	14
	9688M20P02	Cover Seg Stg 1 Nozzle Insul	NEW	1
	L21495P01	INSULATOR, NOZZLE	NEW	2
	L21495P02	INSULATOR, NOZZLE	NEW	2
	L21495P03	INSULATOR, NOZZLE	NEW	2
	L21760P02	Spacer, Stage 2 Seal	Serviceable	1
	L47453G02	Insulator, Stage 1 Nozzle	NEW	2
	L21752G04	Nozzle, LPT Stage 2	NEW	3
	9663M04P04	Nozzle, LPT Stage 4	NEW	2
Repaired Part	Part	Description	Condition	Qty
	1815M18G04	Case, LPT Stator estimate	Repair	2
	9102M46G04	Seal Assembly, Stage 2 Air	Repair	2
	9102M46G05	Seal Assembly, Stage 2 Air	Repair	2
	9102M46G06	Seal Assembly, Stage 2 Air	Repair	2
	9102M47G04	Seal Assy, Stage 3 Air	Repair	2
	9102M47G05	Seal Assy, Stage 3 Air	Repair	4
	9102M47G06	Seal Assy, Stage 3 Air	Repair	2
	9102M48G03	Seal Assembly, Stage 4 Air	Repair	6
	9102M48G04	Seal Assembly, Stage 4 Air	Repair	2
	9102M49G03	Seal Assembly, Stage 5 Air	Repair	8
	9102M49G04	Seal Assy, Stage 6 Air	Repair	8
	9663M23G10	Shroud Assembly, Stage 1	Repair	3
	9663M24G19	Shroud Assembly, Stage 2	Repair	14
	9663M24G22	Shroud Assembly, Stage 3	Repair	14
	9663M69G18	Shroud Assembly, Stage 4	Repair	18
	9663M69G20	Shroud Assembly, Stage 5	Repair	16
	9663M70G11	Shroud Assembly, Stage 6	Repair	16
	L21752G04	Nozzle, LPT Stage 2	Repair	11
	L21753P03	Nozzle, LPTS Stage 3	Repair	16
	9663M04P04	Nozzle, LPTS Stage 4	Repair	7
	9663M05P05	Nozzle, LPTS Stage 5	Repair	16
	9663M06P06	Nozzle, LPTS Stage 6	Repair	16

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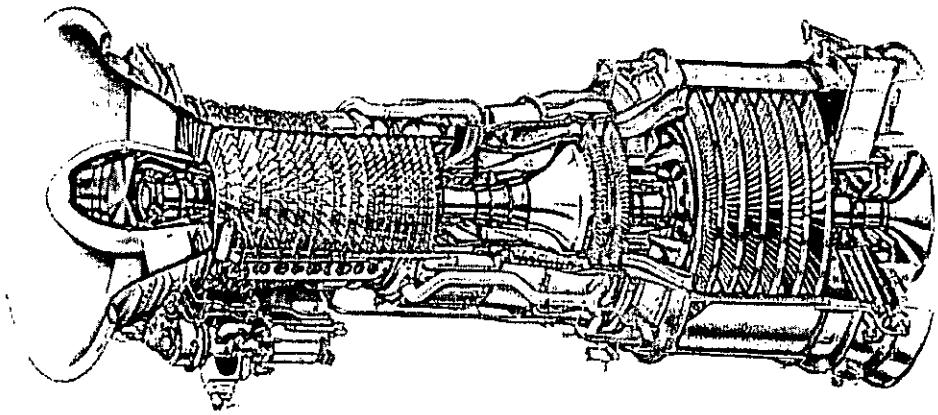
APPENDIX E: TEST REPORT

TRANSCANADA TURBINES
The Independent Alternative

150 Palmer Road North East
Calgary, AB, Canada T2E 7R3
Telephone: (403) 219 6600
Fax: (403) 219-6666

Sales Order: 06-2LM-060
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

General Electric LM2500 Engine Test Report



Test Details

Sales Order:	06-2LM-060	**Engine Type:**	LM2500-PE
Work Order:	01607L	**Test Schedule:**	GEK99418
Customer:	Maui Power	**Test Standard:**	OVERHAUL
ESN:	481-669	**Test Date:**	2007-05-01
Test Cell:	Calgary	**Test Operator:**	M. Gillies
Fuel Used:	NGAS (431.8GJ)	**Test Observer:**	K. Roberts
Running time:	4.5 Hrs	**Oil:**	MIL-L-23699

Test Result:	PASS

Report Author:	B Butler	**To:**	W Martin
Report Date:	09-May-2007	**Copy To:**	K McGregor, S Caldwell

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Test Date: 2007-05-01

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1. Test Objectives

The following test procedures are to be conducted in general accordance with ASME PTC-22, 1997, and the listed OEM test schedules:

1. VSV check-out/Scheduling	GEK 99418 Figure 19-1
2. Steady state Break-in/Vibration Survey	GEK 99418 Table 19-15
3. Acceptance Test – Schedule A	GEK 99418 Table 19-16

2. Description of Equipment for Test

The following is a description of the TCT equipment rigged for the test:

- Test adaptor mounting, to support engine whilst in the test cell
- Exhaust nozzle, to simulate back pressure from power turbine
- Bell mouth and bullet nose
- Additional instrumentation for monitoring of gas path pressures and temperatures (Section 3)
- Fuel, oil, start air and instrument lines are connected between engine and test cell

Equipment configuration on the test engine:

Bearing Config. 3R:	DAMPER
Speed Sensor P/N:	0
VG Controller:	L34379
A4 Area	54.23
Bell Crank P/N:	L43567
HPRC Diameter:	0.6

HP Recoup is slightly larger than calculated on the Functional acceptance sheet. This parameter will quickly come into limits in the first 24 hrs of operation and for the first 400 hrs periodic adjustment of the orifice size is required as determined by the HP Recoup Orifice size selection calculation.

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Sales Order: 06-2LM-060
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

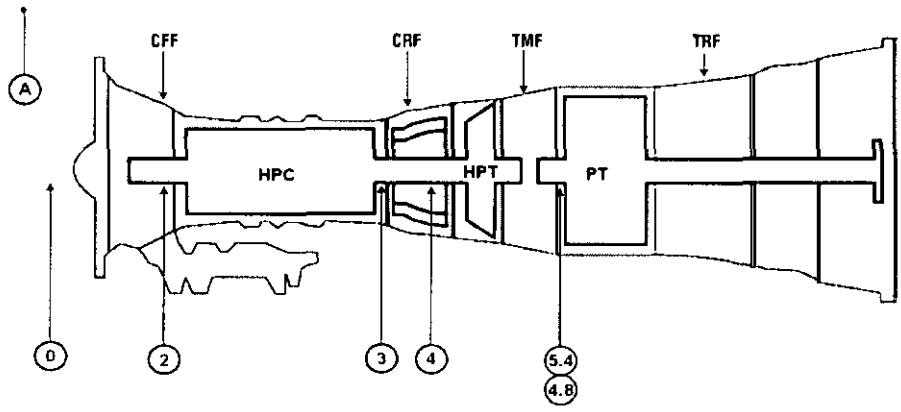
3. Test Measurement Description

Various instrumentation points along the main gas path are identified with "aerodynamic station numbers" for monitoring temperature and pressure characteristics of the main gas flow. The table below shows the station descriptions, and the figure shows the location of the LM2500 test stations referred in this document. All recorded data can be found in Appendix A of this report.

No	Description	Measurements
A	Ambient	Ambient pressure - Barometer Relative humidity
0	Air Inlet	Temperature, T1 - 3 RTD's Cell pressure, P0 - 1 transducer
2	Compressor Inlet	Speed probe, NGG - magnetic pickup Pressure, P1 – Static tappings
3	Compressor Discharge	Temperature, T3 - 1 type K thermocouple Pressure, PS3 - transducer for 1 static tapping
4	Combustor Section	Fuel flow - 1 Coriolis flow meter Fuel temperature, TFG – RTD Fuel pressure, PFG - transducer for 1 static tapping
5.4 (4.8)	Power Turbine Inlet	Temperature, T54 – 11 type K thermocouples Pressure, P48 – 1 total tapping

Other instrumentation included in the test not related to the gas path:

- Analysis of the gas composition from a chromatograph (for each steady-state recording)
- Temperatures for the oil scavenge for sumps A, B, C and D, oil supply, oil return (post cooler) are all measured with RTD's.
- Pressures for the main oil supply and lube oil scavenge measured with transducers
- Vibration transducers mounted on the CFF, CRF and TMF
- VSV angle – solenoid relative position to datum
- HP Recoup pressures A and B measured with Scani-Valve pressure transducer



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4. Correction Methods

The data reduction method performed on the recorded gas path test data uses the GE LM2500 Performance Program (for gas fuel) Version 1.00. This uses industry standard ISO correction calculations applied to the measured gas path parameters to correct to the standard conditions of ambient temperature of 15°C (59°F) and sea level pressure of 14.696 PSIA. The correction formulae are in the form of:

ISO Corrected Value = Recorded Value * Thetaθ * Deltaδ
ISO Corrected Heat rate = 3600 * (ISO Corrected Fuel flow * LCV) / IGHPK

Where
Theta = 288.15K / Test ambient temperature
Delta = 14.696 PSIA / Test ambient pressure
θ = OEM proprietary correction exponent for temperature
δ = OEM proprietary correction exponent for pressure
LCV = Lower calorific value of fuel
IGHPK = ISO Corrected isentropic engine gas horse power

Isentropic engine gas horse power, delta WF and delta T54 are thermodynamic GE proprietary calculations that are output via the GE LM2500 performance program.
All corrected data can be found in Appendix A of this report.

All test facility owned instrumentation for the test has been fully calibrated according to TCT quality procedures.

The Data Acquisition System (DAS) 'Engine Test' version 4.2.68 was used to record the engine test data. The data was stored in the 'Engine Test' database version 1.0. For steady-state performance readings, the engine was stabilized at each test data recording for 5 minutes. An analysis of the gas composition was taken for each performance reading for the fuel flow and heat rate calculations.

5. Test Notes / Adjustments

Sump flow check performed. Vibration instrumentation verified. A blanking plug was recovered from the Air/Oil Separator scavenge line. It was causing a partial blockage of the line, which resulted in poor separator performance and oil spewing. Lube oil pressure

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Sales Order: 06-2LM-060
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

6. Test Results

This section documents the test acceptability for the test engine against each of the test schedule requirements. Appendix A tabulates the raw and standard day corrected data recorded during the test. Appendix B contains the charts for the VSV, vibration and schedule A performance objectives.

General	Units	Value	Limit	Type	Pass/Fail
GG Roll Down Time	sec	330	NPL	N/A	N/A

Vibration Limit Check	Units	Value	Limit	Type	Pass/Fail
Compressor Front Frame Vib SS	mpp	0.656	NPL	N/A	N/A
Compressor Rear Frame Vib SS	mpp	0.387	2	Max	Pass
Turbine Mid Frame Vib SS:	mpp	0.340	NPL	N/A	N/A
Compressor Front Frame Vib TR	mpp	0.670	NPL	N/A	N/A
Compressor Rear Frame Vib TR	mpp	0.500	3	Max	Pass
Turbine Mid Frame Vib TR	mpp	0.300	NPL	N/A	N/A

Oil Pressure	Units	Value	Limit	Type	Pass/Fail
Table used for correction purposes:		19-5	NPL	N/A	N/A
Correction Factor:	psi	0.7	NPL	N/A	N/A
Corrected Oil Pressure:	psig	56.66	45	Min	Pass
Corrected Oil Pressure:	psig		55	Max	See EPP021

Oil Consumption	Units	Value	Limit	Type	Pass/Fail
Lube oil consumption	pph	0	1	Max	Pass

VSV Geometry	Units	Value	Limit	Type	Pass/Fail
VSV within limits:		Yes	Yes	Equal	Pass

Oil Temperature	Units	Value	Limit	Type	Pass/Fail
Scavenge Temp A	deg F	203.0	260	Max	Pass
Scavenge Temp B	deg F	246.4	260	Max	Pass
Scavenge Temp C	deg F	266.2	260	Max	See EPP021
Scavenge Temp D	deg F	165.3	N/A	Max	Pass
Scavenge Temp AGB	deg F	156.1	260	Max	Pass
Delta Temp A	deg F	42.6	NPL	N/A	N/A
Delta Temp B	deg F	86.0	NPL	N/A	N/A
Delta Temp C	deg F	105.8	NPL	N/A	N/A
Delta Temp D	deg F	4.9	NPL	N/A	N/A
Delta Temp AGB	deg F	-4.3	NPL	N/A	N/A

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Sales Order: 06-2LM-060
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Engine Test Rating Point

Test Parameter	Units	Acceptance Summary
T54 rating point	deg F	1,535
SFC	btu/hp hr	6294
IGHP	HP	39712
Delta Wf	%	2.82
Delta T54	deg F	-5.9
Delta T54 (Wf)	deg F	88.8

Rating Points used in the determination of the acceptance values

Parameter	Units	Point 1	Point 2	Point 3	Point 4	Point 5
Date		01/05/07	01/05/07	01/05/07	01/05/07	01/05/07
Time		14:46:36	14:53:26	15:00:57	15:07:43	15:14:10
Corrected Ng (NGGK)	RPM	9214	9002	8807	8506	8187
Corrected Isentropic Gas Power	HP	28,506	23,845	19,102	13,546	8,643
Corrected Fuel Flow	PPS	9,601	8,316	6,981	5,434	3,998
Corrected SFC	lb/shp.hr	0.337	0.349	0.365	0.401	0.463
Corrected SFC	btu/hp.hr	6403	6631	6935	7619	8797
Corrected T54 (T54I)	deg R	1818	1739	1653	1526	1386
Corr. Comp Airflow (W2K)	deg F	139	131	122	108	94
Delta New Fuel Flow	PPS	2.34	1.85	0.97	0.51	-0.32
Delta New T54	%	-25.8	-23.8	-15.6	3.6	44.1
Delta New T54 (Fuel Flow)	deg F	63.1	45.9	21.8	10.1	-5.6

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Sales Order: 06-2LM-060
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Appendix A Observed and Corrected Test Data

Points used in the determination of the Rated acceptance values

Test Point	Units	Scan 1	Scan 2	Scan 3	Scan 4	Scan 5
Date		1-May-07	1-May-07	1-May-07	1-May-07	1-May-07
Time		14:46:36	14:53:26	15:00:57	15:07:43	15:14:10
NGG	rpm	9185.8	8974.8	8779.9	8479.8	8174.9
NG 01	rpm	9187.6	8973.6	8781.6	8479.7	8174.5
NG 02	rpm	9185.1	8977.1	8780.9	8478.6	8174.5
T1	deg F	55.9	56.1	56.1	56.1	57.8
T2	deg F	55.9	55.9	55.9	56.3	57.5
T3	deg F	783.1	745.7	708.4	655.4	603.1
T5.4 1	deg F	1315.7	1235.6	1148.4	1022.8	889.6
T5.4 2	deg F	1381.8	1296.6	1202.2	1069.3	916.3
T5.4 3	deg F	1367.9	1266.9	1163.3	1014.8	870.0
T5.4 4	deg F	1361.3	1264.7	1168.2	1033.4	889.4
T5.4 5	deg F	1345.2	1254.8	1159.2	1029.4	898.3
T5.4 6	deg F	1315.7	1232.1	1147.2	1027.4	900.3
T5.4 7	deg F	1289.9	1218.6	1140.8	1017.5	887.2
T5.4 8	deg F	1314.1	1233.6	1151.7	1029.5	905.7
T5.4 9	deg F	1252.9	1183.8	1104.5	980.6	865.0
T5.4 10	deg F	1251.8	1169.6	1089.1	974.9	860.9
T5.4 11	deg F	1322.8	1244.3	1149.7	1019.2	888.9
T5.4	deg F	1320.0	1236.4	1147.7	1019.9	888.3
T5.4 Spread 1	deg F	-4.2	-0.9	0.8	2.9	1.3
T5.4 Spread 2	deg F	61.8	60.2	54.5	49.4	28.0
T5.4 Spread 3	deg F	47.9	30.5	15.6	-5.1	-18.3
T5.4 Spread 4	deg F	41.3	28.3	20.5	13.5	1.1
T5.4 Spread 5	deg F	25.3	18.4	11.5	9.4	10.0
T5.4 Spread 6	deg F	-4.2	-4.3	-0.5	7.5	12.0
T5.4 Spread 7	deg F	-30.1	-17.9	-6.8	-2.4	-1.1
T5.4 Spread 8	deg F	-5.9	-2.8	4.0	9.6	17.4
T5.4 Spread 9	deg F	-67.0	-52.6	-43.1	-39.3	-23.3
T5.4 Spread 10	deg F	-68.2	-66.8	-58.5	-45.0	-27.4
T5.4 Spread 11	deg F	3.4	7.8	2.0	-0.7	0.4
T5.4 Spread Max	deg F	61.8	60.2	54.5	49.4	28.0
T5.4 Spread Min	deg F	-67.7	-66.7	-58.5	-44.8	-27.3
T5.4 Spread Total	deg F	130.0	127.0	113.0	94.4	55.4
Oil Scavenge Temp A	deg F	205.3	201.3	199.6	196.3	193.7
Oil Scavenge Temp B	deg F	249.7	243.8	238.0	231.3	226.3
Oil Scavenge Temp C	deg F	268.1	258.9	250.6	240.4	229.4
Oil Scavenge Temp D	deg F	167.8	165.3	162.8	160.5	158.6
Oil Scav Temp AGB	deg F	159.2	157.2	156.1	154.5	153.6
Oil Scav Delta Temp A	deg F	43.4	39.4	39.3	37.2	35.6
Oil Scav Delta Temp B	deg F	87.8	82.0	77.7	72.2	68.2
Oil Scav Delta Temp C	deg F	106.2	97.1	90.3	81.3	71.3
Oil Scav Delta Temp D	deg F	5.8	3.5	2.5	1.4	0.5
Scav Delta Temp AGB	deg F	-2.8	-4.7	-4.2	-4.7	-4.6
Oil Return Temp *	deg F	209.6	204.6	201.3	197.5	193.7

* Post Cooler

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Sales Order: 06-2LM-060
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Test Point	Units	Scan 1	Scan 2	Scan 3	Scan 4	Scan 5
Date		1-May-07	1-May-07	1-May-07	1-May-07	1-May-07
Time		14:46:36	14:53:26	15:00:57	15:07:43	15:14:10
Oil Supply Temp	deg F	162.0	161.9	160.3	159.1	158.2
P0	inhga	26.17	26.17	26.17	26.17	26.17
P1	inhga	26.07	26.07	26.08	26.09	26.11
P2 Tav	inH2Og	0.43	0.37	0.29	0.23	0.22
PS3	psig	195.98	178.19	159.03	133.43	107.32
PT5.4	psig	33.99	30.03	25.70	20.11	14.37
HPRCP A	psig	61.05	60.18	57.01	49.36	40.71
HPRCP B	psig	61.35	60.64	57.17	49.77	41.25
Main Oil Press	psig	55.85	53.41	50.46	47.95	44.98
Lube Oil Scav Press	psig	8.44	8.48	8.63	8.46	8.45
Gas Manifold Press	psig	223.51	201.50	176.88	145.73	115.79
CFFV	mils pp	0.560	0.337	0.443	0.396	0.305
CRFV	mils pp	0.310	0.116	0.177	0.272	0.387
TMFV	mils pp	0.340	0.150	0.240	0.290	0.266
TRFV	mpp	0.340	0.150	0.240	0.290	0.266
VSV Angle	deg	-2.2	0.4	3.2	7.3	11.6
IGHPK	hp	28506	23845	19102	13546	8643
Corrected SFC	btu/ighpr	6403	6631	6935	7619	8797
Delta New T54	deg F	-25.8	-23.8	-15.6	3.6	44.1
NGGKVSV	rpm	9212	9001	8806	8506	8187
NGGK	rpm	9214	9002	8807	8505	8187

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Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Corrected Test Data

Test Point	Units	Scan 1	Scan 2	Scan 3	Scan 4	Scan 5
Date		1-May-07	1-May-07	1-May-07	1-May-07	1-May-07
Time		14:46:36	14:53:26	15:00:57	15:07:43	15:14:10
NGGK	rpm	9214	9002	8807	8506	8187
IGHPK	hp	28506	23845	19102	13546	8643
Corrected Fuel Flow	pps	9601	8316	6981	5434	3998
Corrected SFC	lbm/hp.hr	0.337	0.349	0.365	0.401	0.463
Corrected SFC	btu/hpr	6403	6631	6935	7619	8797
Corrected T54	deg R	1818	1739	1653	1526	1386
Corr. Comp Airflow W2K	pps	139.1	131.0	121.8	108.4	93.8
Delta New Fuel Flow	%	2.34	1.85	0.97	0.51	-0.32
Delta New T54	deg F	-25.8	-23.8	-15.6	3.6	44.1
Delta New T54 (Wf)	deg F	63.1	45.9	21.8	10.1	-5.6
NGG Tav	rpm	9186	8975	8780	8480	8175
T2 Tav	deg F	55.9	55.9	55.9	55.9	57.5
T3 Tav	deg F	782.8	745.7	708.0	655.2	603.1
T5.4 Tav	deg F	1320.0	1236.4	1147.7	1019.9	888.3
P0 Tav	inhga	26.18	26.17	26.17	26.17	26.17
P2 Tav	inH2Og	0.43	0.37	0.29	0.23	0.22
PS3 Tav	psig	196.0	178.2	159.0	133.4	107.3
PT5.4 Tav	psig	34.0	30.0	25.8	20.1	14.4
Selected Fuel Flow Tav	pph	7578.7	6548.1	5485.5	4260.4	3137.2
LHV Tav	btu/lbm	21059	21059	21059	21059	21059
AE8 Calculated	sqin	221.5	221.1	220.5	219.8	218.7
Fuel Air Ratio	n/a	0.0194	0.0178	0.0160	0.0140	0.0119
T54B Calculated	deg R	1863	1764	1653	1521	1385
P3 Calculated	psia	216.9	198.5	178.8	152.5	125.6
Exhaust Nozzle Flow Fund	n/a	114.9	114.8	114.7	114.6	114.2
Delta T54	deg R	83.2	68.3	45.5	41.5	37.5
IGHP	hp	24725	20689	16585	11768	7526
Compressor Airflow W2	pps	121.4	114.3	106.4	94.8	81.9
Compressor Efficiency	n/a	85.61%	86.44%	86.74%	86.83%	85.84%
Corrected NG for VSV	rpm	9212	9001	8806	8506	8187
Corrected T54	deg F	1358	1279	1193	1066	927
Correction Factor - Delta	n/a	0.871	0.871	0.872	0.872	0.873
Correction Factor - Theta	n/a	0.994	0.994	0.994	0.994	0.997
Corrected NG (NGGK)	rpm	9214	9002	8807	8505	8187
Corrected T54 *	deg F	1328.0	1243.9	1154.7	1026.1	890.8
Corrected Wf *	pph	8672.8	7492.4	6273.9	4870.6	3590.1

* Standard Day

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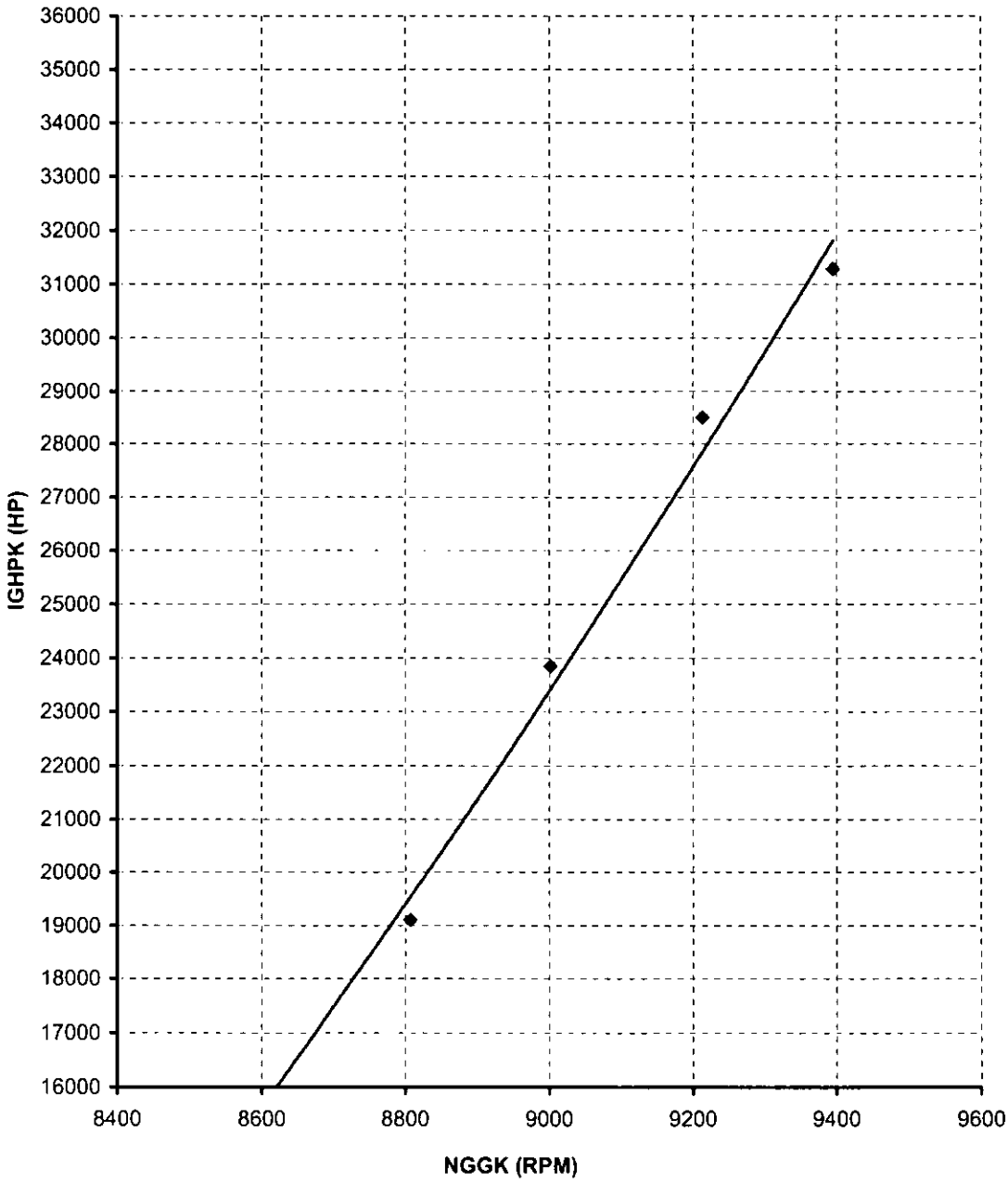
Engine No: 481-669
Test Date: 2007-05-01

Appendix B Performance and Mechanical Charts

Chart 1 – ISO Corrected Engine shaft speed verses Isentropic EGHP

All data points represent the engine at the steady-state condition



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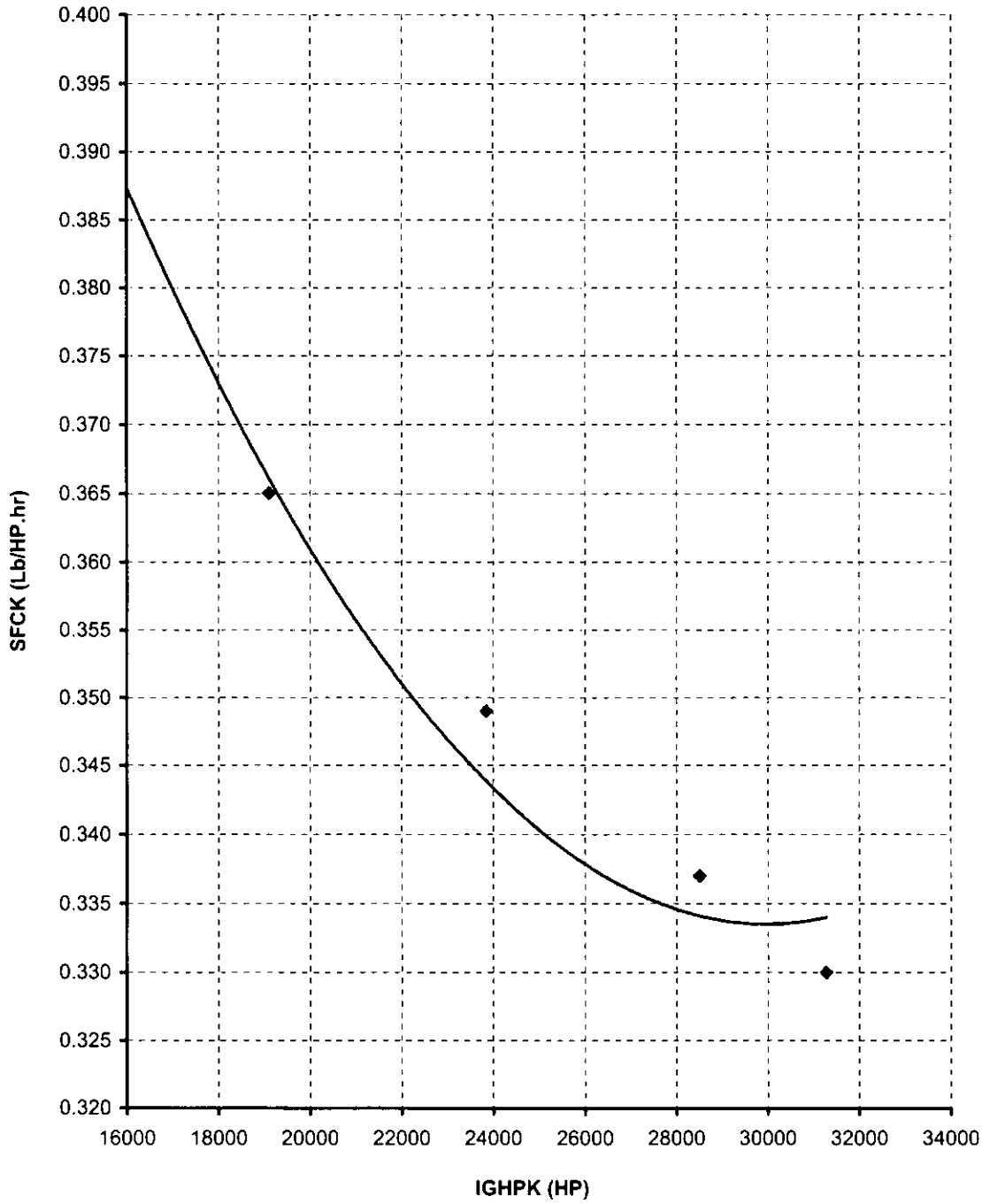
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Chart 2 – ISO Corrected isentropic EGHP verses Specific fuel consumption

All data points represent the engine at the steady-state condition



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Sales Order: 06-2LM-060
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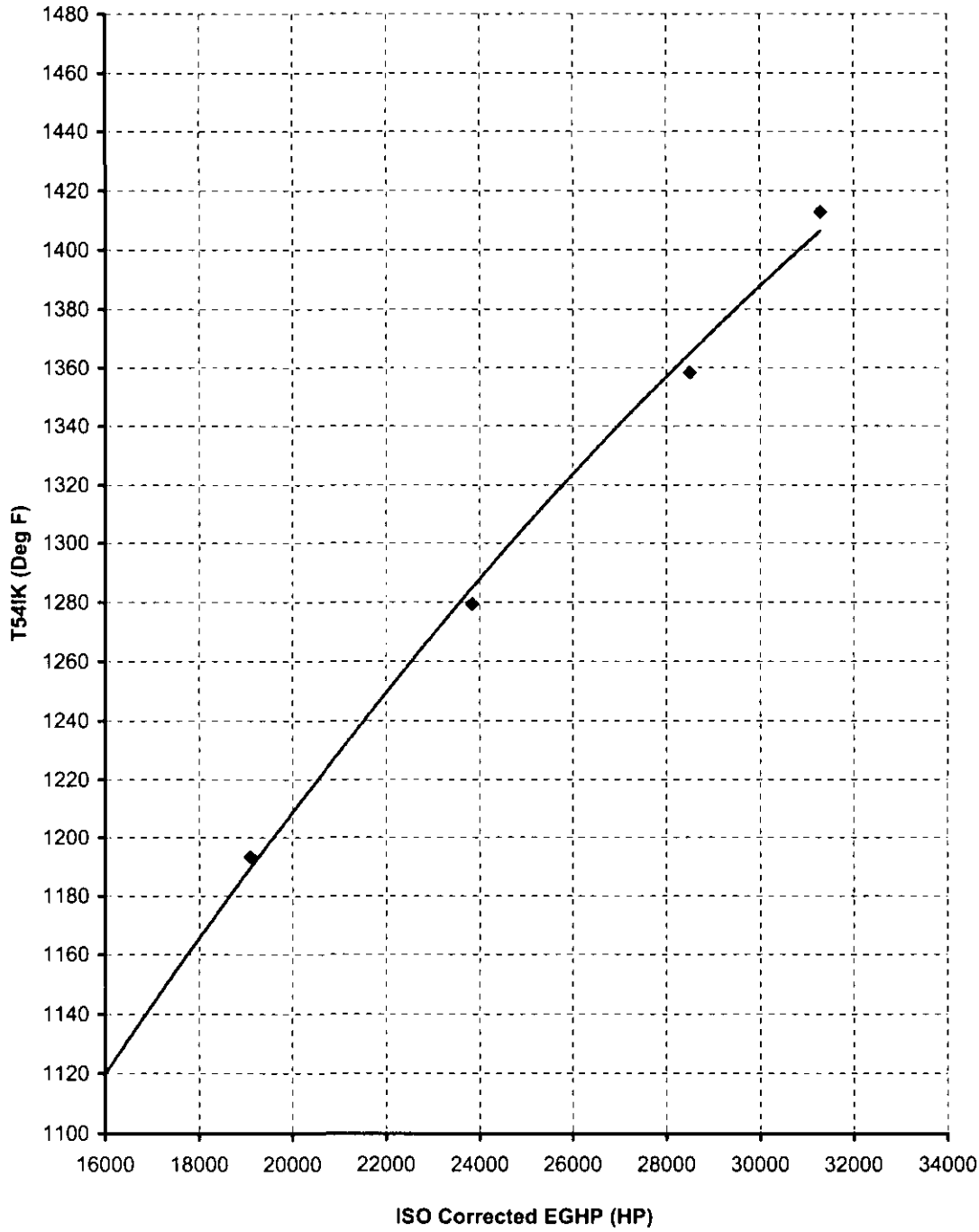
Engine No: 481-669
Test Date: 2007-05-01

Chart 3 – ISO Corrected isentropic EGHP verses Exhaust exit temperature

All data points represent the engine at the steady-state condition



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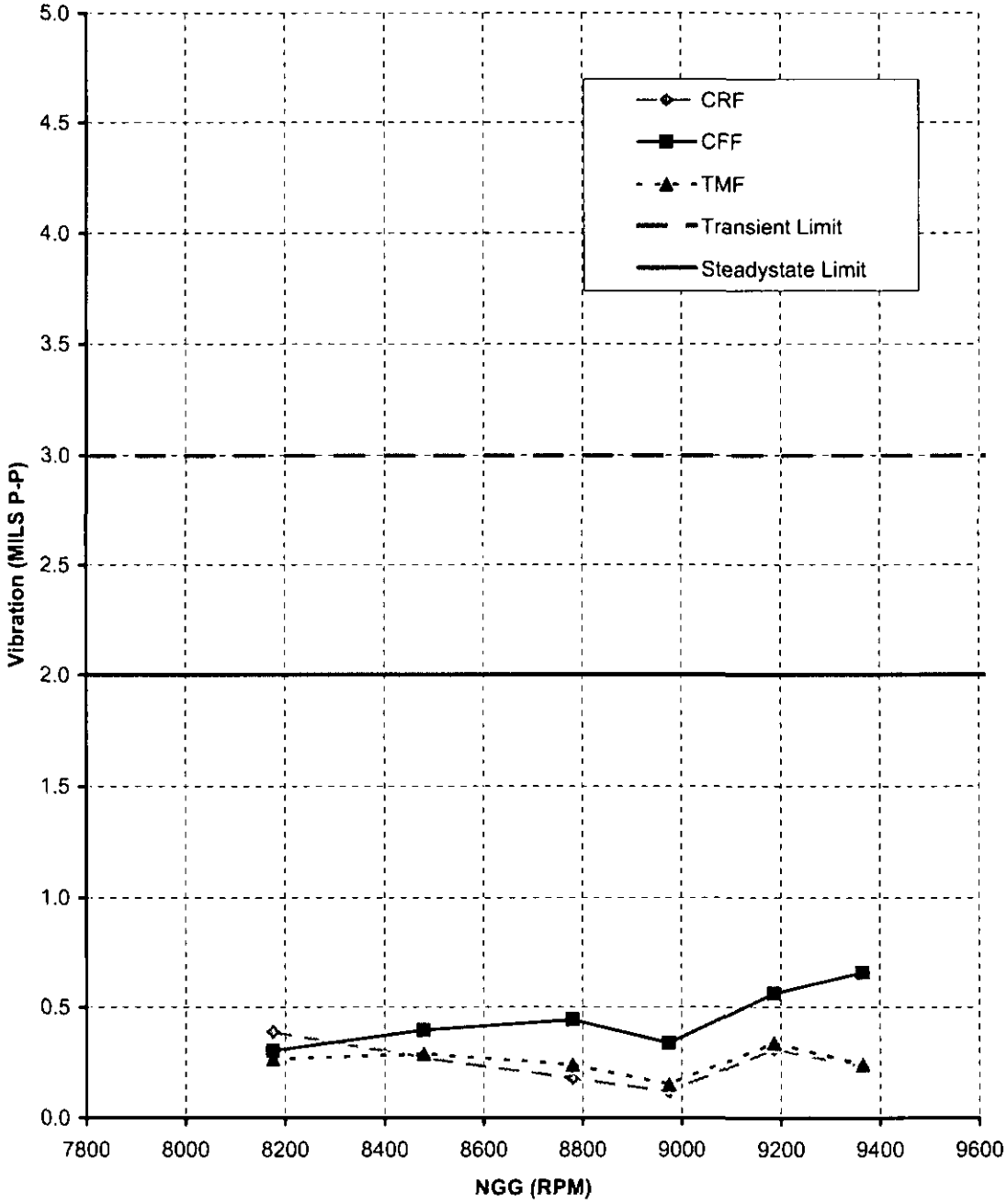
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Chart 4 – Steady-State vibration survey

All data points represent engine at steadystate condition



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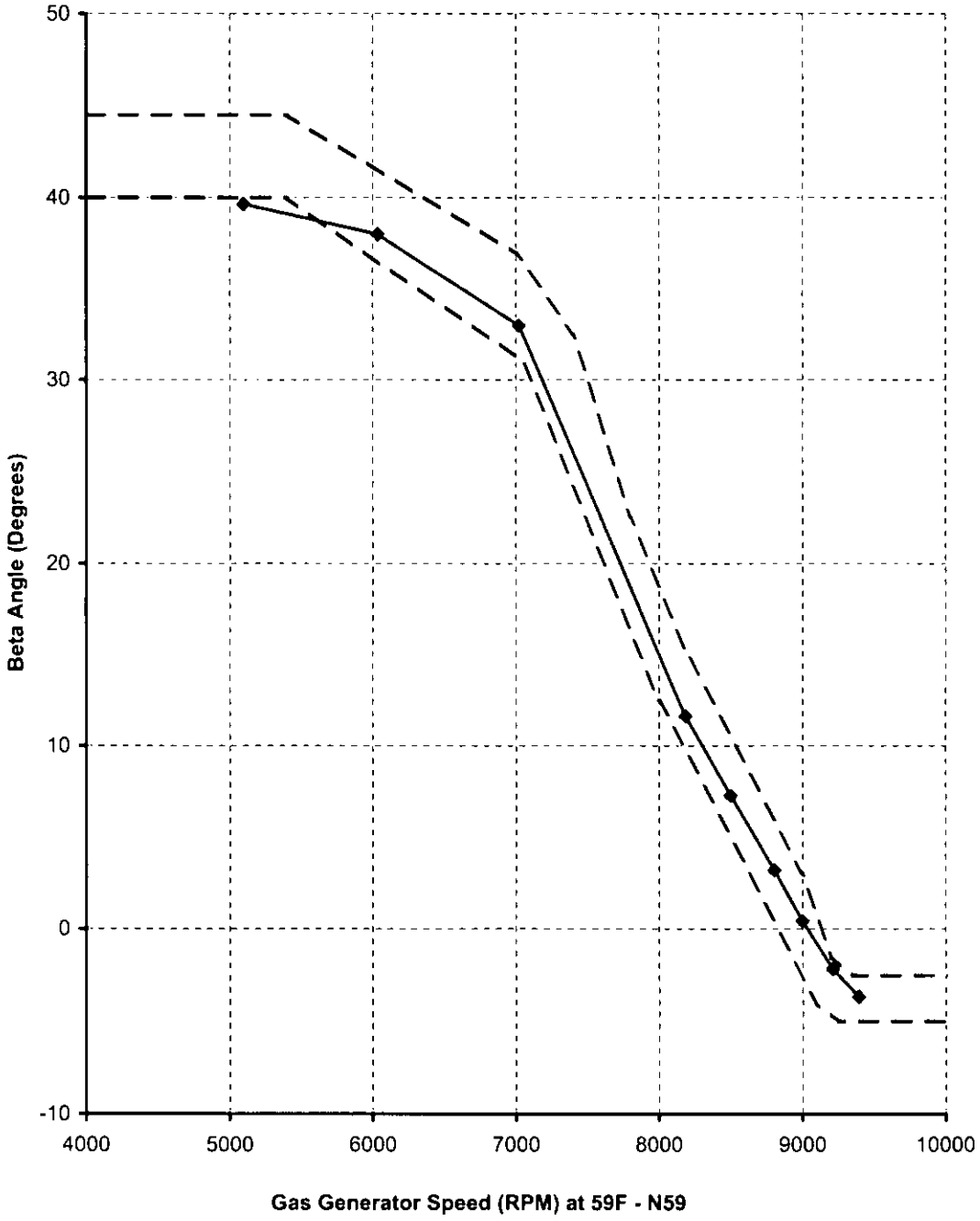
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Chart 5 – GEK 99418 Figure 19-1 VSV Schedule



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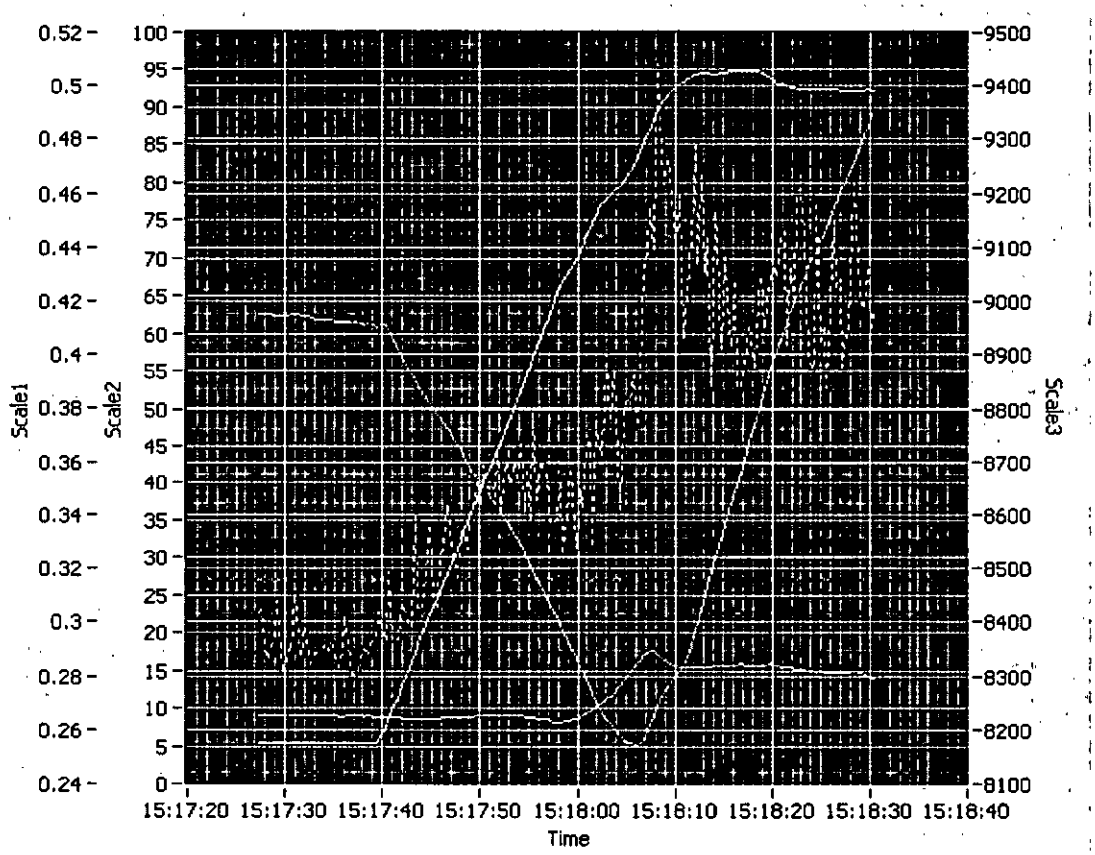
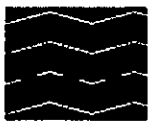
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Chart 6 - Acceleration Vibration Trend

Schedule A acceleration trend plot from NL=8200rpm to 9400rpm (corrected).



NG (RPM)		(Scale 3)
Vibration CRF (MPP)		(Scale 1)
Vibration CFF (MPP)		(Scale 1)
Vibration TMF (MPP)		(Scale 1)

Maximum vibration values recorded during Acceleration

Vibration CRF (MPP)	1.272
Vibration CFF (MPP)	1.19
Vibration TMF (MPP)	1.079

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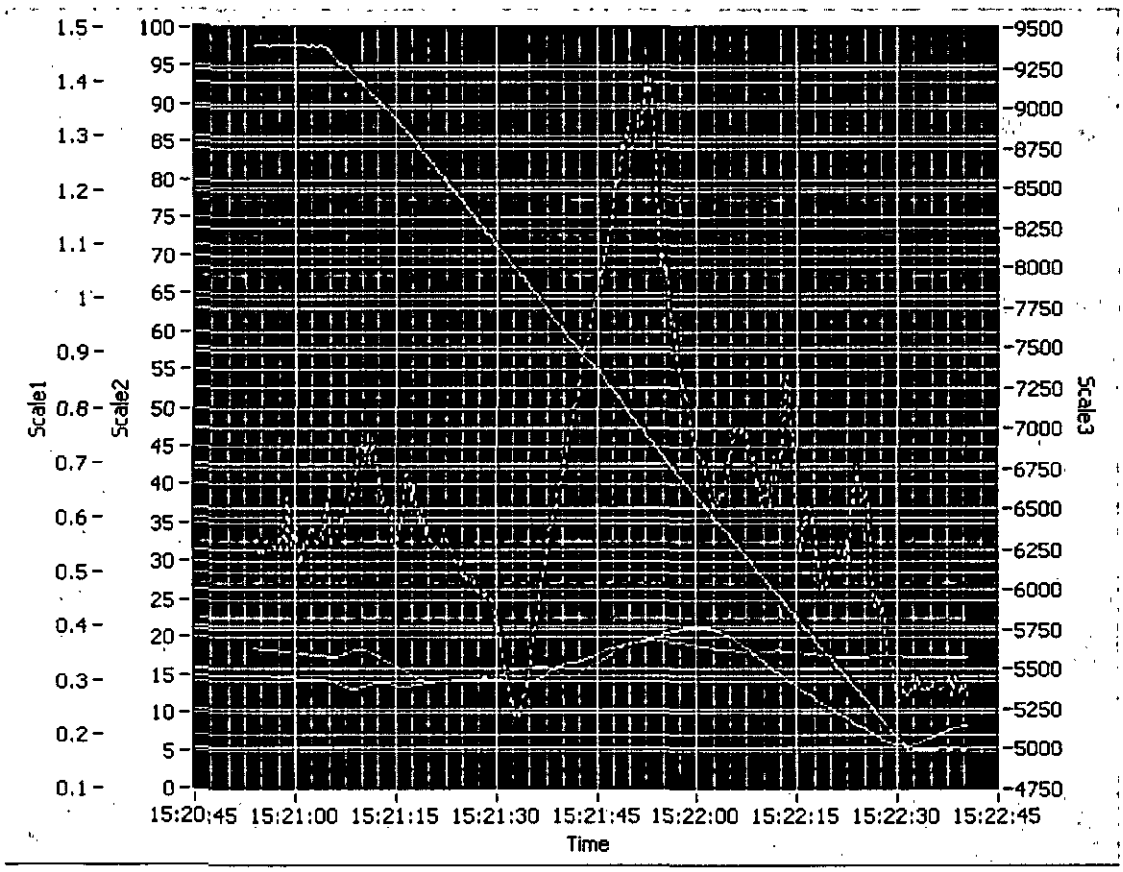
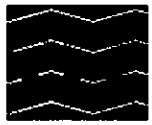
Customer: Maui Power
Engine No: 481-669
Test Date: 2007-05-01

Chart 7 - Deceleration Vibration Trend

Schedule A deceleration trend plot from NL=9400rpm corrected to idle.



NG (RPM)		(Scale 3)
Vibration CRF (MPP)		(Scale 1)
Vibration CFF (MPP)		(Scale 1)
Vibration TMF (MPP)		(Scale 1)

Maximum vibration values recorded during Deceleration

Vibration CRF (MPP)	1.591
Vibration CFF (MPP)	1.114
Vibration TMF (MPP)	1.077

TRANSCANADA TURBINES We know your business.	ENGINEERING PRODUCTION PERMIT	TCT-EPP021

Subject: 481-669 High Lube Oil Pressure and Scavenge Temperature on Test

Engine Type/Model: LM2500	Section/Module: Lube oil System
Issued By: Steve Willard P.Eng	Signature:
Name Engineering: Steve Willard P.Eng	Name Production:

Component Description:
LM2500 Lube Oil System

Part Number & S/N:
N/A

Reason for Engineering Production Permit:

1) Lube oil pressure is approximately 1 psi high compared to test limit.
2) C sump scavenge temperature is approximately 10°F high at 9400rpm compared to test limit.

Engineering reviewed TCT historical data which showed the sumps to all flow within the past recorded ranges. The C-sump oil nozzle was also removed, inspected for blockage and re-installed with no changes to flow noted after inspection and cleaning.

One piece of test equipment associated with the C-sump system was found to be cracked which may allow for hot gas to heat up the oil causing the excessive sump temperature.

Per the GEK 97310 (O&M manual), neither of the two discrepancies would put the engine in alarm when the OEM alarm set points are used (normal range for lube oil pressure being 20 - 60 psig and C-sump scavenge temp alarm 290° normal range expected to be 160-275°F).

After reviewing the engine build parameters no deficiency in build could be found. Since the engine is still within the normal expected OEM operating ranges for site conditions, TCT is recommending the engine be accepted.

References:
GEK 99418
GEK 97310

Revision	Date	Reason	Issued By
0	May 7, 2007	First Issue	S. Willard

APPENDIX F: RELEASE CERTIFICATE

TRANSCANADA TURBINES
The Independent Alternative

INSPECTION RELEASE CERTIFICATE (CERTIFICATE OF COMPLIANCE)

CUSTOMER NAME: Maui Electric	RELEASE CERTIFICATE NUMBER: 0758	
ENGINE TYPE: LM2500	MARK: PE	SERIAL #: 481-669
TOTAL HOURS SINCE NEW: 51,490	TOTAL HOURS SINCE LAST COMPLETE OVERHAUL:	N/A
CATEGORY: Overhaul	Cust. P.O. #: M31402	TCT Sales Order #: 06-2LM-060

REASON FOR RETURN:
Overhaul GT

MODIFICATIONS EMBODIED:
SB-085, SB-091, SB-160, SB-165, SB-174, SB-190.

MODIFICATIONS FOUND EMBODIED:
SB-045, SB-098, SB-102, SB-105, SB-109, SB-116, SB-117, SB-168.

TECHNICAL INSTRUCTIONS EMBODIED:
N/A

REPAIR INSTRUCTIONS EMBODIED:
N/A

STATEMENT OF WORK PERFORMED:
GT was overhauled IAW GEK 99418.
GG was tested and LPT spin test declined was by customer.

CERTIFIED THAT THE WHOLE OF THE MATERIAL AND/OR PARTS DETAILED HEREON HAVE BEEN REPAIRED, MODIFIED, TESTED AND INSPECTED AND UNLESS OTHERWISE STATED ABOVE, CONFORM TO THE FULL REQUIREMENTS OF THE APPROPIATE DRAWINGS AND/OR SPECIFICATIONS RELATIVE THERETO AND TO THE AGREED REQUIREMENTS OF THE CONTRACT OR PURCHASE ORDER

DATE: 14-MAY-07 PROJECT MANAGER: [signature]

DATE: 14-MAY-07 QUALITY REPRESENTATIVE: [signature]

CA-IR-333

Ref: MECO Response to CA-IR-103, Page 6 (M14 Generator Cleaning & Inspection).

Please provide the following:

a. Service and materials to perform the M14 Generator Cleaning/Inspection in 2007 are estimated at $161,615. Please provide complete copies of all supporting studies, vendor bids, analyses, workpapers and other documents supportive of this value.

b. State and describe the estimated dates and scope of work associated with this 2007 M14 generator work and explain steps taken by MECO to plan and manage this work.

c. Provide copies of outage reports and other documents associated with your response to part (b) of this information request, including any updated cost estimates for same.

d. If work has commenced on the M14 generator inspection/cleaning project, provide actual monthly charges incurred to date and anticipated to completion in connection with each project.

e. Explain and reconcile the costs for this work to the budgeted periodic overhaul work considered in MECO-WP-505.

f. Provide copies of contracts, invoices and other documents supportive of your response to part (d) of this information request, as available.

MECO Response:

a. The M14 generator inspection/cleaning was done in June and July 2007. To date, MECO has been billed $398,484.30 for the work (this amount does not include MECO labor). Estimates used to forecast the M14 generator inspection/cleaning are supplied in Exhibit 1.

b. The M14 generator was inspected and cleaned between June 4, 2007 and July 16, 2007 during the time the unit was down for its annual HRSG maintenance and a control system upgrade project. Since the unit was to down for its annual HRSG maintenance, the work for the generator inspection/cleaning and controls upgrade was scheduled at the same time to reduce the need to take another outage. Description of the inspection/cleaning report is supplied in Exhibit 2.

c. Inspection/cleaning of this generator was due to a generator oil seal leak. The oil seal was repaired in 2006 but the generator could not be cleaned at the time. A report on the oil leak

is supplied in Exhibit 3. The total cost for the M14 work was $410,493.85, as shown in Exhibit 4.

d. Monthly charges for the work done on M14 generator are supplied in Exhibit 4

e. Generator inspection and cleaning was not considered in the normalization of overhaul costs in MECO-WP-505.

f. Invoices from the vendor for the cleaning/inspection of the unit M14 generator are supplied in Exhibit 5.

National Mechanical Services Inc.

December 14, 2005
NMS 05-1611

Mr. John Mauri
Mr. Tony Cadacunga

Maui Electric Co, LTD.
P.O. Box 398
210 West Kamehameha Ave
Kahului, Maui, HI 96733-6898

Gentlemen.

Thank you for affording National Mechanical Services, the opportunity to provide you with a quote for the Brush Generator Overhaul at the Maalaea Cogeneration facility in Maalaea HI, in accordance with the attached work scope and schedule. In addition to the scope of work attached, a hand wipe and cleaning of the inside of the generator package will be completed. **This Quote is for the Month of June 2006 only.**

Subject. NMS will provide all transportation, labor and material for the in the field service procedure for the above listed Bursh generator. The as found conditions with photographs will be reported to your representative prior to reassembly. The reassembly of all systems disrupted by NMS and remains on site until released by your site personnel. NMS will work on site with (1) Project Manager, (1) Senior Field supervisor, (2) Field Supervisor and (8) Service Technicians. Working (2) *12 hour shift* over a 7 day period starting at 6:00 am.

Project Pricing: Fixed Price of **$ 132,126.00**

Less shipping of tools. See attached one way estimate.

Comments: Labor, Equipment, Transportation and subsistence for additional repairs or delays outside the projected work scope for which NMS is not responsible. Technical deficiencies or work stoppages are considered by NMS to be outside the basic work scope. All Field Trim Balance and or Alignments not contracted through or to NMS, that results in additional work or stand-by times shall be invoiced using the below listed rates. These rates will apply to all additional work outside of the basic work quoted above.

1640 B Hoover Avenue, National City, CA 91950
619-477-1991 phone, Fax 619-477-1994
info@natlmech.com

Standard Advertised Rates:

	Straight Time	Overtime Rate	
	(First 8 Hours	(After 8 Hours)	(After 12 Hours)
Project Manager	$ 80.00	$ 120.00	$ 160.00
Senior Field Supervisor	$ 80.00	$ 120.00	$ 160.00
Field Supervisor	$ 68.00	$ 102.00	$ 136.00
Field Technician	$ 62.00	$ 93.00	$ 124.00
Per Diem per Man Day	$ 275.00		
Misc. Expense		+ 10% supported by receipts	
Shipping of Tooling by sea container		+ 10% supported by receipts	

Miscellaneous Expense: Are described as minor parts or supplies that are unforeseen and must be replaced on the job when identified by contractor. All expenses over the projected value of $ 50.00 will be approved in advance by the site representative. Miscellaneous expense shall be invoiced at cost +10% supported by receipts.

Terms: NMS requires a 35% deposit upon acceptance of your purchase order NMS will invoice an additional 35% at the 50% completion mark as defined as when the rotor is ready to be re-installed and the remainder of the 30% balance upon completion of all work. All invoices shall be at NET 30 Days..

Purchase Order: Is required not later than 45 Days prior to the start date. This will reduce your final cost as it relates to shipping requirements to ensure tooling arrives on time and the purchase of lower available air fair.

In the event the advance purchase order is not received NMS reserves the right to invoice the increased cost in purchasing of air travel and shipment of tooling.

Site to provide: Current copy of unit technical manual, 10 wooden pallets for staging the removed generator components, lay down and parts cleaning area, one (1) 6000 lbs grade all type fork lift.

Schedule Start Date: All work will start at 6:00 am the dates as mutually agreed upon by the customer and NMS.

NMS performs Maintenance and Repair Services to many other types of Equipment. Should the need arise, NMS will be glad to provide assistance.

Additional Comments and Requirements:
Facility to identify any special training other than site specific safety training to be held the morning of the 1st work day prior to NMS acceptance of P.O. or contract. NMS will forward the final written report within 20 days of job completion.

On behalf of NMS I look forward to continuing a long and equitable relationship with you and the fine staff of Maui Electric Company.

Sincerely

William da Silva, NMS

1640 B Hoover Avenue, National City, CA 91950
619-477-1991 phone, Fax 619-477-1994
info@natlmech.com

National Mechanical Services

MAJOR OVERHAUL GAS AND STEAM TURBINE GENERATOR PROCEDURES

Arrival on Site

1.1. Introduction to site personnel and obtain site access.
1.2. Complete safety/induction course.

2. *Scope of Work*

2.1. Clearly define scope of work with customer.
2.2. Agree to working hours.

3. *Safety System*

3.1. Establish safe working system.
3.2. Make safe work area.
3.3. Use all appropriate safety equipment.
3.4. Sign on all permits as required.
3.5. Ensure all tags are hung.

4. *Clean Area*

4.1. Establish a clean area appropriate to the scope of work.
4.2. Set up storage area for tools required for the job.
4.3. Allocate an area for storage of parts removed from the machine.

5. *Isolation*

5.1. Turbine starter.
5.2. Turbine fuel.
5.3. Turning gear.
5.4. Main generator breaker.
5.5. Generator space heaters.
5.6. Bentley Nevada proximeters.
5.7. Exciter field.

6. *Disconnections*

6.1. Main terminals and lineside box.
6.2. Neutral (star) point and box.
6.3. Earthing (ground) straps.
6.4. Space heaters.
6.5. Bentley Nevada proximeters.
6.6. Record gap voltages.
6.7. Exciter/PMG connections.

1640 B Hoover Avenue, National City, CA 91950
619-477-1991 phone, Fax 619-477-1994
info@natlmech.com

7. ***IR Checks***

7.1. Main stator.
7.2. Main rotor.
7.3. Exciter field.
7.4. Exciter armature.
7.5. PMG stator.

8. ***Access***

8.1. Remove side covers.
8.2. Remove exciter air ducting.
8.3. Measure exciter fan tip clearance.
8.4. Measure exciter air gap.
8.5. Remove exciter end covers.
8.6. Measure NDE main fan gap.
8.7. Remove fan shrouds NDE.
8.8. Remove compartment walls NDE.
8.9. Remove PMG stator.
8.10. Remove exciter stator.
8.11. Measure DE main fan gap.
8.12. Remove fan shrouds DE.
8.13. Remove Compartment walls DE.

9. ***Bearing Removal***

9.1. Remove all connections and dust covers.
9.2. Set up DE & NDE lifting gear.
9.2. Remove DE & NDE top half housing.
9.3. Measure bearing clearances.
9.4. Remove bearings.
9.5. Remove bottom half seals if required.
9.6. Remove bottom half end plates.
9.7. Check and measure all bearings & seals

10. ***Rotor Removal***

10.1. Prepare area for rotor placement.
10.2. Position cranes/forklifts.
10.3. Fix lifting points.
10.4. Insert blocks and skid plates.
10.5. Remove rotor.
10.6. Position rotor on blocks.
10.7. Weatherproof complete work area.

11. ***Visual Inspection***

11.1. Discoloration of windings.
11.2. Powder coating or tide marks'
11.3. Blackened areas or coils.(Greasing)
11.4. Distinctive smells.
11.5. Wet or dry deposits.

11.6. Chips, cracks or scrapes to the insulation.
11.7. Integrity of winding blocks.
11.8. Integrity of slot wedges.
11.9. Mechanical deposits in the air gap.
11.10. Rotor cooling slots clear.

12. ***Clean***

12.1. Stator end windings.
12.2. Stator core.
12.3. Cooler.
12.4. Complete stator.
12.5. Exciter.
12.6. PMG.
12.7. Complete rotor.
12.8. Bearings.
12.9. Seals.
12.10. 4 Upper end quadrants
12.11. Exciter air duct
12.12. Exciter cover
12.13. PMG cover
12.14. 2 lower half end plates with bearing sumps
12.15. 8 Aluminum fan compartment covers
12.16. 4 Main fan shrouds
12.17. 2 top half bearing housings
12.18. 2 Air inlet grills
12.19. Line side terminal box
12.20. Neutral terminal box
12.21. 8 Space heaters
12.22. Tap all cover screw holes

13. ***Rebuild***

13.1. Lift rotor.
13.2. Refit blocks and skids.
13.3. Rethread rotor,
13.4. Refit bottom half endplates.
13.5. Check end frame levels.
13.6. Refit bearings.
13.7. Check & Set air gaps.
13.8. Check & Set bearing clearances.
13.9. Replace seal housing gaskets
13.10. Refit seal housings
13.11. Refit bearing housings.
13.12. Check & Set seal clearances.
13.13 Refit fan compartment walls and shrouds.
13.14 Ensure locking tabs are fitted correctly.
13.15 Measure fan tip clearances and record.
13.16 Refit to half end covers.
13.17 Refit exciter and PMG
13.18 Check exciter and PMG air gaps.
13.19 Refit exciter air ducting.

14. ***IR Checks***

    14.1. Main stator.
    14.2. Main rotor.
    14.3. Exciter field.
    14.4. Exciter armature.
    14.5. PMG stator.

15. ***Clean Area***

    15.1. Clean all surfaces of generator.
    15.2. Remove all rubbish from around the unit.
    15.3. Dispose of all waste either on site or return to depot.
    15.4. Check all tools are returned.

16. ***Reconnections***

    16.1. Main terminals and line side box.
    16.2. Neutral (star) point and box.
    16.3. Earthing (ground) straps.
    16.4. Space heaters.
    16.5. Bentley Nevada proximeters.
    16.6. Set gap voltages.
    16.7. Exciter/PMG connections.

17. ***Startup***

    17.1. Verify oil pressure and flow
    17.2. Ensure generator turns smoothly.
    17.3. Ensure no scraping noises.
    17.4. Monitor vibrations.
    17.5. Monitor temperatures.
    17.6. Record running conditions.

18. ***Departing Site***

    18.1. Ensure all permits are signed off
    18.2. Ensure all tags are removed.
    18.3. Sign all paperwork.
    18.4. Inform site of departure.

01#:12 Pit *EST* 11/15/:5 *ALL STATES* Page 1

ATTN: CHRISTINE DESILVA - AlP

+----------+
:aUOTE:
+----------+

ALLSTATES AIR CARGO, INC. - SAN
9265 DOWDY DRIVE
SAN DIEGO CA 92126
Tel: (858) 586-9666 Fa) (: (310) 978-6331

QUOTE ': QA151607
REF: SAN0511151607
DATE: *11/15/05*

Quoted By: sans an

SHIPPER
NATIONAL MECHANICAL SERVICE
CHRISTINE DESILVA - AlP TEL:
(619) 477-1991
FAX: (619) 477-1994

TOTAL WEIGHT : 36000 L PCS: 1
PREPAI *DI*COL LECT:
SERVICE LEVEL : OTHER
DECLARED VALUE :
INSURED VALUE

FROM LOCATION: NATIONAL CITY CA 91950 LAX LOS ANGELES, CA

TO LOCATI ON MAUl HI OGG MAUl, HAWAI I

PIECES L H PIECES L H PIECES L H

PIECES	ACTUAL -LBS.	- KILOS	DIM WGT	CHARGABLE WGT		AIR FRT RATE PER UNIT (KG or 100 LBS)
1	36000	16330		36000	(L I	

Weight Charge 4400. 00

TOTAL aUOTED AMOUNT: 4400. 00

ADDITIONAL NOTES FOR THIS QUOTE
oce~n rate buis to buis 10-15 days.

---------- IMPORTANT NOTES ON THIS QUOTE ----------

RATE QUOTES ARE SUBJECT TO CHANGE DUE TO REWEIGHT AND DIMENSIONAL WEIGHT RATE
QUOTE' MUST APPEAR ON AIRWAY BILL OR B/L FOR aUOTE TO BE VALID
RATE aUOTES ARE EFFECTIVE FOR 30 DAYS ONLY - UNLESS OTHER ARRANGEMENTS ARE MADE
••• DOMESTIC DIM FACTOR=194, INTERNATIONAL DIM FACTOR=166 •••

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AGTSERVICES
24 Sam Stratton Road
Amsterdam, NY 12010
(518) 843-1112 phone
(518) 843-8389 fax
www.agtservices.com

QUOTATION

DATE: March 13, 2007
QUOTATION NO: 086-2007

Client:
Mr. Gerardo Flores
Maui Electric, Co.

E-mail: gflores@mauielectric.com
Phone: 808-442-4905
Fax:

RFQ #
Electrical Testing on M14 – Brush 29566 KVA Generator

ITEM #	ITEM	DESCRIPTION	TOTAL (US $$)

ITEM #	ITEM	DESCRIPTION	TOTAL (US $$)
1	D-C Test & Inspection	Standard D-C test and inspection of the primary generator, consisting of the following: Electrical Testing - Stator: ▪ Winding copper resistance, of each phase. ▪ Insulation Resistance and PI, of each phase. ▪ D-C leakage, of each phase. ▪ One minute hipot, of each phase. ▪ Resistance check and one minute megger of all RTDs. Electrical Testing – Field: ▪ Winding copper resistance. ▪ Insulation Resistance and PI. ▪ AC Impedance Test. Visual Inspection - Stator: ▪ Indications of loose wedges (wedge map). ▪ Indications of mechanical damage, looseness, or overheating of core iron. ▪ Visual inspection of stator bars for indications of looseness or vibration. ▪ Indications of any space block movements. ▪ Indications of loose blocking, ties, supports, or bolting hardware. Visual Inspection - Field: ▪ Indications of collector ring wear (if equipped). ▪ Indications of journal wear. ▪ Indications of mechanical damage, arcing, looseness, or overheating of wedges, forging, fan rings and retaining rings. ▪ Visual inspection (as accessible) of field windings for indications of distortion or blocking or insulation movement. *Duration: 2-10 hour shifts*	
1A	Single Shift Staffing	Perform work scope utilizing one Generator Specialist, assisted by helper provided by others. *Duration: 4 shifts, working 1-10 hour shift per day X 7 days per week*	T&M Estimated to be $ 25,755.00. See Attached Worksheet
1B	Double Shift Staffing	Perform work scope utilizing two Generator Specialists, assisted by helpers provided by others. *Duration: 4 shifts, working 2-10 hour shifts per day X 7 days per week*	T&M Estimated to be $ 33,660.00. See Attached Worksheet

ITEM #	ITEM	DESCRIPTION	TOTAL (US $$)
		Please note: ▪ *A draft copy will be reviewed with and provided to customer prior to leaving site. A formal color report, with photos if applicable of areas of concern, will be submitted within 30 days of job completion.* ▪ *Depending upon the operating condition and age of the unit, we may be required to clean the stator prior to conducting any high voltage testing. As we don't know if this cleaning will be required, we have NOT included in the above test pricing, but rather will be performed on a T&M basis.*	
2	Rotating Brushless Exciter Testing	Standard D-C test and inspection of the rotating exciter, consisting of the following: PMG Testing: ▪ Visual Inspection ▪ 500VDC Megger and PI ▪ DC Winding Resistance Stationary Pole Testing: ▪ Visual Inspection ▪ 500VDC Megger and PI ▪ Winding Resistance ▪ AC Impedance Test ▪ AC Pole Drop Test Rotating Armature Testing: ▪ Visual Inspection ▪ 500VDC Megger and PI Diode Wheel Testing: ▪ Fuses - removed, cleaned, and DC resistance Check ▪ Diodes – DC Resistance Check ▪ If equipped with resistors or Capacitors - DC Resistance Check ▪ If heat sinks have insulators beneath them – 500VDC megger *Duration: 1 shift, included in duration for 1A or 1B*	Included in above T&M Estimate price
3	ELCID Test	Tests core and step interlaminar insulation; proves there is not a shorted core iron condition that might cause in-service heating. *Duration: ½ shift, included in duration for 1A or 1B*	Included in above T&M Estimate price
		NOTE: Any repairs needed as a result of any testing and inspection will be billed at either Time & Material rates (rate sheet attached) or a mutually agreed upon firm price offer. Emergency support for testing and/or repairs is available from our Amsterdam, NY offices within twelve (12) hours notification.	

Please call if you have questions!

Weekend hours phone: (518) 441-9515 - Mike Bresney, (518) 368-7305 - Jim Taillon, or (518) 365-8353 - Vinny Rigosu

AGTSERVICES

(518) 843-1112

Signature: *William R. Dollard, Jr.*

William R. Dollard, Jr.
Contract Manager

Enclosure

Taxes, permits, or license fees EXCLUDED
2007 AGTS Rate Sheet attached.
Terms and conditions attached.
Insurance certificate forwarded upon request.

AGTSERVICES

(518) 843-1112

DIVISION OF RESPONSIBILITIES

(unless otherwise addressed in Specification)

	AGT*Services*	Owner
Unloading, locating, and reloading contractor's equipment		X
Scaffolding		X
Welding Gases (propane & oxygen)		X
Heat lamps/heaters for equipment protection		X
Phone services (fax machine)		X
Office facilities (copier)		X
Sanitary Facilities (sink and toilet)		X
Protective covers for turbine deck, electrical equipment, etc. (outdoor units)		X
Trash receptacles and disposal		X
Electricians for all specialty electrical work		X
Designated hazardous material (flammable liquid) storage		X
D-C Test & Inspection Programs Only:		
Electric Power (110V)		X
NDT services (retaining rings, journals, etc.)		X
Dry generator (produce acceptable megger readings prior to mobilization)		X
Disconnect (prior to testing) and reconnect (upon completion of testing) generator links and neutral grounding transformer connections		X
Disconnect/ground RTDs		X
Open bushing box; ventilate; test for acceptable O_2 levels		X
Test & remove all materials designated as hazardous by EPA and/or OSHA (asbestos & lead)	**T&M**	
Clean stator core/end windings (if contaminated) to allow safe high voltage testing environment	**T&M**	

PLEASE NOTE: Standard customer site support is also an essential part of any generator maintenance contract. The published support requirements are developed over time and with the understanding that certain utilities and/or mechanical support has to be in place and available to do the work in the manner it should be conducted. Sometimes just having adequate protection against weather or climate factors is necessary to assure that sensitive equipment or the health and safety of personnel are assured, which in turn assures that the work is processed and completed in a satisfactory manner. All support items listed are important and deemed equally necessary to perform the work according to schedule and contract terms. Any failure to support, as applicable to the location, site and/or environment may have an adverse impact to schedule and if the schedule is compromised due to lack of adequate support from the site or customer, AGT Services may seek to recover lost revenues that result.

AGTSERVICES Inc.

2007 United States Rate Schedule

(revised 2-9-07)

Classification	Hourly Labor Rate	
	Straight Time	Over Time
Shop Preparation – tool packing; site deliveries	50.00	75.00
Generator Winder	105.00	157.50
Generator Lead Winder	130.00	195.00
Generator Specialist	180.00	270.00
Engineering Consultant/Technical Director	220.00	330.00

Travel time = 8 hours each way (continental US); actual hours (Hawaii, Alaska)
Straight time = Monday – Friday (excluding holidays), first 8 hours
Over time = Saturday – Sunday, all hours; Monday – Friday, all hours in excess of 8; and six company holidays (New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day)
Stand-by time (weekday) = Maximum 8 hours/day @ Straight time rate, + expenses
Stand-by time (weekend) = expenses only

Travel and living (T&L) expenses are billed at cost + 10%, with a $150/man/day minimum charge. T&L may include, but is not limited to, the following charges – (1) Airfare, including excess baggage fees, change fees, and airline surcharges, if any; (2) Vehicle mileage, currently at $0.485 per mile for employee vehicles and $1.00 for company vehicles; (3) Airport parking; (4) Taxi fees to/from airport; (5) Rental car; (6) Per diem, currently $40/day, with the exception of New York City, Los Angeles, and Washington, DC and all Alaska and Hawaii at $50/day; (7) Miscellaneous expensed site purchases

Miscellaneous Charges	Mark-up
Tooling/test equipment rental	D-C test set - $600/week ELCID - $350/test Stator repair tooling - $600/wk Field repair tooling - $600/wk Other repair tooling prices on request
Third party equipment rental (induction heater, power rollers, specialized test equipment)	Cost + 15%
Freight/Subcontractors	Cost + 15%
Consumables/Disposables	Cost + 20%
Materials – short-shelf/stock *Materials – custom-order/reverse-engineered*	Cost + 20% Cost + 30% + engineering time, as applicable

Payment Terms- Net 30 Days

AGTServices Inc.
24 Sam Stratton Road
Amsterdam, NY 12010

(518) 843-8389 facsimile

AGTSERVICES

(518) 843-1112

STANDARD TERMS AND CONDITIONS

Payment Terms
Unless specified otherwise in this contract, payment terms are 30 day net from the issue date of the invoice. For accounts 30 days past due, an annual rate of 18% interest charge will be levied and billed on a monthly basis.

Taxes and Duties
Company's prices do not include sales, use, excise, value added or similar taxes. Consequently, in addition to the price specified herein, the amount of any present or future sales, use, excise, value added or other tax applicable to the sale or use of the equipment hereunder shall be paid by Purchaser, or in lieu thereof, Purchaser shall provide Company with a tax exemption certificate acceptable to the taxing authorities. Any taxes (including income, stamp and turnover taxes), duties, fees, charges or assessments of any nature levied by any governmental authority other than of the U.S. in connection with this transaction, whether levied against Purchaser, against Company or its employees, or against any of Company's subcontractors or their employees, or otherwise, at any tier, shall be for Purchaser's account and shall be paid directly by Purchaser to the governmental authority concerned. If Company is required by law or otherwise to pay any such levy and/or fines, penalties, or assessments in the first instance or as a result of Purchaser's failure to comply with any applicable laws or regulations governing the payment of such levies by Purchaser, the amount of any payments so made by Company shall be reimbursed by Purchaser to Company upon submission of Company's invoices. All rights to drawback of customs duties for the equipment (or material therein) belong to and shall remain in Company. Purchaser agrees to cooperate with Company and to furnish such documents to Company as may be necessary to obtain drawback.

Governmental Authorizations
Purchaser shall be responsible for the timely obtaining of any required authorization, such as an Export License, Import License, Exchange Permit or Planning Permission, Operating License, or any other governmental authorization, even though any such authorization may be applied for by Company. Company shall not be liable in any authorization is delayed, denied, revoked, restricted or not renewed and Purchaser shall not be relieved thereby of its obligations to pay Company for its work. All sales hereunder shall at all times be subject to the export control laws and regulations of the US Government and any amendments thereof. Purchaser agrees that it shall not make any disposition, by way of transshipment, re-export, diversion or otherwise, except as said laws and regulations may expressly permit, of US origin goods purchased from Company, other than in and to the ultimate country of destination specified on Purchaser's order and/or declared as the country of ultimate destination on Company's invoices.

Warranty
AGT Services Inc. (Company) warrants that services will be performed in a competent manner. Industry accepted suitability for service criteria will apply. If the purchaser notifies Company in writing of dissatisfaction, Company will replace the assigned specialist or manager in a timely manner. In the event it is determined that the services were improperly performed, Company will re-perform that portion of services at no charge. Company warrants to Purchaser that equipment to be delivered and work to be performed will be free from defects in material or workmanship. If the equipment delivered hereunder or the work carried out does not meet the above warranties, Purchaser shall promptly notify Company and make the equipment available promptly for correction. Company shall thereupon correct any nonconformance or defect in materials or workmanship by, at its option, either repairing any defective parts of the equipment, or by making available at Company's plant necessary repaired or replacement parts. Where a failure cannot be corrected by Company's reasonable efforts, the parties will negotiate an equitable agreement.

Company does not warrant the equipment or work against normal wear and tear due to operation or environment. Further, Company does not warrant any equipment of others design where such equipment is not normally supplied by Company. The foregoing warranties (except as to title) for each unit shall apply for a period of twelve (12) months from the date of completion of repairs. The foregoing warranties as exclusive and in lieu of all other warranties, whether written, oral, implied or statutory (except as to title). NO IMPLIED STATUTORY WARRANTY OR MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. The foregoing shall constitute the exclusive remedies of Purchaser for claims (except as to title) based on defect in or failure of products or services, whether the claims are in tort (including negligence), strict liability or otherwise, whether arising before or after delivery, and however instituted. Upon expiration of the warranty period, all such liability shall terminate. Company makes no warranty, express or implied, to any other person or entity concerning the services performed hereunder, and Purchaser shall defend and indemnify Company from any claims made under any warranty or representation by Purchaser to any third party.

Force Majeure
No failure or omission to carry out or observe any of the terms, provisions or conditions of this Contract shall give rise to any claim by Purchaser against the Company or be deemed to be breach of this Contract if the same shall be caused by or arises out of any act beyond the control of Company, including but not limited to:

(a) any war, declared or not or hostilities, or of belligerence, blockades, revolution, insurrection, riot, public disorder, expropriation, requisition, confiscation or nationalization, export or import restrictions by any governmental authorities, closing of harbors, docks, canals, or other assistance's to or adjuncts of the shipping or navigation's of or within any place, rationing or allocation, whether imposed by law, decree or regulation by, or by compliance of industry at the insistence of any governmental authority, or fire, unusual flood, earthquake, storm, lightning, tide (other than normal tides), tidal wave, perils of the sea, accidents of navigation or breakdown or injury of vessels, accidents to harbors, docks, canals, or other assistance's to or adjuncts of the shipping or navigation, epidemic, quarantine, strikes or combination or workmen, lookouts or other labor disturbances, or any other event, matter or thing, wherever occurring, which shall not be within the reasonable control of Company.

(b) In the event of such a delay, the dates for delivery and completion shall be extended for a period equal to the time lost by reason of delay.

(c) If the company is delayed by the actions or failure to act of the Purchaser, its subcontractors or assigns, then the dates of shipment and completion shall be extended by a period equal to the time lost by reason of delay. Furthermore, the Purchaser shall reimburse the Company for all extra costs incurred by Company as a result of that delay.

Limitation of Liability
COMPANY'S LIABILITY, FOR ANY CLAIM OF ANY KIND (EXCLUDING BODILY INJURY), WHETHER BASED ON CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE, FOR ANY LOSS OR DAMAGE ARISING OUT OF, CONNECTED WITH, OR RESULTING FROM THIS CONTRACT SHALL IN NO CASE EXCEED THE CONTRACT PRICE FOR THE SERVICES WHICH GIVES RISE TO THIS CLAIM AND IN ANY EVENT SHALL TERMINATE ONE YEAR AFTER COMPLETION OF SERVICES.

COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF PROFITS OR REVENUE, OR COST OF SUBSTITUTES. IF THIS IS A SUBCONTRACT PURCHASER MUST OBTAIN A PROVISION FROM

HIS PURCHASER PROVIDING THE COMPANY AND ITS SUPPLIERS THE PROTECTION OF THIS ARTICLE. This Limitation of Liability prevails over any conflicting provisions of this contract.

Liability and Indemnity
Company shall not be liable for injuries suffered by Purchaser, its employees, agents, representatives or assigns incurred while performing work, delivering equipment, material or supplies, or performing or carrying out any other work or services in connection with this contract. Purchaser shall hold Company harmless from any and all claims, causes or action, injuries or damages incurred by or to its employees, agents, representatives or other individuals not employees of the Company arising from the performance of this contract, unless the claims, causes or actions injuries or damages are caused by the sole negligence of, or gross misconduct of Company, its agents, representatives or assigns.

Proprietary Information
Purchaser agrees to consider as confidential all information, data and material disclosed by Company to Purchaser in connection with this contract. Purchaser agrees to take all reasonable precautions to prevent disclosure of such information, data and material to third parties and to use such information, data and materials only for the limited purpose of this contract and for no other purpose. These obligations of confidentiality provided hereunder shall survive termination of this contract. Notwithstanding any other provision hereof, all proprietary rights (including but not limited to patent rights and trade secrets) in and to the information supplied by Company shall remain the property of Company.

The preceding obligations of the Purchaser of nondisclosure and the limitation upon the right to use the information shall not apply to the extent that Purchaser can demonstrate that the information is:

(a) In the possession or control of Purchaser prior to the time of disclosure hereunder; or
(b) At the time of disclosure or thereafter becomes public knowledge through no fault or omission of Purchaser; or
(c) Lawfully obtained by the Purchaser from a third party under no obligation of confidentiality to Company.

Price Adjustments
In case a change in the contract specification results in a change in price, all installments shall be adjusted accordingly. However, if the change results in a decrease in price, then the payments previously made shall be retained by Company and applied to subsequent payments as they become due. In the event of a cancellation or termination of this contract, if the amount theretofore paid exceed the cancellation charges, the excess shall be refunded to the Purchaser. If deliveries are delayed by Purchaser and Company agrees to a revised delivery schedule, due dates of payments shall be based on the revised delivery schedule. Payments already made shall be retained by Company and applied to payments as they become due. Suspension If either party to this contract decides to suspend work under this contract, that party shall give the other one week advanced, written notice of the suspension date. Purchaser will be responsible for any and all costs incurred prior to the suspension date.

Cancellation
Shipping dates are approximate and are based upon prompt receipt of the equipment and/or materials and all necessary information. The Purchaser may cancel this contract only upon written notice and upon payment to the Company of reasonable and proper cancellation charges.

Non-Fulfillment
The due fulfillment by Purchaser of all the conditions set forth above, including the issuance of acceptable, irrevocable letters of credit and the making of payments there under as prescribed within the times specified hereunder are the essence of this contract and the failure to fulfill any such conditions shall constitute a breach of contract by Purchaser. Should Purchaser fail to fulfill any of the conditions of this clause, Company may suspend work or performance under the contract and any cost incurred by Company is accordance with such suspension shall be added to the contract price. In the event that Purchaser does not correct such failure in the manner and time satisfactory to Company, then Company may, at its option, terminate the contract with respect to the portion of equipment not delivered and work not yet performed and Company's termination charges shall be paid by Purchaser to Company upon presentation by Company of its invoices including under the letter of credit to the extent funds are available. Performance of Company's obligations shall be extended for a period equaling the period of Purchaser's non-fulfillment of any portion of the payment terms, whether or not Company suspends performance.

Non-Waiver of Breach
Either party hereto may specifically waive any breach of this Contract by the other party, provided that no such waiver shall be binding or effective unless in writing and no such waiver shall constitute a continuing waiver of similar or other breaches. A waiving party, at any time and upon notice given in writing to the breaching party, may direct future compliance with the waived term or terms of this Contract, in which event the breaching party shall comply as directed from such time forward.

Notices
Each party shall provide the other party with a telephone number to be used for routine and emergency operational notifications. For routine notifications, any such telephonic notification shall be followed up with written notification as outlined below.
All notices and other communications from either party to the other hereunder shall be in writing and shall be deemed received when actually received if personally delivered, upon acknowledgment of receipt if sent by facsimile, or upon the expiration of the third business day after being deposited in the United States mails, postage prepaid, certified or registered, addressed to the other party.

Severability
Nothing contained in this Contract shall be construed so as to require the commission of any act contrary to any law, and wherever there is any conflict between any provision of this Contract and any law, such law shall prevail; provided, however, that in such event the provisions of this Contract so affected shall be curtailed and limited only to the extent necessary to permit compliance with the minimum legal requirement, and no other provisions of this Contract shall be affected thereby, and all such other provisions shall continue in full force and effect.

Successors
This Contract shall be binding on and shall inure to the benefit of any and all successors of the parties.

Rules of Construction and Headings
Any ambiguities shall be resolved without reference to which party may have drafted this Contract. The description headings of the several sections and paragraphs of this Contract are inserted for convenience only and do not constitute a part of this Contract.

Entire Agreement and Amendment
This Contract constitutes the entire agreement between the parties, and supersedes all previous understandings, commitments or representations concerning the subject matter. This Contract may not be amended or modified in any way, and none of its provisions may be waived, except by a writing signed by an authorized officer of the party against whom the amendment, modification or waiver is sought to be enforced. The parties each acknowledge that the other party has not made any representations other than those which are contained herein.

Details: Test and Inspection of EM Generator
Furnish TWO GS to work 2-10 hour shifts per day
Total duration expected to be 4 shifts

	Class	Rate	Mark Up	Monday 4-Jun ST	Tuesday 5-Jun ST	Wednesday 6-Jun ST	Thursday 7-Jun ST	Friday 8-Jun ST	Saturday 9-Jun ST	Sunday 10-Jun ST	Subtotal
	Consultant	$ 220.00									$ -
	Specialist	$ 180.00			36						$ 6,480.00
	Lead Winder	$ 130.00									$ -
	Winder	$ 105.00									$ -
	Shop Prep	$ 50.00									$ -
	Airfare	$ 1,200.00	10%		2						$ 2,640.00
Travel (IN)	Expenses + 10%	$ 250.00	10%		2						$ 550.00

	Class	Hourly ST Rate	Mark Up	Monday 4-Jun ST	Monday 4-Jun OT	Tuesday 5-Jun ST	Tuesday 5-Jun OT	Wednesday 6-Jun ST	Wednesday 6-Jun OT	Thursday 7-Jun ST	Thursday 7-Jun OT	Friday 8-Jun ST	Friday 8-Jun OT	Saturday 9-Jun ST	Saturday 9-Jun OT	Sunday 10-Jun ST	Sunday 10-Jun OT	Subtotal
	Consultant	$ 220.00																$ -
	Specialist	$ 180.00						16	4	16	4							$ 7,920.00
	Lead Winder	$ 130.00																$ -
	Winder	$ 105.00																$ -
On Site	Shop Prep	$ 50.00																$ -
Labor	Expenses + 10%	$ 250.00	10%					2		2								$ 1,100.00

	Class	Rate	Mark Up	Monday 4-Jun ST	Tuesday 5-Jun ST	Wednesday 6-Jun ST	Thursday 7-Jun ST	Friday 8-Jun ST	Saturday 9-Jun ST	Sunday 10-Jun ST	Subtotal
	Consultant	$ 220.00									$ -
	Specialist	$ 180.00							18	18	$ 6,480.00
	Lead Winder	$ 130.00									$ -
	Winder	$ 105.00									$ -
	Shop Prep	$ 50.00									$ -
Travel	Airfare	$ 1,000.00	10%								$ -
(OUT)	Expenses + 10%	$ 250.00	10%						2	2	$ 1,100.00

	Category	Rate	Mark-up	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Subtotal
	Freight		15%	$ 2,800.00						$ 2,800.00	$ 6,440.00
	Subcontractor		15%								$ -
	Consumables		20%								$ -
	Equipment Rental		20%								$ -
	Test Box Rental	$ 600.00		$ 600.00							$ 600.00
	ELCID Rental	$ 350.00		$ 350.00							$ 350.00
	Field Repair Tool Rental	$ 600.00									$ -
	Stator Repair Tool Rental	$ 600.00									$ -
	Materials - Stock		20%								$ -
Misc	Materials - Custom		30%								$ -

TOTAL T&M ESTIMATE - SINGLE SHIFT $ 33,660.00

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Details: Test and Inspection of EM Generator
Furnish one GS to work 1-10 hour shift per day
Total duration expected to be 4 shifts

	Class	Rate	Mark Up	Monday 4-Jun ST	Tuesday 5-Jun ST	Wednesday 6-Jun ST	Thursday 7-Jun ST	Friday 8-Jun ST	Saturday 9-Jun ST	Sunday 10-Jun ST	Subtotal
	Consultant	$ 220.00									$ -
	Specialist	$ 180.00			18						$ 3,240.00
	Lead Winder	$ 130.00									$ -
	Winder	$ 105.00									$ -
	Shop Prep	$ 50.00									$ -
	Airfare	$ 1,200.00	10%		1						$ 1,320.00
Travel (IN)	Expenses + 10%	$ 250.00	10%		1						$ 275.00

	Class	Hourly ST Rate	Mark Up	Monday 4-Jun ST	Monday 4-Jun OT	Tuesday 5-Jun ST	Tuesday 5-Jun OT	Wednesday 6-Jun ST	Wednesday 6-Jun OT	Thursday 7-Jun ST	Thursday 7-Jun OT	Friday 8-Jun ST	Friday 8-Jun OT	Saturday 9-Jun ST	Saturday 9-Jun OT	Sunday 10-Jun ST	Sunday 10-Jun OT	Subtotal
	Consultant	$ 220.00																$ -
	Specialist	$ 180.00						8	2	8	2	8	2		10			$ 8,640.00
	Lead Winder	$ 130.00																$ -
	Winder	$ 105.00																$ -
On Site	Shop Prep	$ 50.00																$ -
Labor	Expenses + 10%	$ 250.00	10%					1		1		1		1				$ 1,100.00

	Class	Rate	Mark Up	Monday 11-Jun ST	Tuesday 12-Jun ST	Wednesday 13-Jun ST	Thursday 14-Jun ST	Friday 15-Jun ST	Saturday 16-Jun ST	Sunday 17-Jun ST	Subtotal
	Consultant	$ 220.00									$ -
	Specialist	$ 180.00		9	9						$ 3,240.00
	Lead Winder	$ 130.00									$ -
	Winder	$ 105.00									$ -
	Shop Prep	$ 50.00									$ -
Travel	Airfare	$ 1,000.00	10%								$ -
(OUT)	Expenses + 10%	$ 250.00	10%	1	1						$ 550.00

	Category	Rate	Mark-up	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Subtotal
	Freight		15%	$ 2,800.00						$ 2,800.00	$ 6,440.00
	Subcontractor		15%								$ -
	Consumables		20%								$ -
	Equipment Rental		20%								$ -
	Test Box Rental	$ 600.00		$ 600.00							$ 600.00
	ELCID Rental	$ 350.00		$ 350.00							$ 350.00
	Field Repair Tool Rental	$ 600.00									$ -
	Stator Repair Tool Rental	$ 600.00									$ -
	Materials - Stock		20%								$ -
Misc	Materials - Custom		30%								$ -

TOTAL T&M ESTIMATE - SINGLE SHIFT $ 25,755.00

WOOD GROUP GENERATOR SERVICES, INC

Corporate Office
1113 Camina Entrada - FARMINGTON, NM 87401
PHONE (505) 327-6363 - FAX (505) 325-7515

Quotation No: 0512-0375 Rev. 2

Date: **April 5, 2007**

To: Maui Electric **Attn:** Mr. Gerardo Flores
E-mail: gflores@mauielectric.com

SUBJECT: **Generator Assessment Program (GAP) option 3 Testing**

Dear: Mr. Flores,

Wood Group Generator Services is pleased to offer this proposal for your consideration. Over the past several years Wood Group has invested heavily in developing and expanding service capabilities for the energy sector and, specifically, over the past year Wood Group Generator Services has significantly grown its ability to serve both power and industrial customers.

WGGS is an ISO 9001:2000 certified company. We feel that this is a significant step in being the premier supplier of generator and motor services in the Americas.

This proposal covers mobilization of personnel, tools, equipment, and other supplies to the customer site located in Hawaii in order to perform our GAP Option 3 evaluation of a 30 MVA Turbine Generator. WGGS will send one Generator Specialist and one Generator Technician to perform the base scope of work listed below. It is anticipated that WGGS will maintain a presence at your site for four (4) days.

Base Scope: **$ 49,824.00**

If you have any questions please give John Taylor or myself a call.

Sincerely,

Chris Jones
Quote Coordinator/Cost Estimator
505 566 7013
505 860 2794 – cell
505 325-7515 – fax
chris.jones@woodgroup.com

An ISO 9001:2001 Certified Company

A Wood Group Company

1.0 Nameplate Data:

The following is the generator nameplate data:

Manufacturer:	Brush
kVA:	29,556
Voltage:	13,800
Phase:	3
Frequency-Cycle/Second:	60 Hz.
Operating Speed - RPM:	3,600

2.0 Assumptions and Clarifications:

2.1 It is assumed that no hazardous materials will be encountered in performing the work scope of this project. Abatement and disposal of any hazardous or regulated materials shall be the responsibility of the Customer.

2.2 It is assumed that the generator disassembly will be performed by others.

2.3 It is assumed that the disconnection and reconnection of the main and neutral leads will be performed by others.

2.4 No man hours have been allotted for generator cleaning, solvent or otherwise. Any cleaning desired by customer will be performed on a T&M basis.

2.5 It is assumed that any regulated waste produced by above cleaning will be turned over to the owner for proper disposal.

2.6 Pricing for options do not include any mobilization or travel time. It is assumed that WGGS will be notified of the customer's desire to purchase any options prior to mobilization of WGGS personnel.

2.7 Any standby time that results from the purchase of options after WGGS personnel have mobilized to site will be charged at a T&M basis.

2.8 Any time required for safety or in-processing training of WGGS personnel will be charged at a T&M basis.

2.9 Copies of previous test reports shall be available at the job site for the use and reference of WGGS.

2.10 As in all cases involving work on electrical equipment, WGGS personnel shall abide by the safety rules and procedures as specified by WGGS. Also, during the electrical testing, temporary barricades shall be used to prevent personnel form accidental or inadvertent exposure to an electrical hazard. WGGS shall provide the temporary barricades, unless the Customer prefers to use their own.

2.11 It is assumed that the customer will provide any scaffolding necessary to complete testing operations.

3.0 Standard WGGS Responsibilities:

3.1 Personal safety equipment.

3.2 Normal maintenance tools needed to perform the project work scope.

3.3 Expendable materials (i.e. rags, brushes etc.)

3.4 First aid supplies.

3.5 Material for protection of lay-down surfaces.

4.0 Standard Customer Responsibilities:

4.1 Safety orientation for the WGGS work force.

4.2 Special tooling and equipment, if required, originally supplied with the unit and alignment shims.

4.3 First aid facilities and fire protection.

4.4 Normal plant service required for maintenance such as light, heat, water, compressed air (90-110psi), and electric power (3 circuits-120v/20 amp; depending on work scope may require 240v/30 amp and 480v/100amp).

4.5 Sanitary facilities.

4.6 Lock out and tag out of the generator equipment and ground the stator.

4.7 Prepare generator for test (e.g. de-energized).

4.8 Disconnect and re-connect main and neutral leads.

4.9 Provide Electricians and Controls technician to assist WGGS generator specialists.
4.10 Crane(s) and operator or provide training for WGGS crane certification if applicable.
4.11 Representative scheduled concurrent with WGGS crews to facilitate location of parts and other outage activities.
4.12 Operational personnel to perform all normal functions for turbine-generator equipment (i.e. shutdown, start-up, drain and fill oil systems, etc.)
4.13 Designated work and lay-down areas accessible to crane and generator.
4.14 All permits, licenses, governmental or public utility charges and inspection fees.

5.0 Pricing and Payment:

5.1 The price of the services and materials as described in below work scope:

Price includes mobilization of Generator Specialist and all related expenses, as well as shipping of all required test equipment both to and from site:
NOTE: Pricing is based on two weeks prior notification. Prices are subject to change based on shorter notification.

Inspection and Testing on-site:	**$ 49,824.00**
Time required on-site:	**4 Days**

5.2 Anticipated turnaround is based upon our acknowledgement of your written purchase order and is subject to prior sales and commitments.

5.3 Payment terms will be as follows, subject to credit approval: Net 30 days

6.0 Unit Condition:

6.1 Turbine Generator is disassembled with rotor removed.
6.2 Main and Neutral leads are disconnected.

7.0 Work Scope Detail:

WGGS will furnish a Generator Specialist, and all required labor/craftsmen to conduct all work specified in this work scope. It is understood that mobilization of tools and materials can begin immediately upon the issuance of a purchase order.

7.1 Inspections/tests performed:

7.1.1 Visual inspection stator and rotor.
7.1.2 Bore scope inspection of rotor winding and blocking (as accessible).
7.1.3 Perform insulation tests on RTD's, stator winding, and rotor winding.
7.1.4 Winding resistance checks (stator winding and rotor winding).
7.1.5 Stator Winding Test – Polarization Index and Copper Resistance
7.1.6 Rotor Winding Test – Polarization Index, Copper Resistance, AC Impedance, Pole Drop.
7.1.7 Core tightness checks (visual inspection for "fretting," movement of core bolts, lamination looseness, or any other evidence of looseness).
7.1.8 Corona tests to determine areas and severity of any corona activity using corona camera.
7.1.9 Step voltage tests (DC step voltage / dielectric absorption with high potential) to determine insulation integrity of stator windings.
7.1.10 End winding inspection for evidence of looseness, corona, or damage.
7.1.11 Core El Cid test.
7.1.12 Wedge Tightness Detection using Adwel Electronic Wedge Tightness Detector.
7.1.13 Doble Power Factor.
7.1.14 NDE TGR Retaining Rings.

7.2 Exciter inspection:

7.2.1 Visual inspection.
7.2.2 Insulation resistance tests.

7.3 Benefits:

7.3.1 Reveals pending faults in winding of the rotor and armature.
7.3.2 Reveals deterioration of coil insulation caused by corona or end winding vibration.
7.3.3 Establishes a "base line" for evaluating future inspections and input for establishing. planned major maintenance activities.
7.3.4 Additional data on armature winding insulation integrity to more accurately access life and future maintenance requirements.
7.3.5 Assessment of "end winding" stability (resonance conditions can be immediately corrected to avoid premature winding deterioration.
7.3.6 Record of core tightness and stator lamination condition.
7.3.7 Electronic map of wedge tightness.
7.3.8 Provides a colored map of relative tightness of every wedge.
7.3.9 Data is stored for trend analysis for future maintenance planning.
7.3.10 Record of rotor retaining ring, wedges, and rotor body condition.

7.4 Final Report:

7.4.1 Standardized format provided electronically (CD or electronic mail).
7.4.2 Photographs of critical areas in the stator winding, core, and rotor.
7.4.3 Dielectric absorption graph and analysis of insulation integrity.
7.4.4 Summary of all insulation and winding resistance measurements taken.
7.4.5 Data sheets showing location and levels of corona activity.
7.4.6 Plots showing frequency distribution of end winding basket, if the optional End Winding Test is performed.
7.4.7 Core tightness record.
7.4.8 Any anomalies reported immediately with the Final Report submitted within 10 days of inspection.

8.0 Terms and Conditions:

8.1 APPLICABILITY

These Terms and Conditions of Sale shall be a part of and govern the Agreement entered into between Wood Group Generator Services, Inc. (herein WGGS) and Customer for the sale of goods and/or provision of services (collectively, "Service(s)"). WGGS rejects any modification, alteration, addition, or deletion made by Customer to any provision contained herein, and Customer's acceptance of WGGS's quotation, through any Customer order, acceptance, or direction, and WGGS's performance, is expressly limited to the terms set forth herein, unless the parties otherwise agree in writing. The parties acknowledge that Customer may issue a purchase order and/or WGGS may issue a confirming memorandum with respect to a project or contract. To the extent there is any inconsistency between any such document(s) and these terms and conditions, these terms and conditions shall control.

8.2 PRICE AND PAYMENT

The price is stated in net United States Dollars without any deductions whatsoever and is based upon current costs for materials, wages, freight, packing, insurance, taxes, subcontractor charges, and all other charges relating to the provision of Services. WGGS reserves the right to adjust the price in the event of any increase in costs or change in the scope of Services prior to the performance of the Service. Customer, in good faith and within thirty (30) days of invoice date, may dispute any item on an invoice and notify WGGS of the reasons for the dispute. WGGS and Customer shall promptly meet and resolve such dispute, with the disputed item immediately due for payment upon settlement. Payment of the undisputed portion of the price shall be made by Customer without setoff within thirty (30) days of the invoice date in such manner and to such account as stated in the invoice. Undisputed invoices or portions thereof that are past due shall bear a service charge of the lesser of one and one-half percent (11/2%) per month or the maximum rate permitted by applicable law until paid, as well as WGGS's costs of collection, including, without limitation, actual attorneys' fees.

8.3 WARRANTY

WGGS warrants the Services will be provided or performed with the skill and care commensurate with the recognized standards prevailing in the industry. WGGS makes no warranty regarding Customer or third party designed, manufactured, or supplied Services, but will assist Customer in securing the benefit of any warranties provided by such third parties. WGGS's warranty for each application or Service is as follows:

a. aero-derivative turbines or component repair – 5,000 operating hours or 6 months from date of shipment, whichever occurs first;
b. light industrial turbines or component repair –
c. heavy industrial turbines or component repair – 8,000 operating hours, 12 months from date of installation, or 18 months from date of shipment, whichever occurs first;
d. generator services – 12 months from date of installation or 18 months from date of shipment, whichever occurs first;
e. field services – 12 months from date of service; and
f. technical field assistance – 12 months from date of service.

If, within the warranty period stated above, Customer discovers the Services are not as warranted and promptly notifies WGGS in writing thereof, WGGS's liability and Customer's sole and exclusive remedy in any cause of action, whether in contract, tort, breach of warranty or otherwise, is expressly limited to the repair, replacement, re-performance, or an allowance to Customer of credit for the cost of such Services, at WGGS's sole option and expense. Customer shall assume all responsibility and expense for removal, reinstallation, and freight in connection with the foregoing remedies. The same warranty obligations and conditions as expressed herein shall apply to warranted Services repaired or replaced by WGGS. WGGS shall have the right of disposal of the part(s) and material(s) that it replaces. If Customer asserts a timely warranty claim, as provided herein, WGGS shall promptly evaluate the warranty claim and advise Customer within thirty (30) days whether WGGS contests the warranty claim. If the claim is not a valid warranty claim (to the reasonable satisfaction of WGGS), then all costs of the claim evaluation shall be the responsibility of the Customer. In the event Customer elects to engage a third-party or parties to correct the Service claimed to be nonconforming, prior to the expiration of said thirty (30) day period, WGGS is released from any warranty obligation.

This warranty is subject to the following conditions: (a) the Service was properly performed by qualified personnel (if not WGGS's employees); (b) the item was operated and maintained in accordance with applicable manufacturer's guidelines and standards, overhaul manuals, service bulletins and Customer handbooks; (c) the Service has been in use under normal operating conditions, has not been subjected to misuse, neglect or accident and has not subsequently been repaired or altered, except by WGGS; (d) where the item is to be stored for any period prior to installation, acceptance by WGGS of any warranty claim is conditional upon the item being stored in accordance with the manufacturer's recommended storage procedures and conditions laid down in the maintenance instructions prepared by the manufacturer; and (e) warranty claims shall only be considered by WGGS in respect of defects that become apparent and are notified by the Customer in writing to WGGS before the expiry of the warranty period.

IT IS EXPRESSLY AGREED THE FOREGOING WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES OF ANY KIND WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND CONSTITUTES THE ONLY WARRANTY OF WGGS WITH RESPECT TO THE SERVICES.

8.4 DELIVERY/DURATION SCHEDULES

Shipping and completion schedules are based on typical manufacturing cycles and anticipated conditions prevailing at the time of contract award and are premised upon prompt receipt of all information and approvals (if required) from Customer. WGGS will

make every reasonable effort to meet Customer schedules. Delivery, title, and risk of loss shall pass to Customer FCA (free carrier, Incoterms 2000), WGGS plant.

8.5 PERMITS AND TAXES
The Customer shall, at his own expense, secure any permits, tax exemption certificates, or any other authorization which may be required to permit WGGS to perform the requested Services. Any applicable duties or sales, use, excise, value-added or similar taxes will be in addition to the price and shown separately on each invoice, or in lieu thereof, the Customer may provide WGGS with an exemption or direct-pay certificate acceptable to the taxing authorities. Customer agrees to indemnify WGGS for any permits, licenses, taxes, fines or payments of any kind made by WGGS on behalf of Customer in fulfilling Customer's duties under this paragraph.

8.6 TITLE/RIGHT OF LIEN
Title to equipment repaired, modified, inspected, tested, or maintained under this Agreement shall remain with the Customer. WGGS shall have a lien upon all equipment in WGGS's possession upon which WGGS has undertaken work of any nature. In the event of nonpayment of any undisputed invoice, Customer shall be in default. WGGS's remedies for Customer's default shall include, but not be limited to, sale after notice.

8.7 INSPECTION
Within ten (10) business days of receipt by Customer of any delivery, Customer will inspect and perform any necessary testing and immediately notify WGGS of any claim that the Services are defective. Failure to timely notify WGGS in writing of any defects will constitute conclusive proof the Services delivered were accepted by Customer and received without defects. WGGS will not be responsible for any damage caused during shipment. It is the sole responsibility of Customer to file any appropriate claims with the carrier for reimbursement. WGGS will fully cooperate with Customer in making such claims. Customer may return any Service that is defective at the expense of WGGS within 20 days of delivery of such to Customer. WGGS will then replace such defective Service at its own expense as soon as practicable.

8.8 DELAYS, SUSPENSION, DEFERMENT
If the materials, parts or services are suspended or delayed due to no fault of WGGS, such as, but not limited to, act of God, war, act of Customer, fire, flood, strike, sabotage, embargoes, labor disputes, riots, civil disorders, accidents, delay of carriers, WGGS's voluntary or mandatory compliance with a governmental act, regulation or request, shortage of materials, single source supplier, Customer's directed supplier, or by any other cause or causes beyond WGGS's reasonable control, the time of performance, if any is specified, shall be extended for a period of time equal to the period of the delay and its consequences.

In the event Customer temporarily suspends the performance of any Services, Customer shall specify immediately in writing which part of the Services shall be suspended, the effective date of the suspension, the expected date of resumption and the mobilization and support functions which are to be maintained during the suspension period. WGGS shall advise Customer of any price change necessitated by the suspension and work shall only be suspended upon acceptance of Customer of an equitable price adjustment.

WGGS, at its option, shall be relieved of its obligation to provide the Service hereunder without further obligation, if the Customer defers start of the Service beyond three months of the starting date originally specified, or if the Service is suspended for more than three months. In any event, the date for completion shall be extended in all cases by an amount of time equal to the length of the delay.

8.9 CHANGES
Customer may order changes to the Services. Where any change causes an adjustment in price or time of completion, WGGS shall not proceed with any change until there is agreement upon an equitable adjustment to price and time of completion and a written change order/notice is received.

8.10 PATENTS
WGGS may, in the performance of this Agreement, furnish or install equipment, components, materials and supplies which may be (a) standard commercial products of WGGS; (b) purchased from other sources; (c) manufactured by or a repair method/process used by WGGS to meet the specific circumstances arising under this Agreement; (d) manufactured by WGGS in accordance with the Customer instructions; or (e) supplied by Customer. Customer understands WGGS has made no investigation of the risk of possible patent infringement as to items in categories (b), (c), (d) and (e) above, and accordingly, Customer agrees to release and hold WGGS harmless with respect to such risks.

As to items in category (a), Customer shall notify WGGS promptly in writing and give WGGS information, assistance, and exclusive authority to evaluate, defend, and settle any United States patent infringement claim. WGGS shall then at its own expense and option (a) settle such claim; (b) procure for Customer the right to use such product; (c) replace or modify it to avoid infringement; (d) remove it and refund the price less a reasonable amount for depreciation; or (e) defend against such claim. THIS PARAGRAPH SETS FORTH WGGS'S EXCLUSIVE LIABILITY WITH RESPECT TO PATENTS.

8.11 NUCLEAR INDEMNITY
When the Services are to be performed on or in connection with a nuclear facility, the CUSTOMER AGREES TO INDEMNIFY, DEFEND, AND HOLD WGGS, ITS EMPLOYEES AND AGENTS, AND ITS SUPPLIERS HARMLESS FROM ANY LOSS, LIABILITY OR CLAIM RESULTING FROM A NUCLEAR INCIDENT (SAID TERM IS DEFINED IN SECTION 11(Q) OF THE ATOMIC ENERGY ACT AS AMENDED) OCCURRING AT SAID FACILITIES (OR ANY OTHER FACILITY WHERE THE PART MAY BE USED) WHETHER OR NOT SUCH INCIDENT IS DUE TO ANYONE'S FAULT OR NEGLIGENCE INCLUDING THE SOLE FAULT OR NEGLIGENCE OF WGGS.

8.12 HAZARD COMMUNICATION
Customer acknowledges that 29 CFR 1910.1200 entitled Hazard Communication may be applicable to the Services under this Agreement and if it is, Customer is in compliance therewith. Furthermore, Customer

agrees it will provide WGGS (whose employees in the performance of this Agreement may be exposed to Customer's material) with the same information Customer is required to provide to its own employees pursuant to 29 CFR 1910.1200.

8.13 HAZARDOUS MATERIALS

Customer shall identify and notify WGGS of hazardous materials and conditions that may be encountered by WGGS personnel while at Customer site. Such notification shall include any MSDS sheets. Absent timely notification, WGGS shall be relieved from performance of this Agreement to the extent of any handling or encounter with hazardous materials. It shall be Customer's responsibility for the handling or disposal of any hazardous materials or waste, specifically including but not limited to asbestos, and CUSTOMER SHALL DEFEND, INDEMNIFY, AND HOLD WGGS HARMLESS FOR ANY DAMAGES, LOSSES, CLAIMS, JUDGMENTS, DEMANDS, CAUSES OF ACTION AND EXPENSES ARISING FROM HAZARDOUS MATERIALS EXISTING AT THE SITE OR BROUGHT TO THE SITE BY CUSTOMER OR OTHER PARTIES.

8.14 LIMITATION OF LIABILITY

NOTWITHSTANDING ANY RULE OF LAW TO THE CONTRARY OR ANY OTHER PROVISION IN THIS AGREEMENT, AND REGARDLESS OF THE FORM OF ACTION OR THEORY OF LIABILITY, INCLUDING CONTRACT, STRICT LIABILITY, NEGLIGENCE OR OTHER TORT, BREACH OF WARRANTY, INDEMNITY, OR OTHERWISE:

(A) NEITHER PARTY NOR ANY OF ITS PARTNERS, MEMBERS, AGENTS, SUBCONTRACTORS OF ANY TIER, VENDORS, DIRECTORS, OFFICERS OR EMPLOYEES SHALL BE LIABLE TO THE OTHER FOR CONSEQUENTIAL, SPECIAL, PUNITIVE, INCIDENTAL, OR INDIRECT LOSS OR DAMAGE, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF A POWER SYSTEM, COST OF CAPITAL, COST OF PURCHASED OR REPLACEMENT POWER, OR FUEL COST DIFFERENTIAL ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT;

(B) WGGS SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGE, OR EXPENSE ARISING FROM ITS FAILURE TO DISCOVER OR REPAIR LATENT DEFECTS OR DEFECTS INHERENT IN THE DESIGN OF GOODS SERVICED, UNLESS SUCH DISCOVERY, REPAIR, AND THE MEANS TO EFFECT SUCH ARE SPECIFIED IN THE SERVICE

(C) WGGS SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGE, OR EXPENSE ARISING FROM ANY ADVICE, RECOMMENDATIONS, OR ASSISTANCE PROVIDED TO CUSTOMER, BUT NOT REQUIRED BY THIS AGREEMENT; AND

(D) WGGS'S MAXIMUM LIABILITY WITH RESPECT TO THE SERVICES AND THIS AGREEMENT SHALL NOT EXCEED THE AGREEMENT PRICE.

8.15 LAW AND JURISDICTION

This Agreement shall be governed by and construed in accordance with the internal law of the State of Texas, U.S.A., without giving effect to principles of conflicts of law. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement. Each party submits to the jurisdiction of the State and/or Federal courts located in Texas and hereby agrees that any action brought to enforce this Agreement or resolve any dispute between the parties with respect to the subject matter hereof shall be brought exclusively in said court(s). The parties expressly waive any objection they may have to the jurisdiction of the State or Federal courts in Texas or the convenience of that forum.

8.16 COMPLETE AGREEMENT

This Agreement contains the complete agreement between the parties. All previous and collateral agreements (including letters, letters of intent, and purchase orders issued by the Customer), representations, warranties, or conditions not incorporated in this Agreement shall not be binding on either party. This Agreement may not be rescinded, modified, amended or terminated without the express written consent of an authorized representative of each party. The provisions of Warranty, Patents, Limitation of Liability, Nuclear Indemnity, Hazardous Materials, and Attorneys Fees shall survive the termination of this Agreement.

8.17 NOTICES

Unless otherwise requested by either party, all notices required or permitted under this Agreement must be made in writing and sent to WGGS and Customer at their respective addresses.

8.18 WAIVER

No waiver or failure to act on the part of any party to this Agreement will prevent such party from later exercising their rights under this Agreement.

8.19 SEVERABILITY

If any part of this Agreement is found to be unenforceable, the Agreement will be considered divisible as to such part with the remainder of the Agreement remaining as valid and binding as though such part were not included in the Agreement.

8.20 CONFIDENTIALITY

WGGS and Customer shall maintain the confidentiality of all information obtained from each other in connection with this Agreement. Such confidential information, which includes but is not limited to records, books, financial data, projections, computer records, intellectual property, methodologies, technical concepts, specifications, processes, or other documents, shall not be divulged to any third party and shall not otherwise be exploited commercially, except with prior written consent or as compelled by law. If WGGS or Customer is legally compelled to disclose confidential information, it will notify the other party prior to making such disclosures and take all available steps to limit such disclosures. Notwithstanding the above, the restrictions stated above shall not apply to any data and documentation:

a. which was generally available to the public at the time of disclosure or at any time thereafter;
b. which was already known by the receiving party at the time of disclosure;
c. which is independently developed by a party;
d. which becomes known to a party from a source other than the disclosing party without breach of any contractual obligation; or
e. after two (2) years from the date of execution of this Agreement.

8.21 INDEMNITY
Each party (the "Indemnifying Party") shall indemnify, defend, and hold harmless the other party and it affiliates and subcontractors of any tier, and the directors, officers, employees, agents, of each, from and against any claim, demand, action, fine, penalty, liability, judgment, loss, damage, injury, cost and expense (including reasonable attorneys' fees) resulting from (a) injury to or death of any person; or (b) damage to or loss or destruction of any real or tangible personal property, to the extent such claims are caused by the negligence or intentional misconduct of the Indemnifying Party.

8.22 ASSIGNMENT
Neither party to this Agreement may assign any right or interest in this Agreement without the written consent of the other party.

8.23 ATTORNEYS FEES
In the event either party brings a judicial or administrative proceeding to enforce any provision of this Agreement, the prevailing party shall be entitled to recover from the other party its actual costs and attorneys fees.

8.24 NO THIRD PARTY BENEFICIARIES
No provision of this Agreement shall in any way inure to the benefit of any third person to make such person a third party beneficiary of this Agreement or of any one or more of the terms hereof.

8.25 PRICING CHANGES
The price provided in a WGGS quote is based upon currently available pricing for copper, iron or other such materials from our supplier. WGGS reserves the right to pass through any increase in copper, iron or other related material costs incurred during the ordering and manufacturing process.

8.26 EXPORT CERTIFICATIONS
Buyer certifies that Buyer will not export, resell, or otherwise dispose of the Equipment in violation of any law, regulation, administrative ruling or other order issued by any branch or agency of the United States government, including the resale or export by Buyer (A) into any country not then approved for export by the United States government, or (B) to any person or entity to whom sales by US citizens are barred by the United States government at the time of any such resale or export.

WOOD GROUP Generator Services, Inc.
1113 Camina Entrada - FARMINGTON, NM 87401
PHONE (505) 327-6363 - FAX (505) 325-7515

Time and Material Rate Sheet

Published Rates effective January 1, 2007 through June 30, 2007
Outside the continental United States

1.0 Engineering and Management Services

Daily rates apply portal to portal.

- Engineer (Straight time) $135.00 per hour
- Engineer (Overtime) $186.50 per hour
- Engineer (Sunday/holiday) $229.50 per hour

Travel and living expenses will be invoiced at cost plus 10%.

2.0 Field Services

All normal travel time will be invoiced at the applicable straight time rate not to exceed 12 hours per day, per person. Test equipment and machine tools are included in the rates. Emergency response will be invoiced at the applicable hourly rate, per person.
Travel and living expenses will be invoiced at cost plus 10%.

Contract Services	$ Straight Time	$ Overtime	Sunday/Holiday
	Monday through Friday 8 hours per day	inc Saturdays	
Supervisor	$135.00	$186.30	$229.50
Generator Specialist	$125.00	$172.50	$212.50
Generator Technician	$95	$131.00	$161.50
Machinist	$95.00	$131.00	$161.50
Balance Technician	$125.00	$172.50	$172.50

3.0 Shop Services

Contract Services	$ Straight Time	$ Overtime	Sunday/Holiday
	Monday through Friday 8 hours per day	inc Saturdays	
Supervisor	$125.00	$172.50	$212.50
Generator Specialist	$125.00	$172.50	$212.50
Generator Technician	$85.00	$117.30	$144.5
Machinist	$75.00	$103.50	$127.50
Balance Bunker	$500.00	$500.00	$500.00
Balance Technician	$125.00	$172.50	$172.50

A Wood Group Company

These rates are subject to Wood Group Generator Terms and Conditions of Sale and shall be a part of and govern any Agreement entered into between Wood Group Generator Services, Inc (herein WGGS or Company) and Customer for the sale of goods and/or provision of services (collectively, "Service(s)"). WGGS rejects any modification, alteration, addition, or deletion made by Customer to any provision contained herein, and Customer's acceptance of WGGS's quotation, through any Customer order, acceptance, or direction, and WGGS's performance, is expressly limited to these standard terms, unless the parties otherwise agree in writing. The parties acknowledge that Customer may issue a purchase order and/or WGGS may issue a confirming memorandum with respect to a project or contract. To the extent there is any inconsistency between any such document(s) and these terms and conditions, these terms and conditions shall control

4.0 Purchased Materials and Services

All purchased materials, subcontractors, equipment rental and related shipping or freight cost will be invoiced at cost plus 20%.

4.0 Equipment and Tooling

Major Tool Sets: Mobile tool and office trailers containing specialty tools, rigging equipment, selected test equipment and assorted other tools to perform major inspections or projects.

$2000.00 per week
Freight at cost plus 20%

5.0 Special Requirements

Any special requirements such as safety training, special permits, licenses, special PPE equipment, etc., etc., will be invoiced at cost plus 20%.

Any hours required for these special requirements will be invoiced at the applicable hourly rates.

6.0 Customer Reports

Following the completion of each project a detailed written report shall be provided to the customer. This report will document the work performed and all test results. This report will be completed no later than 21 days after completion of the project.

7.0 Terms and Conditions

7.1 APPLICABILITY-These Terms and Conditions of Sale shall be a part of and govern the Agreement entered into between Wood Group Generator Services, Inc (herein WGGS or Company) and Customer for the sale of goods and/or provision of services (collectively, "Service(s)"). WGGS rejects any modification, alteration, addition, or deletion made by Customer to any provision contained herein, and Customer's acceptance of WGGS's quotation, through any Customer order, acceptance, or direction, and WGGS's performance, is expressly limited to the terms set forth herein, unless the parties otherwise agree in writing. The parties acknowledge that Customer may issue a purchase order and/or WGGS may issue a confirming memorandum with respect to a project or contract. To the extent there is any inconsistency between any such document(s) and these terms and conditions, these terms and conditions shall control.

7.2 PRICE AND PAYMENT-The price is stated in net United States Dollars without any deductions whatsoever and is based upon current costs for materials, wages, freight, packing, insurance, taxes, subcontractor charges, and all other charges relating to the provision of Services. WGGS reserves the right to adjust the price in the event of any increase in costs or change in the scope of Services prior to the performance of the Service. Customer, in good faith and within thirty (30) days of invoice date, may dispute any item on an invoice and notify WGGS of the reasons for the dispute. WGGS and Customer shall promptly meet and resolve such dispute, with the disputed item immediately due for payment upon settlement. Payment of the undisputed portion of the price shall be made by Customer without setoff within thirty (30) days of the invoice date in such manner and to such account as stated in the invoice. Undisputed invoices or portions thereof that are past due shall bear a service charge of the lesser of one and one-half percent (11/2%) per month or the maximum rate permitted by applicable law until paid, as well as WGGS's costs of collection, including, without limitation, actual attorneys' fees.

7.3 WARRANTY-WGGS warrants the Services will be provided or performed with the skill and care commensurate with the recognized standards prevailing in the industry. WGGS makes no warranty regarding Customer or third party designed, manufactured, or supplied Services, but will assist Customer in securing the benefit of any warranties

provided by such third parties. WGGS's warranty for each application or Service is as follows:

7.3.1 heavy industrial turbines or component repair – 8,000 operating hours, 12 months from date of installation, or 18 months from date of shipment, whichever occurs first;
7.3.2 generator services – 12 months from date of installation or 18 months from date of shipment, whichever occurs first;
7.3.3 field services – 12 months from date of service; and
7.3.4 technical field assistance – 12 months from date of service.
7.3.5 parts or component sales – 90 days from date of delivery or in accordance with the end-manufacturer's warranty

If, within the warranty period stated above, Customer discovers the Services are not as warranted and promptly notifies WGGS in writing thereof, WGGS's liability and Customer's sole and exclusive remedy in any cause of action, whether in contract, tort, breach of warranty or otherwise, is expressly limited to the repair, replacement, re-performance, or an allowance to Customer of credit for the cost of such Services, at WGGS's sole option and expense. Customer shall assume all responsibility and expense for removal, reinstallation, and freight in connection with the foregoing remedies. The same warranty obligations and conditions as expressed herein shall apply to warranted Services repaired or replaced by WGGS. WGGS shall have the right of disposal of the part(s) and material(s) that it replaces. If Customer asserts a timely warranty claim, as provided herein, WGGS shall promptly evaluate the warranty claim and advise Customer within thirty (30) days whether WGGS contests the warranty claim. If the claim is not a valid warranty claim (to the reasonable satisfaction of WGGS), then all costs of the claim evaluation shall be the responsibility of the Customer. In the event Customer elects to engage a third-party or parties to correct the Service claimed to be nonconforming, prior to the expiration of said thirty (30) day period, WGGS is released from any warranty obligation.

This warranty is subject to the following conditions: (a) the Service was properly performed by qualified personnel (if not WGGS's employees); (b) the item was operated and maintained in accordance with applicable manufacturer's guidelines and standards, overhaul manuals, service bulletins and Customer handbooks; (c) the Service has been in use under normal operating conditions, has not been subjected to misuse, neglect or accident and has not subsequently been repaired or altered, except by WGGS; (d) where the item is to be stored for any period prior to installation, acceptance by WGGS of any warranty claim is conditional upon the item being stored in accordance with the manufacturer's recommended storage procedures and conditions laid down in the maintenance instructions prepared by the manufacturer; and (e) warranty claims shall only be considered by WGGS in respect of defects that become apparent and are notified by the Customer in writing to WGGS before the expiry of the warranty period.

IT IS EXPRESSLY AGREED THE FOREGOING WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES OF ANY KIND WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND CONSTITUTES THE ONLY WARRANTY OF WGGS WITH RESPECT TO THE SERVICES.

7.4 DELIVERY/DURATION SCHEDULES-Shipping and completion schedules are based on typical manufacturing cycles and anticipated conditions prevailing at the time of contract award and are premised upon prompt receipt of all information and approvals (if required) from Customer. WGGS will make every reasonable effort to meet Customer schedules. Delivery, title, and risk of loss shall pass to Customer FCA (free carrier, Incoterms 2000), WGGS plant.

7.5 PERMITS AND TAXES-The Customer shall, at his own expense, secure any permits, tax exemption certificates, or any other authorization which may be required to permit WGGS to perform the requested Services. Any applicable duties or sales, use, excise, value-added or similar taxes will be in addition to the price and shown separately on each invoice, or in lieu thereof, the Customer may provide WGGS with an exemption or direct-pay certificate acceptable to the taxing authorities. Customer agrees to indemnify WGGS for any permits, licenses, taxes, fines or payments of any kind made by WGGS on behalf of Customer in fulfilling Customer's duties under this paragraph.

7.6 TITLE/RIGHT OF LIEN-Title to equipment repaired, modified, inspected, tested, or maintained under this Agreement shall remain with the Customer. WGGS shall have a lien upon all equipment in WGGS's possession upon which WGGS has undertaken work of any nature. In the event of nonpayment of any undisputed invoice, Customer shall be in default. WGGS's remedies for Customer's default shall include, but not be limited to, sale after notice.

7.7 INSPECTION-Within ten (10) business days of receipt by Customer of any delivery, Customer will inspect and perform any necessary testing and immediately notify WGGS of any claim that the Services are defective. Failure to timely notify WGGS in writing of any defects will constitute conclusive proof the Services delivered were accepted by Customer and received without defects. WGGS will not be responsible for any damage caused during shipment. It is the sole responsibility of Customer to file any appropriate claims with the carrier for reimbursement. WGGS will fully cooperate with Customer in making such claims. Customer may return any Service that is defective at the expense of WGGS within 20 days of delivery of such to Customer. WGGS will then replace such defective Service at its own expense as soon as practicable.

7.8 DELAYS, SUSPENSION, DEFERMENT-If the materials, parts or services are suspended or delayed due to no fault of WGGS, such as, but not limited to, act of God, war, act of Customer, fire, flood, strike, sabotage, embargoes, labor disputes, riots, civil disorders, accidents, delay of carriers, WGGS's voluntary or mandatory compliance with a governmental act, regulation or request, shortage of materials, single source supplier, Customer's directed supplier, or by any other cause or causes beyond WGGS's reasonable control, the time of performance, if any is specified, shall be extended for a period of time equal to the period of the delay and its consequences.

In the event Customer temporarily suspends the performance of any Services, Customer shall specify immediately in writing which part of the Services shall be suspended, the effective date of the suspension, the expected date of resumption and the mobilization and support functions which are to be maintained during the suspension period. WGGS shall advise Customer of any price change necessitated by the suspension and work shall only be suspended upon acceptance of Customer of an equitable price adjustment.

WGGS, at its option, shall be relieved of its obligation to provide the Service hereunder without further obligation, if the Customer defers start of the Service beyond three months of the starting date originally specified, or if the Service is suspended for more than three months. In any event, the date for completion shall be extended in all cases by an amount of time equal to the length of the delay.

7.9 CHANGES-Customer may order changes to the Services. Where any change causes an adjustment in price or time of completion, WGGS shall not proceed with any change until there is agreement upon an equitable adjustment to price and time of completion and a written change order/notice is received.

7.10 PATENTS-WGGS may, in the performance of this Agreement, furnish or install equipment, components, materials and supplies which may be (a) standard commercial products of WGGS; (b) purchased from other sources; (c) manufactured by or a repair method/process used by WGGS to meet the specific circumstances arising under this

Agreement; (d) manufactured by WGGS in accordance with the Customer instructions; or (e) supplied by Customer. Customer understands WGGS has made no investigation of the risk of possible patent infringement as to items in categories (b), (c), (d) and (e) above, and accordingly, Customer agrees to release and hold WGGS harmless with respect to such risks.

As to items in category (a), Customer shall notify WGGS promptly in writing and give WGGS information, assistance, and exclusive authority to evaluate, defend, and settle any United States patent infringement claim. WGGS shall then at its own expense and option (a) settle such claim; (b) procure for Customer the right to use such product; (c) replace or modify it to avoid infringement; (d) remove it and refund the price less a reasonable amount for depreciation; or (e) defend against such claim. THIS PARAGRAPH SETS FORTH WGGS'S EXCLUSIVE LIABILITY WITH RESPECT TO PATENTS.

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7.12 HAZARD COMMUNICATION-Customer acknowledges that 29 CFR 1910.1200 entitled Hazard Communication may be applicable to the Services under this Agreement and if it is, Customer is in compliance therewith. Furthermore, Customer agrees it will provide WGGS (whose employees in the performance of this Agreement may be exposed to Customer's material) with the same information Customer is required to provide to its own employees pursuant to 29 CFR 1910.1200.

7.13 HAZARDOUS MATERIALS-Customer shall identify and notify WGGS of hazardous materials and conditions that may be encountered by WGGS personnel while at Customer site. Such notification shall include any MSDS sheets. Absent timely notification, WGGS shall be relieved from performance of this Agreement to the extent of any handling or encounter with hazardous materials. It shall be Customer's responsibility for the handling or disposal of any hazardous materials or waste, specifically including but not limited to asbestos, and CUSTOMER SHALL DEFEND, INDEMNIFY, AND HOLD WGGS HARMLESS FOR ANY DAMAGES, LOSSES, CLAIMS, JUDGMENTS, DEMANDS, CAUSES OF ACTION AND EXPENSES ARISING FROM HAZARDOUS MATERIALS EXISTING AT THE SITE OR BROUGHT TO THE SITE BY CUSTOMER OR OTHER PARTIES.

7.14 LIMITATION OF LIABILITY-NOTWITHSTANDING ANY RULE OF LAW TO THE CONTRARY OR ANY OTHER PROVISION IN THIS AGREEMENT, AND REGARDLESS OF THE FORM OF ACTION OR THEORY OF LIABILITY, INCLUDING CONTRACT, STRICT LIABILITY, NEGLIGENCE OR OTHER TORT, BREACH OF WARRANTY, INDEMNITY, OR OTHERWISE:

7.14.1 NEITHER PARTY NOR ANY OF ITS PARTNERS, MEMBERS, AGENTS, SUBCONTRACTORS OF ANY TIER, VENDORS, DIRECTORS, OFFICERS OR EMPLOYEES SHALL BE LIABLE TO THE OTHER FOR CONSEQUENTIAL, SPECIAL, PUNITIVE, INCIDENTAL, OR INDIRECT LOSS OR DAMAGE, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE, LOSS OF USE OF A POWER SYSTEM, COST OF CAPITAL, COST OF PURCHASED OR REPLACEMENT POWER, OR FUEL COST DIFFERENTIAL ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT;

7.14.2 WGGS SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGE, OR EXPENSE ARISING FROM ITS FAILURE TO DISCOVER OR REPAIR LATENT DEFECTS OR DEFECTS INHERENT IN THE DESIGN OF GOODS SERVICED, UNLESS SUCH DISCOVERY, REPAIR, AND THE MEANS TO EFFECT SUCH ARE SPECIFIED IN THE SERVICE

7.14.3 WGGS SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGE, OR EXPENSE ARISING FROM ANY ADVICE, RECOMMENDATIONS, OR ASSISTANCE PROVIDED TO CUSTOMER, BUT NOT REQUIRED BY THIS AGREEMENT; AND (D) WGGS'S MAXIMUM LIABILITY WITH RESPECT TO THE SERVICES AND THIS AGREEMENT SHALL NOT EXCEED THE AGREEMENT PRICE.

7.15 LAW AND JURISDICTION-This Agreement shall be governed by and construed in accordance with the internal law of the State of Texas, U.S.A., without giving effect to principles of conflicts of law. The United Nations Convention on Contracts for the International Sale of Goods shall not apply to this Agreement. Each party submits to the jurisdiction of the State and/or Federal courts located in Texas and hereby agrees that any action brought to enforce this Agreement or resolve any dispute between the parties with respect to the subject matter hereof shall be brought exclusively in said court(s). The parties expressly waive any objection they may have to the jurisdiction of the State or Federal courts in Texas or the convenience of that forum.

7.16 COMPLETE AGREEMENT-This Agreement contains the complete agreement between the parties. All previous and collateral agreements (including letters, letters of intent, and purchase orders issued by the Customer), representations, warranties, or conditions not incorporated in this Agreement shall not be binding on either party. This Agreement may not be rescinded, modified, amended or terminated without the express written consent of an authorized representative of each party. The provisions of Warranty, Patents, Limitation of Liability, Nuclear Indemnity, Hazardous Materials, and Attorneys Fees shall survive the termination of this Agreement.

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7.20.1 which was generally available to the public at the time of disclosure or at any time thereafter;
7.20.2 which was already known by the receiving party at the time of disclosure;
7.20.3 which is independently developed by a party;
7.20.4 which becomes known to a party from a source other than the disclosing party without breach of any contractual obligation; or
7.20.5 after two (2) years from the date of execution of this Agreement.

7.21 INDEMNITY-Each party (the "Indemnifying Party") shall indemnify, defend, and hold harmless the other party and it affiliates and subcontractors of any tier, and the directors, officers, employees, agents, of each, from and against any claim, demand, action, fine, penalty, liability, judgment, loss, damage, injury, cost and expense (including reasonable attorneys' fees) resulting from (a) injury to or death of any person; or (b) damage to or loss or destruction of any real or tangible personal property, to the extent such claims are caused by the negligence or intentional misconduct of the Indemnifying Party.

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7.25 PRICING CHANGES - The price provided in a WGGS quote is based upon currently available pricing for copper, iron or other such materials from our supplier. WGGS reserves the right to pass through any increase in copper, iron or other related material costs incurred during the ordering and manufacturing process.

NMS

National Mechanical Services Inc.

REPORT OF WORK

PERFORMED ON

Maui Electric Company

Kahului, Maui, Hawaii 96733

Maalaea Power Plant

May 31, 2007 thru July 18, 2007

Submitted by:

Rudy Gaitan
Program Manager

NMS

National Mechanical Services Inc.

Period of Performance:	May 31, 2007 thru July 18, 2007
Location:	Maalaea Power Plant Kahului, Maui, Hawaii 96733
Purpose:	BRUSH Generator Cleaning & Testing
Persons Contacted:	Mr. Gerardo Flores, Electrical Maintenance Supervisor Mr. John Mauri Combined Cycle Plant Supervisor
Persons Performing:	Bill da Silva, Rudy Gaitan, Will Taylor, Richard Clifford, Dave Young, Jose Perez, Jorge Tremayne, Robert Alvarado, Mitchell Salts, Jorge Cortez, Reno Navarro, Eduardo Estrada

Unit Description:

Frame:	BDAX 7-167E
Machine:	61314A – 5G
KVA:	29,556
Volts:	13,800
Amps:	1,236
Frequency:	60Hz.
Speed:	3600 RPM

1640B Hoover Avenue, National City, CA 91950
Phone - 619-477-1991, Fax – 619-477-1994
info@natlmech.com

Thursday May 31, 2007

The following is a list of National Mechanical Services, Inc. employees that arrived on a flight to Maui, Hawaii:

- Rudy Gaitan, Program Manager
- Dave Young, Supervisor
- Robert Alvarado, Technician
- Christine da Silva, Office Manager

Gerardo Flores, from Maui Electric, was informed of the arrival. Mr. Flores granted NMS employees access to the Maui Electric plant for Friday, June 1st, 2007 to deliver the necessary equipment.

Friday June 1, 2007

NMS equipment, which included a rotor pulling table and associated parts, gang boxes and pallets containing wood, were loaded into the plant.

All equipment was locked upon departure from site at 11:30 a.m.

Saturday June 2, 2007

OFF (no scheduled work)

Sunday June 3, 2007

OFF (no scheduled work)

Monday June 4, 2007

NMS arrived at 7:00 a.m. to the site and attended the Safety Orientation Meeting conducted by Mr. Clinton Fukushima, Security Specialist from Maui Electric.

1640B Hoover Avenue National City, CA 91950
Phone: (619) 477-1991 Fax: (619) 477-1994
Email: info@natlmech.com

Monday June 4, 2007 *(continued)*

The following employees were in attendance as representation for National Mechanical Services:

- Bill da Silva, President/CEO/Owner
- Rudy Gaitan, Program Manager
- Will Taylor, Production Supervisor
- Dave Young
- Richard Clifford
- Jorge Tremayne
- Robert Alvarado
- Mitchell Salts
- Jorge Cortez
- Jose Nava Perez
- Reno Navarro

After orientation, NMS conducted Lock-Out/Tag-Out of the generator. Electrical disconnection of the main generator breaker was accomplished; including the tag-out of the turbine starter, turbine fuel, turning gear, space heaters and the exciter field. Generator lube oil, oil tank heater and enclosure vent fan all were secured.

A safety orientation meeting was conducted by Bill da Silva, President of NMS. The meeting topics included: hours of work, break-time, hours for shifts were established, job assignments were issued and all employees directed to work safely.

NMS employees were instructed to have their personal protective equipment on at all times, and to adhere to all Maui Electric Company rules and regulations. All current employees have been safety trained and are currently in compliance until June 4, 2008.

The generator was saturated with oil throughout the entire package and had been previously discussed and agreed upon that NMS would pressure wash the entire unit. After submitting the MSDS sheet for Simple Green, the cleaning agent that was to be used, approval was granted from the Environmental Department.

A visual inspection of the generator revealed the entire generator was saturated with oil. The existing gaskets on the generator package doors were worn and torn; therefore a replacement was necessary, of approximately 60 ft.

The Halon System was disconnected and a partial section of the wall package was removed to prepare for removal of the rotor. NMS employees then covered all electrical panels and connections, prior to starting pressure washing on the entire generator package from the inside.

Removed generator access steps and platform form unit, including the package wall, for rotor removal preparations.

Second shift finished the pressure wash along with the hand cleaning of the entire generator package.

Tuesday June 5, 2007

Installed and welded out two (2) padeyes to assist in the removal of the end frame.

Removed all lube oil piping and sealed all openings to prevent any contamination. All piping stored for reinstallation. During the disassembly it was noted that the attached lube oil pump coupling was loose on both sides of the shaft.

Existing fan tip clearances recorded and documented on the Non-Drive End (NDE). After the removal of inner shrouds and inner quad covers completed, further inspection revealed the inside of the generator was *very* oily.

The disassembly of the Drive-End (DE) began with taking apart the coupling guard and turbine wall to allow removal of coupling bolts.
Other duties performed:

- Existing fan tip clearances recorded and documented
- Exciter air gap recorded and match marked for location
- Removed inner and outer seal housings

It was revealed that the unit had enough oil inside that it poured out during the removal of the Permanent Magnet Generator (PMG). Also, the brackets from the d-leads to the fuses were found to be cracked at the welds. At the time of inspection, the bracket was completely broken and appeared to have been burning.

Two brackets would have to be re-brazed and one bracket completely replaced with new material equal to what was existing. All electrical disconnects completed and documented for removal of Non-Drive End (NDE) end frame. The electrical conduits were saturated with oil, including all the junction boxes.

T-leads were disconnected, and then windings, Resistance Thermometer Detectors (RTD) and Bentlys were all tested. Diodes and fuses on the exciter were also disconnected prior to testing exciter field, exciter armature, the Permanent Magnet Generator (PMG), stator windings and the main rotor on generator. Ground brush holder assemblies were disconnected.
All electrical disconnect of generator stator and rotor from the plant electrical system completed.

- Rotor 0 MG Ω
- Stator 28 G Ω
- Exciter field 50 G Ω
- Exciter armature 4 G Ω
- Permanent Magnet Generator (PMG) 7 G Ω

Completed the removal of the Drive-End (DE) end frame and placed in supports. Finished removal of Drive-End (DE) inner quad covers.

Second shift crew set-up the rotor table, rails and trolley, as well as, removed all the coupling bolts, in preparation for rotor pull. All the bolts from the lube oil tank cover removed to allow the "site" to remove the lube oil from the sump. Covered and installed heat lamp on the Permanent Magnet Generator (PMG).

Wednesday June 6, 2007

Existing fan tip clearances recorded and documented on the Non-Drive End (NDE) and Drive-End (DE), removed inner shrouds and quad covers. Removed inner and outer seal housings and bearing cap on the Non-Drive End (NDE) and Drive-End (DE).

Prior to disassembly, existing as found clearances on Non-Drive End (NDE) and Drive-End (DE) bearing seals to the shaft, were recorded and documented. Removed bearing cap on Non-Drive End (NDE) and Drive-End (DE). Marked and documented all coupling bolt fasteners and completed removals.

Installed ten (10) ton chain falls on the Drive-End (DE) and Non-Drive End (NDE) and prepared rotor for removal.

Rotor removal started at 2:00 p.m. and was completed by 3:15 p.m. Secured rotor with straps and installed stops to prevent trolleys from moving.

Completed all disconnects of generator space heaters.

Started cleaning retaining rings in preparation for Ultra Sonic Testing (U.T.) in the morning.

Erected tent over rotor to protect from increment weather.

During the removal of the insulating epoxy paint from the retaining rings, it was noted that the retaining rings showed signs of heat spots on the Exciter End and on the Drive-End as well. Photo documentation was recorded.

NMS notified Gerardo Flores, Electrical Maintenance Supervisor and John Mauri, Combined Cycle Plant Supervisor, both from Maui Electric of a potential problem with the rotor.

Installed the heater inside the tent and the dehumidifier inside the generator package.

Second shift cleaned the Non-Drive End (NDE) and the Drive-End (DE) generator sumps.

Thursday June 7, 2007

MIC all seals and both Non-Drive End (NDE) and DE bearings. One seal was found out of tolerance, as well as the Drive-End (DE) bearing. The wear pattern on the Drive-End (DE) bearing was grooved and needed to be re-babbitted.

Subcontractor, INSPEC Testing, accomplished the Ultra Sonic Testing (U.T.) of the retaining rings and found both rings were satisfactory. Report provided and documented.

Boroscoped the underside of both the Drive-End (DE) and the Non-Drive End (NDE) retaining rings and documented with photographs.

Notified site contact, Gerardo Flores, of results from the testing provided by INSPEC. Also, recommendations of repairs to the rotor were presented to Mr. Flores. NMS had been in contact with the OM Manufactured BRUSH and National Electric Coil (NEC) in regards to quotes for necessary repairs during the duration of inspections.

Cleaning continued on the stator for both day and second shift.

Gerardo Flores informed NMS that evening to the fact he had sent pictures to AGT Services *(contracted to the site in regards to electrical testing and repairs in the field)* to get their opinion on the rotor and/or possible repairs.

A meeting was set for 8:00 a.m. the next day, to discuss possible solutions to the rotor repairs with NMS and Maui Electric Company.

Friday June 8, 2007

NMS continued cleaning the stator.

NMS was informed that AGT Services will also be in attendance to this mornings meeting that was rescheduled for the afternoon.

Attendees at the meeting for Maui Electric were: John Mauri, Gerardo Flores, Tony Cabacungan. NMS attendees were: Bill da Silva and Rudy Gaitan. Terry Benson, was the representative from AGT Services.

The discussions centered on the 'as found' conditions of the stator. It was agreed upon by National Mechanical Services and AGT Services that the rotor retaining rings required removal in order to inspect the rotor more precisely, as well as, allow proper cleaning of the rotor windings. Also, this procedure would help determine if the heat spots were caused during installation.

Additionally, NMS would rotate the rotor 90° to allow the removal of the retaining rings. The rotor required a lift by crane (provided by the site) transported and placed on NMS skid (rails) inside of the DTCC Shop to allow AGT Services to accomplish all the new work.

In conclusion, AGT Services would accomplish the work necessary and NMS would assist on lifting the rotor from the NMS skid.

Scheduled moving of the rotor is to take place on Tuesday, June 12, 2007.

Second shift cleaned the stator completely by the end of their shift to allow AGT Services to start electrical testing the stator.

Saturday June 9, 2007

Day shift finished cleaning generator parts, housekeeping inside the generator and the rotor table.

Gerardo Flores contacted NMS requesting additional cleaning of the stator. NMS employees Mr. Taylor and Mr. Gaitan meet with Mr. Flores at the site where he demonstrated that some of the cooling slots still contained traces of dirt and grease. A second set of windings located underneath were slightly dirty, including the windings.

AGT Services was conducting an El Cid/Wedge Tap test at that time and wouldn't be complete until around 5:30 p.m. During the testing process, NMS was unable to access the stator.

It was agreed upon by NMS and Mr. Flores, Maui Electric, that the stator would be more thoroughly cleaned the following day, when available.

Sunday June 10, 2007

Day shift crew cleaned the entire stator again, specifically concentrating on areas of concern brought to attention of NMS by Gerardo Flores.

Monday June 11, 2007

Cleaned seal housings, inner and outer generator covers, exciter parts, space heaters, end frame and cut new lube oil gaskets for all lube oil piping. Moved rotor back an additional 3 feet to allow the crane to pick it up first thing Tuesday morning.

Tuesday June 12, 2007

The rotor was lifted from the NMS skid, rotated and transported to Building DTCC Shop and placed on NMS rails to allow AGT Services to start removing the retaining rings off the rotor.

A meeting was held to determine that NMS would be flown back to San Diego, CA, while work was being done on the rotor by AGT Services.

Wednesday June 13, 2007

All NMS crew flew back home until repairs to rotor are completed by AGT Services.

Tuesday June 19, 2007

All NMS crew flew back to Maui.

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Wednesday June 20, 2007

NMS met with AGT Services to discuss the repairs performed on the rotor. AGT Service Representative, Terry Benson, stated that they only found the rotor excessively dirty with oil, dirt and grease. No apparent shorts were found.

The exciter retaining ring was found 30 thousandths out of tolerance from when it was originally installed. Both retaining rings had been removed and the cleaning of the rotor was completed.

The Drive-End (DE) retaining ring had been reinstalled and AGT Services was, at that time, in the process of reinstalling the exciter retaining ring.

Preparations for reinstallation of the rotor continued; gaskets for seal housings cut, lube oil piping gaskets cut, oil seals cleaned, new Drive-End (DE) bearing MIC and set up of all wood on the skid.

National Electric Coil (NEC) Representative Joe Garcia arrived to record all the coil, windings and wedge data for future re-wedge.

Second shift cleaned the coupling guard flange on the rotor and on the turbine package wall area. All lube oil piping was cleaned inside and out. The section of package wall that was removed to allow the rotor removal was high pressure washed and cleaned. Wire brushing of all nuts and bolts was started.

June 21, 2007 Thursday

Finished cleaning all nuts and bolts. Bearings were re-tapped to make sure no debris was present, along with holes on the end frame and outer cover.

INSPEC Testing completed the Ultra Testing (U.T.) of the re-installed retaining rings and found both rings are satisfactory.

A meeting with Maui Electric (Jerry, John and Tony), AGT Services (Terry Benson) and Rudy Gaitan (NMS) was conducted at 10:30 a.m. Focus was specific to the work accomplished by AGT Services *(as found and as released)* and the process.

The rotor was simply found dirty with excessive oil, dirt and grease after the retaining rings were pulled off. Then was thoroughly cleaned and reassembled. All megger readings were found satisfactory and the rotor was ready to be installed.

After Mr. Benson departed from the meeting, NMS and Maui Electric discussed the next phase of the project. The crane and flatbed were to arrive at 7:00 a.m. that following day. Then the rotor could be moved over. Upon completion of the generator reassembly (scheduled for Monday), John Mauri was planning a crank wash that would take a full day to complete. He would then accomplish a slow run on the generator and check to see if a balance would be needed.

Mr. Mauri wanted to make sure that someone from NMS was available for light-off and if any problems arose.

Mr. Flores requested a price quote from NMS for the Ultra Testing perfonned by Inspect Testing, as well as a quote to rebabbitt the Drive-End (DE) bearing.

Second shift prepared for installation of the rotor by staging all generator parts, as well as, cleaned the entire wall package, walls and floors.

June 22, 2007 Friday

The crane arrived at 7:15 a.m. for relocating the rotor back to the generator package. NMS moved the rotor using trolley system and rails. Delay was encountered due to the crane company bringing out plates that were dimpled *(dished)*. This caused the rotor to rock back and forth during the relocation back to the generator area.

The crane company was notified to bring the proper plate prior to us moving the rotor. Crane crew left to pick up additional steel plates at 7:30 a.m.

Flatbed truck arrived back with the proper plating, which enabled the crane to be ready for placing the rotor back unto the skid. Reinstallation of the rotor back into the stator was completed. Skid rails were removed to allow installation of the end frame, which were installed with only com-a-longs due to unavailability of the boom truck.

Second shift continued installing inner quad covers, breakdown of rotor table and storing all equipment. All table legs, rails, skid plates and blocks were installed back into sea container.

June 23, 2007 Saturday

Installed Non-Drive End (NDE) and Drive-End (DE) bearings. Installed seals on Non-Drive End (NDE). Reinstalled space heaters and reconnected them. Reinstalled all T-Leads and covers.

Installed Permanent Magnet Generator (PMG), seal housings, bearing caps on the Non-Drive End (NDE) and the Drive-End (DE). Reinstalled outer generator covers on the Drive-End (DE). Installed all coupling bolts and torqued to specifications.

Installed fan shrouds and measured and documented "as released" readings on both Non-Drive End (NDE) and Drive-End (DE).

Reinstalled all lube oil piping using new gaskets and attached lube oil pump. Installed new rundown tank hoses supplied by Maui Electric. Reinstalled all door gaskets using old existing gaskets.

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June 24, 2007 Sunday

Reinstalled the exciter and diode ring and reconnected the earth grounding brush. Installed all space heater covers.

On both the Non-Drive End (NDE) and the Drive-End (DE), Bentlys were set and installed.

Reinstalled package wall section and platform steps.

Accomplished a complete wipe down of the generator, bilge, floors, and outside of the wall package.

June 25, 2007 Monday

All work complete and placed on standby while Maui Electric accomplishes a crank wash on Tuesday (26th) and hydraulic testing on Wednesday (27th).

June 26, 2007 Tuesday

Entire crew on stand-by.

June 27, 2007 Wednesday

Entire crew on stand-by.

June 28, 2007 Thursday

Troubleshoot the new Human Machine Interface (HMI) system installed by G.E.

The turbine side had fuel valve and hydraulic starter pump issues, which prevented the rotation of the generator.

June 29, 2007 Friday

NMS employees continued troubleshooting of the new Human Machine Interface (HMI) system. Inside the control room, it was determined that there was a faulty relay switch in the control panel.

Sync was achieved – idle speed on the generator for 15 minutes, due to the main breaker being racked out. Both of the lube oil site glasses were verified to have flow.

Claude Kouchi (MEZCO) verified that the rotor needed no trim balancing on the radial plain.

June 30, 2007 Saturday

Due to high bearing drain temperature readings on the Non-Drive End (NDE), it was determined that the parameter in the Human Machine Interface (HMI) system was set too low. This temperature was increased to 200 degrees by the G.E. Representative (John) and John Mauri.

During the final light off, 10.5 megawatts was achieved. Bearing drain temps, bearing temps and vibrations were all satisfactory.

July 1, 2007 Sunday

Non-Drive End (NDE) and Drive-End (DE) Bently probes were checked and adjusted accordingly.

A discovery was made while investigating the lube oil lines that a check valve on the discharge side of the attached lube oil pump was installed incorrectly.

It was determined that the 110 amp breaker was being overloaded, therefore causing the breaker to trip. The Non-Drive End (NDE) was inspected in which, no debris was found.

July 2, 2007 Monday

The top half of the bearing was removed and NMS made a discovery that the babbitting was severely damaged. Both halves of the Non-Drive End (NDE) bearing were severely damaged.

A new Non-Drive End (NDE) bearing (which was provided by Maui Electric's warehouse) was used to replace it.

Upon examination of the Drive-End (DE) bearing, the bearing and the inner thrust pads were found to be severely damaged, as well.

Mr. Mauri made the decision to reuse an old bearing. Replacement thrust pad buttons were ordered and the Drive-End (DE) inner oil seal was cleaned. Lube oil pump discharge piping was reinstalled.

July 3, 2007 Tuesday

A new gasket for the strainer was made. The rotor was thrust approximately 1/8" towards the exciter end in order to roll the thrust pad assemblies in.

The bottom halves of the Drive-End (DE) and Non-Drive End (NDE) bearings were rolled in and achieved good check clearance.

July 4, 2007 Wednesday

The Non-Drive End (NDE) fan shroud assemblies, the diode ring and the Permanent Magnet Generator (PMG) areas were inspected for rubbing or wear marks and none were found.

The Non-Drive End (NDE) bearing cap, upper seal housings, capillary tube, air tube, bearing Resistance Thermometer Detectors (RTD), outer quads, air vent housing and Bentlys were all successfully reinstalled.

July 5, 2007 Thursday

Twenty (20) new thrust pads were installed onto the Drive-End (DE) assembly.

July 6, 2007 Friday

High vibrations were revealed on the Non-Drive End (NDE) vertical probe. Disassembling the Non-Drive End (NDE) was required for an additional inspection.

July 7, 2007 Saturday

Upon inspection of the Non-Drive End (NDE) bearing, it was discovered that the babbitting was separating from the bearing on the horns. Also, a hairline crack in the lower inner oil seal was found.

It was determined that NMS would have to wait for the other bearings to be re-babbitted and then be shipped back to Maui.

July 8, 2007 Sunday

No work performed. NMS had to wait until bearings were re-babbitted.

July 9, 2007 Monday

NMS employees returned to San Diego, CA.

July 13, 2007 Friday

NMS employees returned to site at 12:00 p.m. Mr. Mauri was contacted and approved NMS to disassemble the Drive-End (DE) of unit M14. Disassembly of the Bentlys and coupling guard was also performed.

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July 14, 2007 Saturday

The old Drive-End (DE) bearing was removed, the journal cleaned and the lower half of new bearing and thrust pad assembly was installed.

The old bearing on the Non-Drive End (NDE) was removed and the lower half new bearing was installed. The lower outer seal housing on the Non-Drive End (NDE) was installed. The lower half seal housings were both checked for broken continuity and none was detected.

Good cheek clearances were achieved on the Drive-End (DE) and a good lead crush on the new bearing. Both of the thrust pad assemblies had a clearance of 0.010. The lower outer half seal housing and all five oil seals were set. All five oil seals on the Non-Drive End (NDE) were set.

The bearing backing metal Resistance Thermometer Detectors (RTD) were changed out. The Resistance Thermometer Detectors (RTD) from the Non-Drive End (NDE) were installed on the Drive-End (DE). The Drive-End (DE) Resistance Thermometer Detectors (RTD) were installed on the Non-Drive End (NDE) bearing because of spring tension.

After wiping out the upper bearing sumps, both bearing caps and all four upper seal housings were installed. All inner tubes and both capillary tubes were installed.

Both ends were covered with plastic, prior to departure of NMS employees.

July 15, 2007 Sunday

The Drive-End (DE) was reassembled. The outer quads, coupling guard, earth to ground brush, Bentlys and the outer air tube were installed. The attached lube oil pump, associated piping and diode ring covers were also installed.

The outer quads, Bentlys, air vent housing, exciter air probes, Permanent Magnet Generator (PMG) dust covers and outer air tube were reassembled in the Non-Drive End (NDE).

All Bentlys were set to -10.00 volts. Bearing backing metal Resistance Thermometer Detectors (RTD) were verified and ensured that all drain and bearing Resistance Thermometer Detectors (RTD) that came through the sump had a proper oil grommet installed.

July 16, 2007 Monday

Light-off performed at 8:30 a.m. which tripped due to hydraulic starter problems. The second light-off performed at 8:45 a.m. shut down due to low lube oil pressure on turbine at 3600 RPM. The final light-off, at 10:50 a.m. was shut down at or around 8:00 p.m.

July 17, 2007 Tuesday

Five (5) light-offs were performed between the hours of 9:08 a.m. and 12:54 p.m.

One trip, due to NGGDOT blow out was detected when attempted to raise Megawatts from 14 to 16 too fast, which was a software issue. A trip occurred after boiler purge due to hydraulic starter high temp.

July 18, 2007 Wednesday

Four (4) light-offs were performed between the hours of 7:45 a.m. and 10:21 a.m.

One trip was due to NGG failed to reach 1200 RPM. A shut down occurred due to a blown fuse on Generator Voltage Regulator. An oil leak was detected on discharge side of attached lube oil pump (braided hose), which was replaced with a new one, provided by site.

Recommendations:

Continue to operate this unit using the O.E.M. guidelines and recommended maintenance schedules.

Inspect all braided wire hoses and oil piping for leaks during scheduled shut downs.

Inspect the outer Non-Drive End (NDE) and Drive-End (DE) for oil seal leaks.

Continue to monitor the vibration levels.

Continue to monitor the bearing backing metal Resistance Thermometer Detectors (RTD) for high temperatures.

Change out all door seal gaskets when opportunity arises.

Continue to monitor the generator oil supply temperature. Possibly may need a lube oil cooler cleaning.

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NMS

National Mechanical Services Inc.

INSULATION RESISTANCE TEST RESULTS "AS FOUND"

TIME	MAIN SATOR 5000 V	MAIN ROTOR 500 V	EX FIELD 500 V	EX. ARMATURE 500 V	PMX FIELD 500 V
30 SEC	1.5 G Ω	0 Ω	2 G Ω	3 G Ω	2 G Ω
1 MIN	=				
2 MIN	4				
3 MIN	5				
4 MIN	6				
5 MIN	8				
6 MIN	8				
7 MIN	9				
8 MIN	9				
9 MIN	10				
10 MIN	10				
PI	3.3				

MACHINE TYPE: BOAX 167
MACHINE NO. 61314A – 5G
SITE MAUI ELECTRIC

STATOR P.I. 3.3
ROTOR P.I.
WINDING TEMP
AMBIENT TEMP

TESTED BY: Jorge Tremayne

DATE: 06/05/07

(-) DIODES	(+)
1) 0.408	4) TWD 0.371
2) 0.366	5) 0.384
3) 0.364	6) 0.382

RTDS			
1) 110 Ω	4) 110 Ω	7) 110 Ω	10) 110 Ω
2) 110 Ω	5) 110 Ω	8) 110 Ω	11)
3) 110 Ω	6) 110 Ω	9) 110 Ω	12)

Bearing RTD
DE 118 Ω
NDE 118 Ω

NMS

National Mechanical Services Inc.

INSULATION RESISTANCE TEST RESULTS "AS RELEASED"

TIME	MAIN SATOR 5000 V Ω	MAIN ROTOR 500 V	EX FIELD 500 V	EX. ARMATURE 500 V	PMX FIELD 500 V
30 SEC	1.5 G Ω	1.5 G Ω	7G Ω	5G Ω	2G Ω
1 MIN	=				
2 MIN	4				
3 MIN	5				
4 MIN	6				
5 MIN	8				
6 MIN	8				
7 MIN	9				
8 MIN	9				
9 MIN	10				
10 MIN	10				

MACHINE TYPE: BDAX 167
MACHINE NO. 61314A – 5G
SITE MAUI ELECTRIC

STATOR P.I. 5
ROTOR P.I.
WINDING TEMP
AMBIENT TEMP

TESTED BY: Jorge Tremayne

DATE: 06/24/07

(-) DIODES	(+)
1) 0.408	4) TWD 0.371
2) 0.366	5) 0.384
3) 0.364	6) 0.382

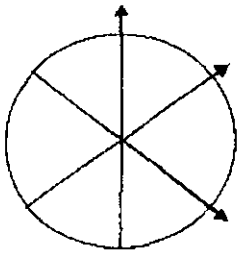
RTDS			
1) 110 Ω	4) 110 Ω	7) 110 Ω	10) 110 Ω
2) 110 Ω	5) 110 Ω	8) 110 Ω	11)
3) 110 Ω	6) 110 Ω	9) 110 Ω	12)

Bearing RTD
DE 118 Ω
NDE 118 Ω

NMS

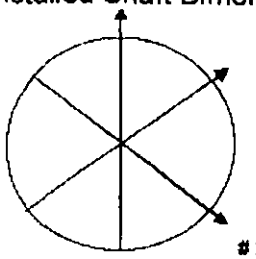
National Mechanical Services Inc.

As Installed Shaft Dimensions



1

Feeler Gage Reading
TOP 0.008
BOTTOM 0.0025



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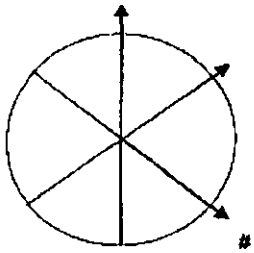
0.009
0.0025



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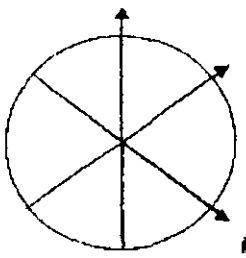
0.008
0.0025



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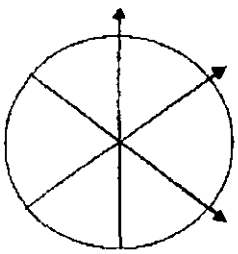
Feeler Gage Reading
TOP 0.010
BOTTOM 0.007



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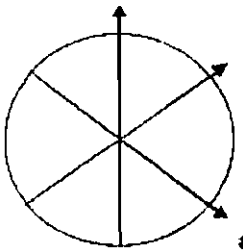
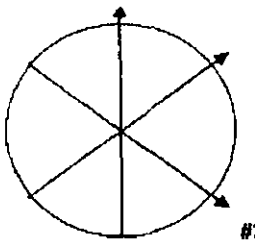
0.006
0.0025



#6

NEW SEAL
0.0025
0.0025



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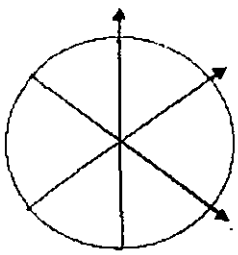
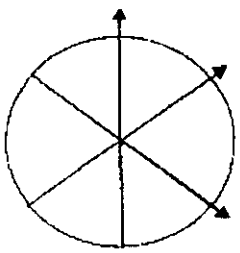
Feeler Gage Reading
TOP 0.007
BOTTOM 0.0025



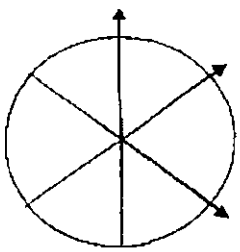
#8

0.008
0.0025



#9

0.010
0.0025



#10

Feeler Gage Reading
TOP 0.007
BOTTOM 0.0025

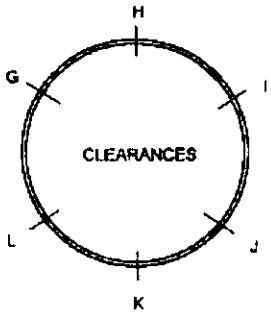
NMS

National Mechanical Services Inc.

Fan Shroud
Clearance Checks
Drive End

Position	As Found	As Released
2 O'clock (I)	.066	0.053
4 O'clock (J)	.066	0.040
6 O'clock (K)	.000	0.040
8 O'clock (L)	.043	0.040
10 O'clock (G)	.043	0.053
12 O'clock (H)	.086	0.053

** All reading are taken looking into the generator.**



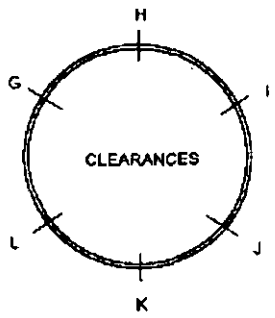
NMS

National Mechanical Services Inc.

Fan Shroud
Clearance Checks
Non Drive End

Position	As Found	As Released
2 O'clock (I)	.053	0.041
4 O'clock (J)	.053	0.041
6 O'clock (K)	.050	0.041
8 O'clock (L)	.053	0.041
10 O'clock (G)	.053	0.041
12 O'clock (H)	.079	0.041

** All reading are taken looking into the generator.**



NMS

National Mechanical Services Inc.

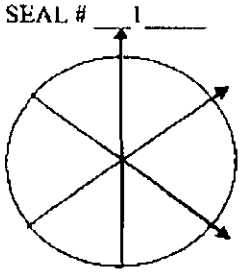
SEAL DIMENSION REPORT DRIVE END

CUSTOMER: Maui Electric

JOB NUMBER: 1611

DATE: 6/7/07

SEAL # 1

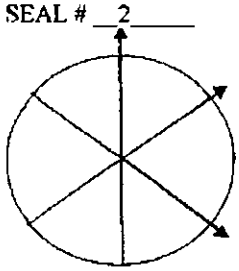


A: 11.514

B: 11.514

C: 11.516

SEAL # 2

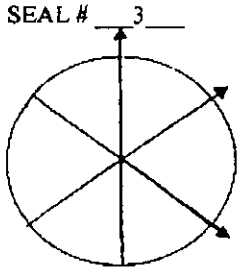


A: 11.514

B: 11.515

C: 11.514

SEAL # 3

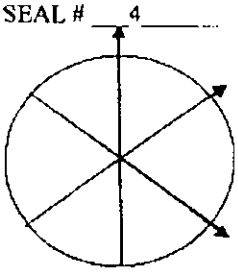


A.: 11.514

B: 11.513

C: 11.515

SEAL # 4

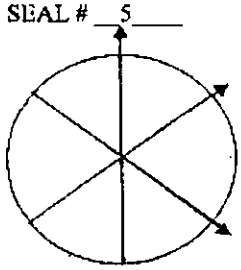


A: 11.513

B: 11.516

C: 11.514

SEAL # 5



A: 11.514

B: 11.516

C: 11.5155

DATA TAKEN BY: Will Taylor
AS FOUND X AS RELEASED _____

Nominal tolerance: bdax-167 (11.508 – 11.516) bdax-290 (13.788 – 13.795)
Both Inner & Outer Journals Read 11.498

NMS
National Mechanical Services Inc.

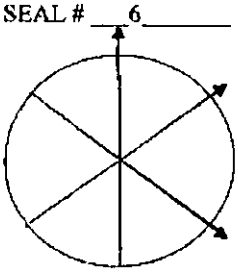
SEAL DIMENSION REPORT NON DRIVE END

CUSTOMER Maui Electric

JOB NUMBER 1611 MACHINE ID 167

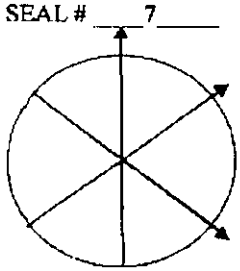
DATE 6/7/07

SEAL # 6



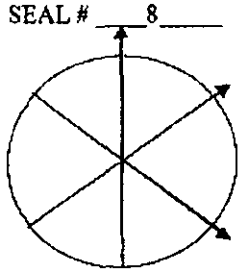
A: 11.519
B: 11.515
C: 11.512

SEAL # 7



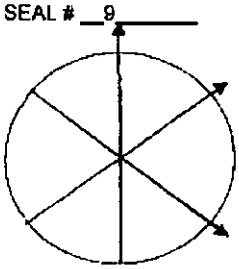
A: 11.513
B: 11.511
C: 11.513

SEAL # 8



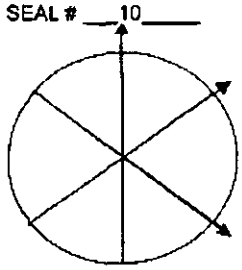
A: 11.513
B: 11.511
C: 11.513

SEAL # 9



A: 11.518
B: 11.515
C: 11.5145

SEAL # 10



A: 11.512
B: 11.5105
C: 11.512

DATA TAKEN BY: Will Taylor

AS FOUND X AS RELEASED

NOMINAL TOLERANCE: BDAX-167 (11.508 – 11.518) BDAX-280 (13.788 – 13.795)

ADDITIONAL COMMENTS

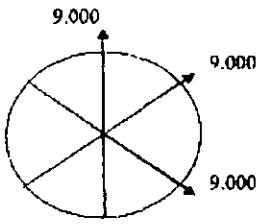
Both inner & outer seal journals read = 11.500

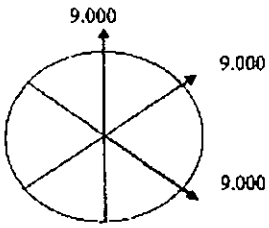
NMS

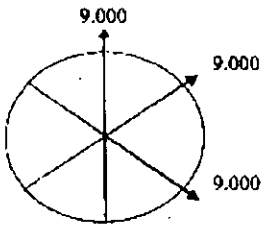
National Mechanical Services Inc.

AS FOUND SHAFT & BEARING DIMENSIONS

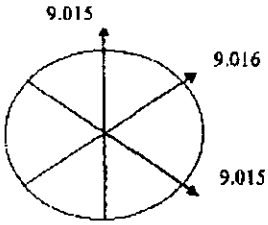
Non-Drive End Shaft

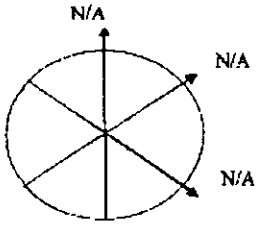


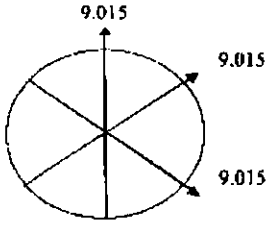




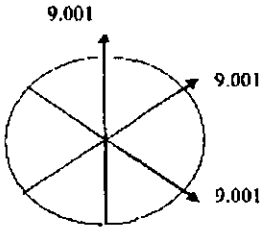
Non-Drive End Bearing

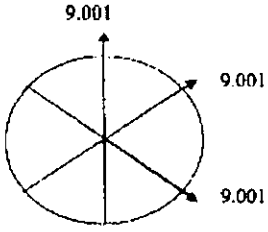


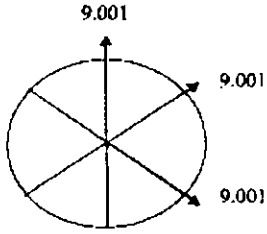




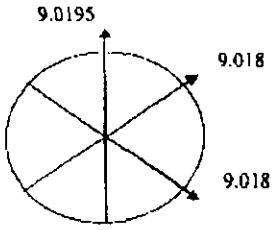
Drive End Shaft

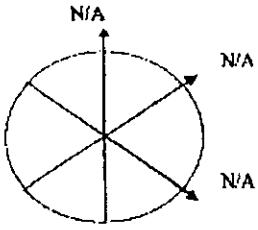


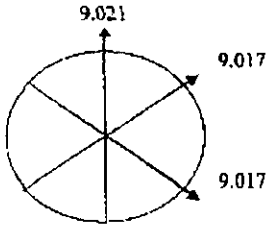




Drive End Bearings





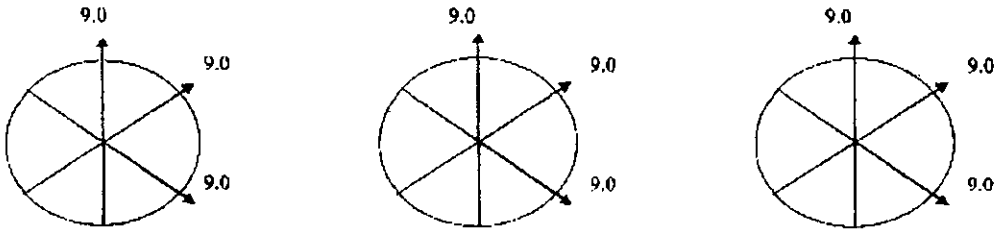


NMS

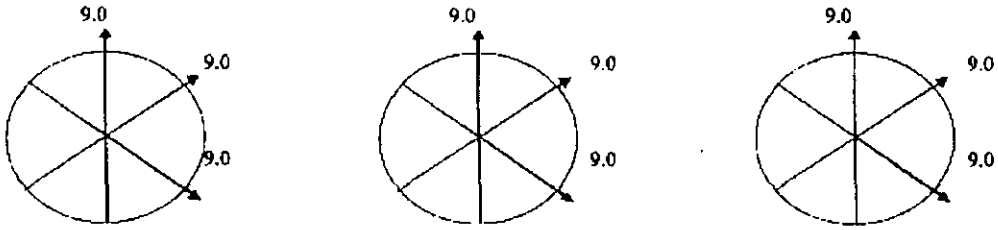
National Mechanical Services Inc.

AS INSTALLED SHAFT & BEARING DIMENSIONS

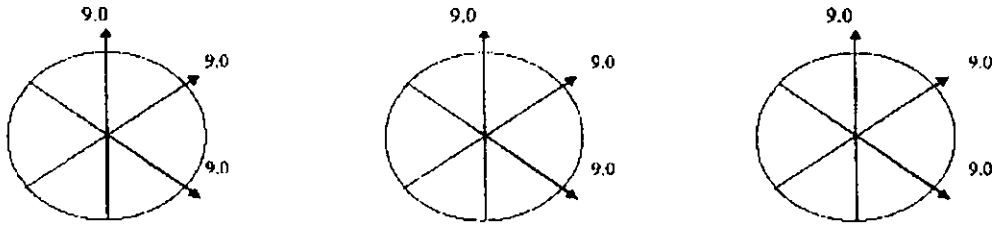
Non-Drive End Shaft



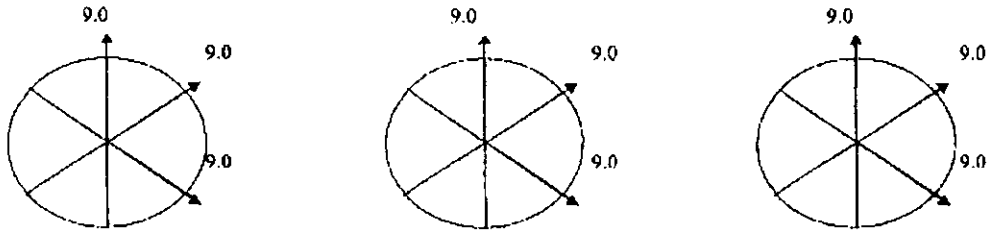
Non-Drive End Bearing



Drive End Shaft



Drive End Bearings



NMS
National Mechanical Services Inc.

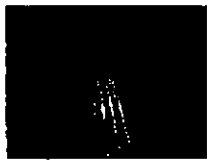
WIRE REMOVAL FORM

Air Temperature Probes

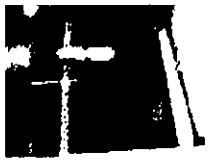
DATE: 6/22/07

LEAD NUMBER	TERMINAL NUMBER	REMOVED BY	INSTALLED BY	CHECKED BY	
22AB	1	J.T.	J.T.	W.T.	
22AC-22AA	2	J.T.	J.T.	W.T.	#1
22BA-22BC	3	J.T.	J.T.	W.T.	
22BB	4	J.T.	J.T.	W.T.	
13BA-13BC	1	J.T.	J.T.	W.T.	
13BB	2	J.T.	J.T.	W.T.	#2
13AB	3	J.T.	J.T.	W.T.	
13AC-13AA	4	J.T.	J.T.	W.T.	
30BC-30AA	1	J.T.	J.T.	W.T.	
30BB	2	J.T.	J.T.	W.T.	#3
30AB	3	J.T.	J.T.	W.T.	
30AC-30AA	4	J.T.	J.T.	W.T.	
Ground Fault Indicator					
FRONT		FRONT			
19	TOP RIGHT	J.T.	J.T.	W.T.	
20	TOP LEFT	J.T.	J.T.	W.T.	
30	BOTTOM CENTRE	J.T.	J.T.	W.T.	
BACK					
19	TOP LEFT	J.T.	J.T.	W.T.	
20	TOP RIGHT	J.T.	J.T.	W.T.	
30	BOTTOM CENTRE	J.T.	J.T.	W.T.	

Heat spots on Retaining ring


1611 Maui Electric 181 stator core after cleaning N...

1611 Maui Electric NDE retaining ring Boroscope


1611 Maui Electric 001 Lube Oil Piping

1611 Maui Electric 002 Lube Oil tank leak

1611 Maui Electric 003

1611 Maui Electric 004 Existing Oil Leaks in bilge

1611 Maui Electric 005 Generator Package Interior

1611 Maui Electric 006 DE

1611 Maui Electric 007 Lube Oil Piping

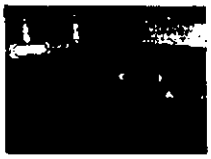
1611 Maui Electric 008 Lube OilPiping

1611 Maui Electric 009 Existing Lube Oil Leaks

1611 Maui Electric 010 NDE prior to removal

1611 Maui Electric 011 DE prior to removals

1611 Maui Electric 012 DE prior to removals


1611 Maui Electric 013 NDE RTD's

1611 Maui Electric 014 Existing Temp Probes

1611 Maui Electric 015 Existing Halon System

1611 Maui Electric 016 Temp Probe

1611 Maui Electric 017 Temp Probes

1611 Maui Electric 018 Attached Lube Oil Pump

1611 Maui Electric 019 DE prior to removal

1611 Maui Electric 020 RTD's

1611 Maui Electric 021 Existing DE prior to removal

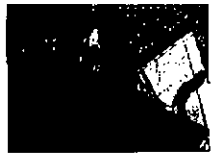
1611 Maui Electric 022 DE prior to removal

1611 Maui Electric 023 Bently cabinets

1611 Maui Electric 024 Rundown Tank NDE

1611 Maui Electric 025 NDE Sreens

1611 Maui Electric 026 Package wall disassembly


1611 Maui Electric 027 Package wall disassembly

1611 Maui Electric 028 Package wall removed

1611 Maui Electric 029 Lube Oil Piping

1611 Maui Electric 030

1611 Maui Electric 030 Lube Oil Piping

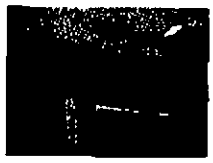
1611 Maui Electric 031 Attached Lube Oil Pump

1611 Maui Electric 032 Attached Lube Oil Pump

1611 Maui Electric 033 NDE prior to disassembly

1611 Maui Electric 033 UT of Rotor

1611 Maui Electric 034 NDE electrical


1611 Maui Electric 034 UT of Rotor

1611 Maui Electric 035 NDE Bently's

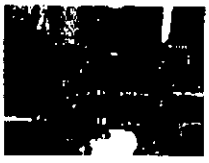
1611 Maui Electric 036 Lube Oil Piping

1611 Maui Electric 037 Lube Oil Piping

1611 Maui Electric 038 Lube Oil Piping

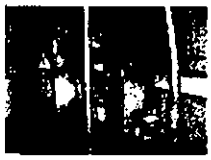
1611 Maui Electric 039 Attached Lube Oil Pump

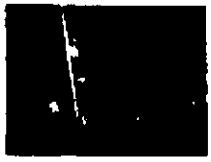
1611 Maui Electric 040 Lube Oil Piping

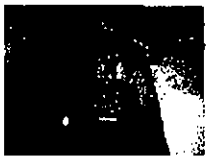

1611 Maui Electric 041 Lube Oil Piping

1611 Maui Electric 042 Lube Oil Piping

1611 Maui Electric 043 Electrical protection prior t...


1611 Maui Electric 044 DE prior to disassembly


1611 Maui Electric 045 DE Bently


1611 Maui Electric 046 DE rundown tank

1611 Maui Electric 047 Lube Oil Piping

1611 Maui Electric 048 NDE Bently

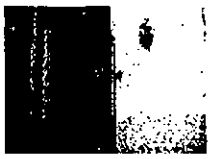
1611 Maui Electric 049 Attached Lube Oil Pump P...

1611 Maui Electric 050 Attached lube oil pump pip...

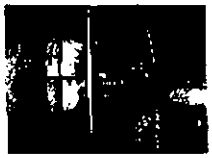
1611 Maui Electric 051 Lube Oil Piping

1611 Maui Electric 052 Lube Oil Piping

1611 Maui Electric 053 DE prior to disassembly


1611 Maui Electric 054 DE after washing

1611 Maui Electric 055 Generator package after w...


1611 Maui Electric 056 DE after washing

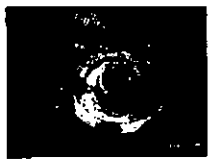
1611 Maui Electric 057 De rundown tank after washing

1611 Maui Electric 058 NDE after washing

1611 Maui Electric 059 NDE rundown tank after washing

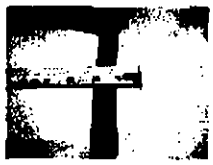
1611 Maui Electric 060 Electrical panels after was...

1611 Maui Electric 061


1611 Maui Electric 062 As found check valve

1611 Maui Electric 063 foreign material found in c...

1611 Maui Electric 064 foreign material found in c...


1611 Maui Electric 065 package door gasket

1611 Maui Electric 066 package door gasket

1611 Maui Electric 067 package door gasket

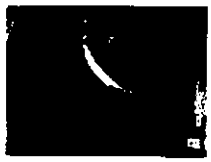
1611 Maui Electric 068 package door gasket

1611 Maui Electric 069 package door gasket

1611 Maui Electric 070 package wall gasket

1611 Maui Electric 071 NDE electrical panel full of oil

1611 Maui Electric 072 electrical panel full of oil


1611 Maui Electric 073 NDE inner quad covers

1611 Maui Electric 074 Exciter

1611 Maui Electric 075 Diode assembly

1611 Maui Electric 076 locking bar prior to removal

1611 Maui Electric 077 as found broken electrical fitting

1611 Maui Electric 078 as found exciter

1611 Maui Electric 079 as found exciter

1611 Maui Electric 080 crack welds on fuse holder

1611 Maui Electric 081 broken tab on exciter fuse...

1611 Maui Electric 082 crack welds on fuse holder asse...

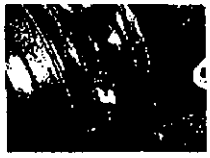
1611 Maui Electric 083 NDE inner quads

1611 Maui Electric 084 DE inner quads

1611 Maui Electric 085 NDE inner quad covers

1611 Maui Electric 086 as found generator sump NDE

1611 Maui Electric 087 as found generator sump DE


1611 Maui Electric 088 as found NDE oil seals

1611 Maui Electric 089 Existing NDE Seal clearan...

1611 Maui Electric 090End Frame Removal

1611 Maui Electric 091 End Frame removal attempt

1611 Maui Electric 092 End Frame on stands

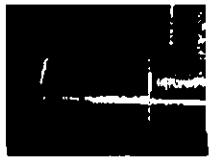
1611 Maui Electric 093 Rotor Prior to removal

1611 Maui Electric 094 Existing Windings Condition

1611 Maui Electric 095 Oil inside stator box

1611 Maui Electric 096 NDE Journal covered

1611 Maui Electric 097 Rotor on Chainfall


1611 Maui Electric 98 NDE Journal

1611 Maui Electric 099

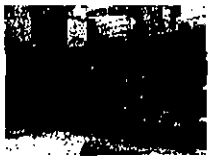
1611 Maui Electric 99 NDE Journal

1611 Maui Electric 100 DE Jornal

1611 Maui Electric 101 DE Journal

1611 Maui Electric 102 NDE Bearing

1611 Maui Electric 103 table set-up to pull rotor


1611 Maui Electric 104 ready to pull rotor

1611 Maui Electric 105 rotor removal in process

1611 Maui Electric 106 T-leads disconnected

1611 Maui Electric 107 rotor removal in process

1611 Maui Electric 108 rotor removal in process

1611 Maui Electric 109 rotor removal in process

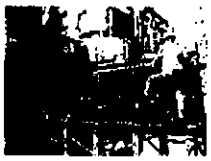
1611 Maui Electric 110 DE rotor removal set-up

1611 Maui Electric 111

1611 Maui Electric 112 NDE journal

1611 Maui Electric 113 NDE journal

1611 Maui Electric 114 rotor removal in process


1611 Maui Electric 115 rotor removal being started

1611 Maui Electric 116 rotor removal in process

1611 Maui Electric 117 rotor removal in process

1611 Maui Electric 118 rotor removal in process

1611 Maui Electric 119 rotor removal completed

1611 Maui Electric 120 Motiely Crew

1611 Maui Electric 121 as found stator NDE

1611 Maui Electric 122 as found windings NDE

1611 Maui Electric 123 space heaters

1611 Maui Electric 124 as found windings NDE

1611 Maui Electric 125 as found windings NDE

1611 Maui Electric 126 as found stator core NDE

1611 Maui Electric 127 as found windings DE

1611 Maui Electric 128 as found windings DE

1611 Maui Electric 129 as found stator core DE

1611 Maui Electric 130 DE bearing

1611 Maui Electric 131 Exciter retaining ring

1611 Maui Electric 132 Exciter retaining ring

1611 Maui Electric 133 DE retaining ring

1611 Maui Electric 134 DE retaining ring

1611 Maui Electric 135 Ultra Sonic testing in process

1611 Maui Electric 136 Ultra Sonic testing in process

1611 Maui Electric 137 rotor table ready for rotor removal

1611 Maui Electric 138 rotor table ready for rotor removal

1611 Maui Electric 139 rotor removal

1611 Maui Electric 140 T-leads disconnected

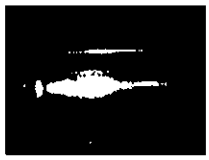
1611 Maui Electric 141 journak blocking in position

1611 Maui Electric 142 rotor removal starting

1611 Maui Electric 143 rotor removal in process

1611 Maui Electric 144 DE rotor removal set-up

1611 Maui Electric 145


1611 Maui Electric 146 DE journal

1611 Maui Electric 147 DE journal

1611 Maui Electric 148 Rotor removal in process

1611 Maui Electric 149 rotor removal in process

1611 Maui Electric 150 rotor removal in process

1611 Maui Electric 151 rotor removal in process

1611 Maui Electric 152 rotor removal in process

1611 Maui Electric 153 rotor removal completed

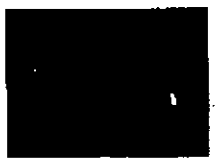
1611 Maui Electric 155 skid plate installation

1611 Maui Electric 156 windings prior to rotor rem...

1611 Maui Electric 157 windings before cleaning DE

1611 Maui Electric 158 windings before cleaning DE

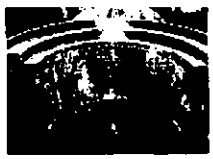
1611 Maui Electric 159 stator core before cleaning...


1611 Maui Electric 160 space heater after cleaning

1611 Maui Electric 161 windings after rotor remov...

1611 Maux Electric 162 windings prior to c_leanin...

1611 Maui Electric 163 stator core after rotor remo...


1611 Maui Electric 164 NDE Bearing

1611 Maui Electric 165 exciter retaining ring as fo...

1611 Maui Electric 166 exciter retaining ring as fo...

1611 Maui Electric 167 DE retaining ring as found

1611 Maui Electric 168 DE retaining ring as found

1611 Maui Electric 169 Ultra Soninc testing in process

1611 Maui Electric 170 exciter ring as found

1611 Maui Electric 171 DE as found gunstock

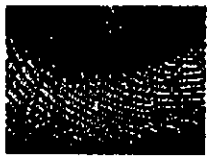
1611 Maui Electric 172 windings being cleaned DE

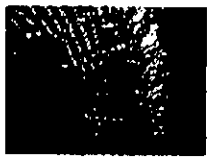
1611 Maui Electric 173 windings being cleaned NDE

1611 Maui Electric 174 windings being cleaned DE

1611 Maui Electric 175 stator core cleaning in pro...

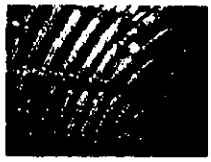
1611 Maui Electric 176 earth ground connection found b...


1611 Maui Electric 177 windings after cleaning NDE


1611 Maui Electric 178 windings after cleaning NDE

1611 Maui Electric 179 stator core after cleaning...

1611 Maui Electric 180 windings after cleaning NDE


1611 Maui Electric 182 windings after cleaning NDE

1611 Maui Electric 183windings after cleaning...

1611 Maui Electric 184 NDE retaining ring Boroscope

1611 Maui Electric 185 NDE retaining ring Boroscope

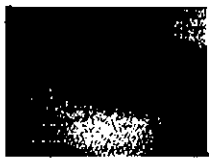
1611 Maui Electric 186 NDE retaining ring Boroscope

1611 Maui Electric 187 NDE retaining ring Boroscope

1611 Maui Electric 188 NDE retaining ring Boroscope

1611 Maui Electric 189 NDE retaining ring Boroscope

1611 Maui Electric 190 NDE retaining ring Boroscope

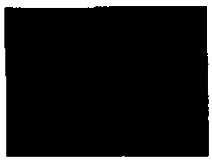

1611 Maui Electric 191 retaining ring Boroscope

1611 Maui Electric 193 NDE retaining ring Boroscope

1611 Maui Electric 194 NDE retaining ring Boroscope

1611 Maui Electric 195 NDE Retaining ring Boroscope

1611 Maui Electric 196 NDE retaining ring Boroscope


1611 Maui Electric 197 NDE retaining ring Boroscope

1611 Maui Electric 198 NDE retaining ring Boroscope

1611 Maui Electric 199 NDE retaining ring Boroscope

1611 Maui Electric 200 NDE retaining ring Boroscope

1611 Maui Electric 201 NDE retaining ring Boroscope

1611 Maui Electric 220

1611 Maui Electric Blocking of rails 230

1611 Maui Electric lowering rotor unto flatbed 236

1611 Maui Electric placing rotor inside MECO shop 253

1611 Maui Electric positioning rotor for loading...

1611 Maui Electric rotor being placed on flatbed 210

1611 Maui Electric rotor loaded on skid rails 252

1611 Maui Electric rotor ready for repairs 251

1611 Maui Electric Rotor Removal 202

1611 Maui Electric rotor safely placed on skid rails...

1611 Maui Electric rotor table set-up 224

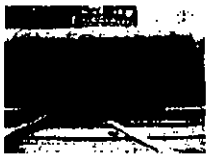
1611 Maui Electric shimmimg of rails 229

1611 Maui Electric table set-up225

1611 Maui Electric Blocking of rails 231

1611 Maui Electric Blocking of rails 232

1611 Maui Electric blocking of rails 233


1611 Maui Electric Blocking of rotor for relocation 237

1611 Maui Electric Landing rotor on skid rails 249

1611 Maui Electric off loading rotor 245

1611 Maui Electric Off loading rotor 246

1611 Maui Electric Placing rotor on rails 248

1611 Maui Electric Placing rotor unto rails 247

1611 Maui Electric positioning of rotor blocks...

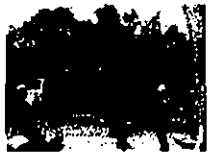
1611 Maui Electric Preparing to load rotor 208

1611 Maui Electric rails for placing of rotor for repairs 24

1611 Maui Electric repostioning rotor 211

1611 Maui Electric repostioning rotor 214

1611 Maui Electric rotating rotor 213


1611 Maui Electric rotor being placed on flatbed 217

1611 Maui Electric Rotor being placed on flatbed 238

1611 Maui Electric rotor being placed on flatbed 209

1611 Maui Electric rotor being repostioned 212

1611 Maui Electric rotor in shop 254

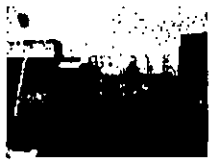
1611 Maui Electric rotor loaded on flatbed 240

1611 Maui Electric Rotor On Slings 204

1611 Maui Electric rotor placed on flatbed 221

1611 Maui Electric rotor ready for relocation 239

1611 Maui Electric rotor ready for relocation 241


1611 Maui Electric rotor ready for relocation 242

1611 Maui Electric rotor ready for relocation 243

1611 Maui Electric Rotor Removal 203

1611 Maui Electric rotor removal blocking 223

1611 Maui Electric rotor removed from skid 222

1611 Maui Electric Rotor Reoval on slings 205

1611 Maui Electric Rotor repositioned successfully...

1611 Maui Electric rotor rotated 216

1611 Maui Electric rotor strapped for relocation 238

1611 Maui Electric Rotor swinging into position 208

1611 Maui Electric shimming of rails 226

1611 Maui Electric shimming of rails 227

1611 Maui Electric shimming of rails 228

1611 Maui Electric Swingin rotor into position 207

1611 Maui Electric Trolley System 234

National Mechanical Services, Inc.

SERVICES PROVIDE TO

MAUI ELECTRIC COMPANY LIMITED
210 W KAMEHAMEHA AVE, KAHULUI, HI 96732

Project Supervisor: Sergio Guerrero

Reviewed and released by: William da Silva

1640B Hoover Avenue, National City, CA 91950
Phone - 619-477-1991, Fax – 619-477-1994
info@natlmech.com

Period of Performance:	September 30th & October 1st, 2005
Location:	Maui, Hawaii
Purpose:	Bearing and seal inspection on the drive end only.
Persons Contacted:	John Mauri
Persons Performing:	Bill da Silva, Sergio Guerrero and Rocky Zamarripa.
Unit Description:	Mfg. Brush Model Number: BDAX 7-167-E Serial Number: 61314A-SG KWA: 29556 Volts: 13800 Date: 1990

1640B Hoover Avenue, National City, CA 91950
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Friday
September 30th, 2005

National Mechanical Services arrived on site at 7am and attended a safety training meeting led by sight personnel. NMS then proceeded to sign in and follow lockout tag out procedures to begin work.

NMS began with a visual inspection of the unit and found that the drive end oil seals were leaking, ten gallons of oil on the non-drive end, contamination within the unit, the attached lube oil pump leaking on the non-drive end and behind the inner shields oil was leaking through the screens. The diode ring assembly was visually inspected as well and was determined to be satisfactory. This unit is very contaminated with environmental air born contaminates and lube oil from the leaking seals.

NMS removed the oil from the non drive end using lint free rags to reduce further contamination when opening the bearing and seals housing.

NMS removed the coupling guard, access covers, quad covers, seal housing assembly and bearing cap. NMS lifted the rotor to facilitate the removal of the drive end bearing, after removal of bearing cap, prior to removal of the bearing. It was found that the bearing remote temperature detector required replacement (NMS supplied). It was further noted that the prior contractor had left a RTD in the sump. NMS removed.

The drive end bearing was cleaned and inspected. The bearing was found to have a heavy wear pattern from the shaft rub. This was determined to normal based on the run time of this unit. It is recommended that during the next overhaul this bearing be replace or rebuilt.

NMS used micrometers to measure the diameters of the drive end bearing and old seals to determine if they were within tolerances. The bearing was found to be within tolerances and was cleaned for reinstallation.

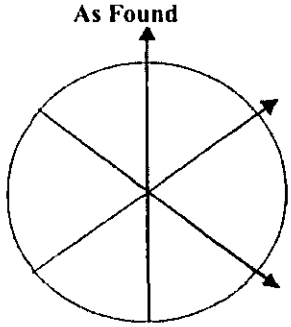
After inspection of seals it was determined that the seal numbers four and five were outside of tolerances. This was presented to the O and M manager John Mauri. These seals were replace by OEM specified seals and furnished by NMS.

NMS found that that drive end sight glass frame had a crack down the center of it. The site was notified.

DRIVE END BEARING

Size: 10" Journal Bearing

As Found



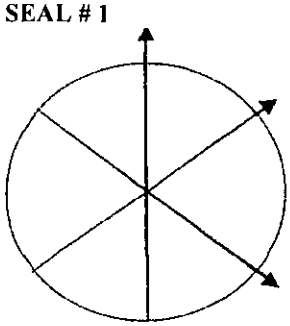
A: 10.0165

B: 10.016

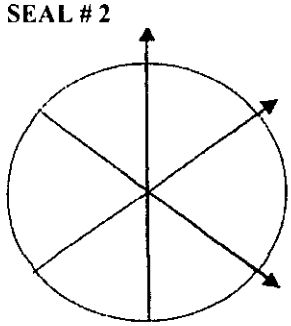
C: 10.016

SEAL DIMENSION REPORT – DRIVE END (AS FOUND)

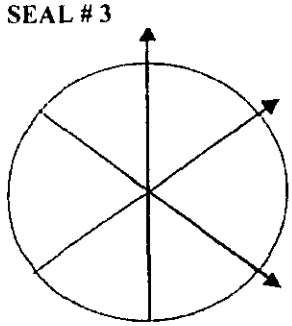
SEAL # 1



SEAL # 2



SEAL # 3



1640B Hoover Avenue, National City, CA 91950
Phone - 619-477-1991, Fax – 619-477-1994
info@natlmech.com

A: 11.513

B: 11.514

C: 11.513

A: 11.515

B: 11.511

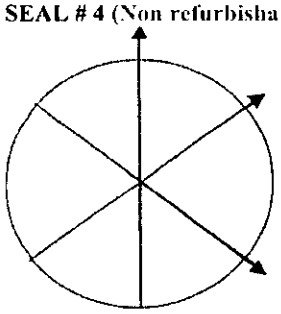
C: 11.513

A: 11.512

B: 11.514

C: 11.512

SEAL # 4 (Non refurbishable)

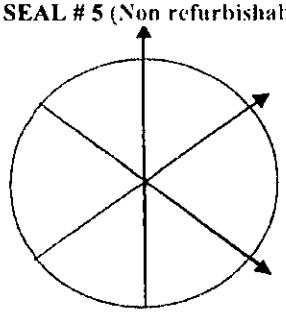


A: 11.518

B: 11.523

C: 11.517

SEAL # 5 (Non refurbishable)



A: 11.518

B: 11.530

C: 11.520

DATA TAKEN BY: Sergio Guerrero

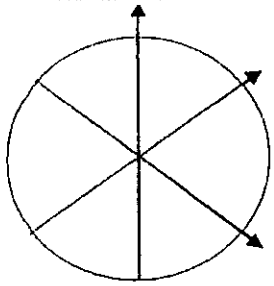
1640B Hoover Avenue, National City, CA 91950
Phone - 619-477-1991, Fax – 619-477-1994
info@natlmech.com

Saturday
October 1st, 2005

National Mechanical Services arrived on site at 6am, proceeded to sign in and follow lockout tag out procedures.

NMS cleaned all parts removed during disassembly and the bearing dimensions were measured again using a micrometer prior to reinstallation.

As Installed



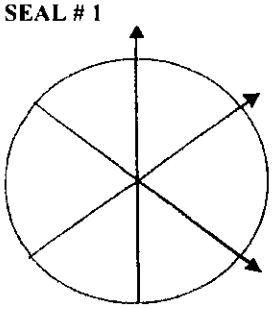
A: 10.0165

B: 10.016

C: 10.016

SEAL DIMENSION REPORT – DRIVE END (AS RELEASED)

SEAL # 1

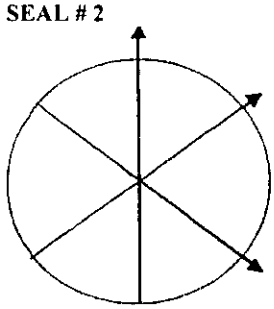


A: 11.513

B: 11.514

C: 11.513

SEAL # 2



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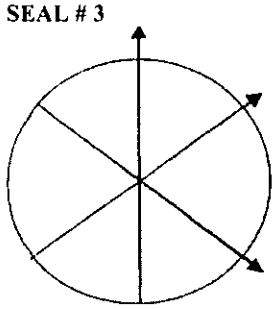
B: 11.511

C: 11.513

SEAL # 3



A: 11.512

B: 11.514

C: 11.512

SEAL # 4

SEAL # 5

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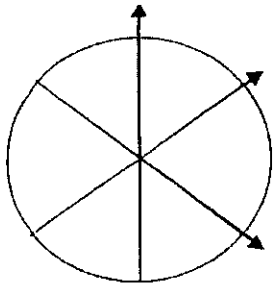

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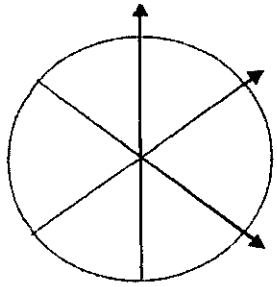
B: 11.511

C: 11.515



A: 11.513

B: 11.512

C: 11.514

DATA TAKEN BY: Sergio Guerrero

NMS proceeded to reassemble the drive end by installing the bearing and perform a twist and tilt check. The lead readings were 0.017 on the inner and 0.0165 on the outer, and the twist was 0.006 on all four corners. The results of this check are well within OEM specification and no further adjustments required. After completion of the bearing a visual inspection was performed to ensure quality of installation.

The bearing cap, seal housing assembly, quad covers, access covers and coupling guard were then installed.

Conclusion:

The maintenance procedures performed by NMS was a complete success, however NMS would like to note the below recommendations.

Recommendations:

NMS is recommending as strongly as we can that this facility schedule a complete overhaul that includes a deep hand cleaning of the inside and outside of this generator. Additionally a cleaning of the interior of the package should be completed as soon as possible to help reduce air born contamination.

The internal state of cleanliness is rapidly deteriorating and reducing the longevity of this unit. If Action is not taken to remedy this condition this unit is heading for catastrophic failure due to heat build up and insulation break down.

Continue to schedule and conduct routine maintenance as outlined by the OEM for the unit as this would greatly benefit the reliability and output.

M14 GENERATOR INSPECTION/CLEANING
MONTHLY SUMMARY OF EXPENSES

Costs Edit View Tools Help

District Code: NECO MAUI ELECTRIC COMPANY, LTD

Project No G0014332 2007-M14 Overhaul-Generator Cleaning

Costs by Subproject | Costs by Period | Costs by Category | Category Costs by Period

Grid | Graph

	Period	Actual Cost (Total)	Estimated Costs	Actual Revenue	Estimated Revenue
1	06/07	$16,341.12	$0.00	$0.00	$0.00
2	07/07	$171,708.29	$0.00	$0.00	$0.00
3	08/07	$9,912.65	$0.00	$0.00	$0.00
4	09/07	$210,531.79	$0.00	$0.00	$0.00
5	TO 7/07	$410,493.85	$0.00	$0.00	$0.00
6	TOTAL:	$410,493.85	$0.00	$0.00	$0.00

Selection | Select Display Cost: Direct / Total | Type: Bar - Depth | Color: Actual Cost (Total)

4 matches

Date Printed	26 September 2007 17 15 52
Eclipse User id	hung
Program Name	msq660.exe
Program Description	MSQ660 - Projects
Version	ABE
Revision	50 $ Date: Thursday, August 03, 2006
Module	3660
Product Version	5.2.3.2
File Version	5.2328.0.50
Location	D:\Program Files\Mincom\WIMS Open Enterprise\5.2.3.2\Bin\
Compiled Date	15 August 2006 10 41
Form Name	frmWim68007GridGraph8

M14 GENERATOR INSPECTION/CLEANING
MONTHLY EXPENSES BY EXPENSE ELEMENTS

Costing (MAUI ELECTRIC COMPANY, LTD.)

Costs Edit View Tools Help

District Code: MECO MAUI ELECTRIC COMPANY, LTD.

Project No: G0014332 2007-M14 Overhaul-Generator Cleaning

Costs by Subproject | Costs by Period | Costs by Category | Category Costs by Period

Grid | Graph

	Category Code	Category Desc	More	06/07	07/07	08/07	09/07
1	LABOR	DIRECT LABOR COSTS	NO	$7,462.54	$2,382.35	$0.00	$2,164.66
2	MATERIAL	MATERIAL COSTS	NO	$4,802.49	$6,308.04	$0.00	($3,213.11)
3	O/S SVCS	OUTSIDE SERVICES	NO	$630.20	$161,279.58	$9,912.65	$210,122.08
4	OVERHEADS	OVERHEAD COSTS	NO	$5,445.89	$1,738.32	$0.00	$1,458.16
5	TOTE	Exp Total		$18,341.12	$171,708.29	$9,912.65	$210,531.79
6	TOTAL:	Total		$18,341.12	$171,708.29	$9,912.65	$210,531.79

Selection | Select Display Cost: Direct / Total | Type: Bar - Depth | Color: DIRECT LABOR COSTS

4 matches

Date Printed	26 September 2007 17:16:04
Eclipse Userid	hung
Program Name	msq660.exe
Program Description	MSQ660 - Projects
Version	ABE
Revision	50 $ Date: Thursday, August 03, 2006
Module	3660
Product Version	5.2.3.2
File Version	5.2328.0.50
Location	D:\Program Files\Mincom\MIMS Open Enterprise\5.2.3.2\Bin\
Compiled Date	15 August 2006 10:41
Form Name	frmMsq660076indGraph8

Invoice

National Mechanical Services, Inc.
1640 B Hoover Ave
National City, CA 91950
619-477-1991
info@natlmech.com

AP RCVD MAY 3 '07 AM 8:51

Date	Invoice #
4/26/2007	07-1611

Bill To
Maui Electric Company Limited P.O. Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

25400

USE TAX

P.O. No.	Terms	Project
M33298	Due on receipt	1611-rotor pull

Quantity	Description	Rate	Amount
	35% deposit upon acceptance of your purchase order NMS Job Quote 05-1611R2	48,023.85	48,023.85
	Sales Tax	7.75%	0.00
		Total	$48,023.85

National Mechanical Services, Inc.

P.O. Box 385
National City, CA 91951
619-477-1991
info@natlmech.com

Invoice

Date	Invoice #
6/7/2007	07-1611-1

Bill To
Maui Electric Company Limited P.O. Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

APRCVD JUL 6 '07 AM 9 3

P.O. No.	Terms	Project
M33298	Net 30	1611-rotor pull

Quantity	Description	Rate	Amount
	35% upon removal of the rotor at your facility at Maui Electric.	48,023.85	48,023.85
	Sales Tax	7.75%	0.00
	USE TAX		
		Total	$48,023.85

National Mechanical Services, Inc. AP RCVD AUG 6 '07 AM 8:52

Invoice

P.O. Box 385
National City, CA 91951
619-477-1991
info@natlmech.com

Date	Invoice #
8/2/2007	07-1611-6

Bill To
Maui Electric Company Limited P.O. Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

M33298 LI

P.O. No.	Terms	Project
~~M24202~~	Net 30	1611-rotor pull

Quantity	Description	Rate	Amount
	Balance on remaining contract, 30%	41,163.30	41,163.30
	Settlement Costs	23,322.00	23,322.00
	Additional Lite off days 7/18/07 to 7/19/07	1,830.00	1,830.00
	Stand By costs while waiting for generator to lite off	9,720.00	9,720.00
	Sales Tax	7.75%	0.00
		Total	$76,035.30

USE TAX

AGT SERVICES Inc.
24 Sam Stratton Road
Amsterdam, NY 12010
(518) 843-1112 phone
(518) 843-8389 fax

Invoice

Date	Invoice #
7/12/2007	2007-133

Bill To
Maui Electric Company, LTD PO Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

USE TAX

P.O. No.	Terms
M33941	Net 30

Qty	Description	Rate	Amount
	Maalaea M14 RR Removal		
	Labor as per AGT Services 2007 Rates		
64	Specialist labor, straight time	180.00	11,520.00
27.5	Specialist labor, over time	270.00	7,425.00
64	Lead winder labor, straight time	130.00	8,320.00
23.5	Lead winder labor, over time	195.00	4,582.50
110	Winder labor, travel time	105.00	11,550.00
96	Winder labor, straight time	105.00	10,080.00
61	Winder labor, over time	157.50	9,607.50
	Expenses @ cost + 10%		
1.1	Expense Account Charges - Benson	2,840.85	3,124.94
1.1	Expense Account Charges - Carlone	2,511.62	2,762.78
1.1	Expense Account Charges - Hughes	4,220.22	4,642.24
1.1	Expense Account Charges - Miller	4,085.18	4,493.70
1.1	Expense Account Charges - Dufel	4,826.28	5,308.91
	Expendables @ cost + 20%		
1.2	AGT Services in-stock expendables (itemized list attached)	1,212.68	1,455.22
	Materials @ cost + 20%		
1.2	AGT Services in-stock materials (itemized list attached)	1,151.30	1,381.56
	Equipment Rental @ cost + 15%		
1.15	Equipment Rental - Induction Heater (Mannings)	10,487.35	12,060.45
	Reverse-engineered materials @ cost + 30%		
1.3	RR Insulation (Gund)	1,589.04	2,065.75

Thank you for your business.

Total

If applicable, additional labor and/or materials, approved to be billable on a T&M basis, to follow under separate invoice

APRCVD JUL 18 '07 AM 8:25

AGT SERVICES Inc.
24 Sam Stratton Road
Amsterdam, NY 12010
(518) 843-1112 phone
(518) 843-8389 fax

Invoice

Date	Invoice #
7/12/2007	2007-133

Bill To
Maui Electric Company, LTD PO Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

P.O. No.	Terms
M33941	Net 30

Qty	Description	Rate	Amount
	Freight @ cost + 15%		
1.15	Freight to pick up cable (Shaker)	975.57	1,121.91
1.15	Freight to ship RR Tool and Equipment to Maui (Seko)	6,410.00	7,371.50
1.15	Freight to ship tools and equipment back to Amst (Target)	6,897.00	7,931.55
1.15	Freight to ship expendables / materials (Fedex)	568.26	653.50
1	Test Box Rental	600.00	600.00
1	Field Repair Tooling Rental	600.00	600.00
1	Induction Heater Cable Rental	500.00	500.00

Thank you for your business.

Total $119,159.01

If applicable, additional labor and/or materials, approved to be billable on a T&M basis, to follow under separate invoice

AGTSERVICES Inc.

AP RCVD AUG 2 '07 AM 9:06

24 Sam Stratton Road
Amsterdam, NY 12010
(518) 843-1112 phone
(518) 843-8389 fax

Invoice

Date	Invoice #
7/19/2007	2007-137

Bill To
Maui Electric Company, LTD PO Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

P.O. No.	Terms
M33941	Net 30

Qty	Description	Rate	Amount
	Additional Invoice for Materials on Maui Maalaea RR Removal		
	Reverse-engineered materials @ cost + 30%		
1.3	G-11 Centering Ring Assembly	1,803.38	2,344.39
	USE TAX		
	Thank you for your business.	**Total**	$2,344.39

If applicable, additional labor and/or materials, approved to be billable on a T&M basis, to follow under separate invoice

AGT SERVICES Inc.

24 Sam Stratton Road
Amsterdam, NY 12010
(518) 843-1112 phone
(518) 843-8389 fax

Invoice

Date	Invoice #
7/12/2007	2007-134

Bill To
Maui Electric Company, LTD PO Box 2750 Honolulu, HI 96840-0001 Attn: Accounts Payable

P.O. No.	Terms
M33297	Net 30

Qty	Description	Rate	Amount
	Testing performed at Maalaea M14		
	Labor as per AGT Services 2007 Rates		
74	Specialist labor, travel	180.00	13,320.00
16	Specialist labor, straight time	180.00	2,880.00
18	Specialist labor, over time	270.00	4,860.00
	Expenses @ cost + 10%		
1.1	Expense Account - Benson	3,666.39	4,033.03
1.1	Expense Account - Carlone	3,558.58	3,914.44
	Freight @ cost + 15%		
1.15	Freight to ship Test Equipment (Shaker)	1,670.86	1,921.49
1	Test Box Rental	600.00	600.00
1	Elcid Rental	350.00	350.00

USE TAX

APPRCVD JUL 18'07 AM 8:25

Thank you for your business.

Total $31,878.96

If applicable, additional labor and/or materials, approved to be billable on a T&M basis, to follow under separate invoice

CA-IR-434

Ref: MECO Response to CA-IR-2, MECO T-9, Attachment R, RA=PSM, page 73 (RSAT Survey Billables).

Please provide the following:

a. Explain the purpose of the referenced RSAT Survey and provide specimen work product resulting from such efforts.

b. Monthly actual expenditures in 2006 and 2007 to-date for RSAT Survey Billables.

c. Explain any significant differences between actual and planned test year levels of activity regarding RSAT Survey work.

MECO Response:

a. The RSAT Survey is the Residential Customer Survey used to track and measure customer satisfaction with respect to MECO's various attributes. The scope of the survey is to track and measure consumer attitudes with respect to attributes such as MECO's management of responses to power outages and restoration efforts, community contributions, advertising awareness, customer loyalty, company honesty and integrity, and consumer awareness of various energy efficiency programs.

The requested copy of the work product is voluminous and is available for inspection at HECO's Regulatory Affairs Division office, Suite 1301, Central Pacific Plaza, 220 South King Street, Honolulu, Hawaii. Please contact Dean Matsuura at 543-4622 to make arrangements to inspect the requested information.

b. The requested information is provided in Attachment A, subject to Protective Order No. 23379 because the financial information is confidential until publicly disclosed in HECO's Form 10-Q financial statements or when the Consumer Advocate submits its testimony in this proceeding, which is scheduled for October 25, 2007.

c. There are no significant differences between actual and estimated test year levels of activity related to RSAT survey work. The Company's test year 2007 expense estimate assumed that the Residential Customer Satisfaction survey would be performed twice in the test year and MECO has already conducted the survey twice in 2007. However, because the year-end detailed survey and report for MECO was completed in late September 2007, the year-to-date August 2007 expenditures for this work provided in the response to part b. above does not fully reflect all of the expenses expected to be recorded in the test year.

WARD RESEARCH
INCORPORATED

2007 RESIDENTIAL CUSTOMER SURVEY

MAUI ELECTRIC COMPANY

Survey of Maui Customers

September 2007

828 FORT STREET MALL, SUITE 210 • HONOLULU, HAWAII 96813 • TELEPHONE: (808) 522-5123 • FAX: (808) 522-5127

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EXECUTIVE SUMMARY

Residential Customer Ratings of MECO

- MECO's customer satisfaction rating rose 1.4 points to 78.7% in 2007. MECO outperformed Hawaiian Telcom/Verizon Hawaii on this measure for the 14th consecutive year. MECO also increased its lead over Hawaiian Telcom/Verizon Hawaii from 9.5 points in 2006 to 10.6 points in 2007.

- MECO's overall performance (corporate image) rating dipped 0.5 points (76.2% - down from 76.7% in 2006), while corresponding ratings for Hawaiian Telcom/Verizon Hawaii fell 1.3 points (68.7% - down from 70.0%). This is the 8th consecutive year that MECO has outperformed Hawaiian Telcom/Verizon Hawaii on this measure.

- MECO's ratings across six of the eight image categories tested increased since one year ago. The largest increases came in ratings for accurate billing (83.0% - up 3.4 points), low cost (42.1% - up 2.5 points), and reliable service (80.7% - up 2.1 points). The decreases came in ratings for fast recovery after storms (75.0% - down 1.9 points) and fast response to trouble calls (75.4% - down 1.0 points).

- MECO received its highest ratings from Maui residential customers in terms of accurate billing (83.0% - up 3.4 points), friendly employees (81.8% - up 0.1 point), and reliable service (80.7% - up 2.1 points). The lowest rating MECO received from its customers continues to be for low cost (42.1% - up 2.5 points).

- MECO outperformed Hawaiian Telcom/Verizon Hawaii in all but two of the eight image categories: low cost (a gap of 9.8 points) and uninterrupted service (a gap of 0.4 points).

MECO in the News

- Nearly nine out of ten respondents (86.7% - up 9.9 points) said that they could <u>not</u> recall any recent stories in the news concerning MECO. Those who did recall seeing or hearing a news story mentioned the ad messages on renewable energy (4.4%) and the wind farms pilot project (2.2%) most often.

- Recall of MECO's advertising increased for the 3rd consecutive year (42.5% - up 2.5 points). Advertising messages relating to conservation of energy (29.7% - up 6.4 points) and other types of energy (11.7% - down 15.0 points) were recalled most often.

- More than one-third of all respondents said that they are aware of recent cost savings and informational programs offered by MECO (36.5% - down 2.2 points). Among these, one in four offered that they are aware of the solar rebate program (24.3% - down 3.4 points) --- more than any other program.

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About MECO's Services

- When respondents were asked to name the one thing that MECO does that is most beneficial to the community, nearly one-half said they did not know (46.8% - up 11.8 points). Community projects and events sponsorship (11.0% - down 2.0 points) was the second most popular answer, followed by alternate energy sources (9.6% - down 4.7 points).

- Maui residents displayed greater support for their Molokai and Lanai neighbors than they did in the past, with one in five indicating their willingness to share the higher costs of electricity paid by Molokai and Lanai customers (20.3% - up 5.0 points). Nearly three in four (72.7% - up 7.3 points) of those who would consider sharing the costs or don't know (36.6% - up 9.6 points) are willing to pay at least a 2% increase or about $3.90 more on a typical monthly bill.

- Nearly one-half of those responding (47.8% - up 5.1 points) said that they would be willing to pay more on their electric bill if the electric company would do more to develop and use environmentally friendly energy sources. Among these, approximately one-half (48.6% - down 3.0 points) said that they are willing to pay at least $10 or more.

- The proportion of respondents indicating that the power had gone off in their neighborhood in the past six months fell 2.7 points to 63.5% in 2007. Of that group, 79.1% (down 1.8 points) indicated that they are satisfied with how MECO handled the problem.

- When asked to think about the possibility of having a choice of electricity providers, nearly three-fifths (58.4% - down 0.9 points) indicated that they would consider an alternative or did not know, while less than one-half (41.6 - up 0.9 points) said that they would remain loyal to MECO.

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SUMMARY OF FINDINGS

GENERAL REMARKS

The findings presented in this report are based on telephone surveys conducted with Maui residential customers. When applicable, comparable data from previous surveys were used to illustrate trends or significant changes that have occurred over time. Also when applicable, results from an abbreviated quarterly survey of 151 respondents have been combined with the complete year-end survey of 301 respondents to give a time-weighted average for the year. For detailed data tables, please refer to Appendix C.

NAME AWARENESS

As in the past, respondents were asked questions relating to name and advertising awareness of companies that provide basic services in Hawaii. These questions are intended to assess how prominently the Maui Electric Company (MECO) name is held in the mind of the residential customer.

In 2007, slightly fewer respondents expressed awareness of the MECO name than in previous years (98.6% - down 1.4 points). Additionally, top-of-mind awareness of MECO decreased 4.5 points (46.8% - down from 51.3%). Despite the decrease, top-of-mind awareness of MECO remains far higher than of Hawaiian Telcom/Verizon Hawaii (9.6% - down 6.7 points) and Gasco/The Gas Company (2.0% - up 0.7 points).

Table 1
Name Awareness of Hawaii's Basic Service Providers

When you think of large companies that provide basic services to Hawaii's residents, which ones come to mind?	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Maui Electric										
Top-of-mind	47.1%	50.0%	47.7%	60.7%	66.0%	54.2%	55.9%	50.7%	51.3%	46.8%
Other unaided	21.0%	20.7%	16.0%	19.0%	15.0%	15.0%	16.4%	17.7%	19.7%	14.6%
Aided awareness	31.6%	29.3%	36.0%	20.3%	18.3%	30.6%	27.6%	31.3%	29.0%	37.2%
Not heard of	0.3%	0.0%	0.3%	0.0%	0.7%	0.3%	0.0%	0.3%	0.0%	1.3%
Hawaiian Telcom/Verizon Hawaii										
Top-of-mind	27.1%	25.0%	20.7%	21.3%	14.7%	18.6%	16.1%	13.7%	16.3%	9.6%
Other unaided	28.4%	28.3%	26.3%	34.3%	38.0%	19.3%	28.0%	34.7%	33.7%	26.9%
Aided awareness	44.2%	45.0%	51.7%	42.7%	47.0%	61.1%	55.3%	50.7%	48.3%	57.1%
Not heard of	0.3%	1.7%	1.3%	1.7%	0.3%	1.0%	0.7%	1.0%	1.7%	6.3%
Gasco/Gas Company (net)										
Top-of-mind	1.3%	1.0%	1.0%	0.0%	1.0%	2.0%	0.7%	0.7%	1.3%	2.0%
Other unaided	3.9%	3.7%	6.0%	3.0%	6.0%	3.0%	4.3%	5.3%	5.7%	4.3%
Aided awareness	75.8%	75.7%	73.3%	62.7%	61.3%	65.1%	74.7%	74.7%	72.0%	76.4%
Not heard of	19.0%	19.7%	19.7%	34.3%	31.7%	29.9%	20.4%	19.3%	21.0%	17.3%

[Note: Since the 2001 survey, a mention of either Gasco or The Gas Company has been counted as one mention of Gasco/The Gas Company. Since 2005, a mention of either Verizon Hawaii or Hawaiian Telcom was counted as one mention of Hawaiian Telcom/Verizon Hawaii.]

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RECENT STORIES IN THE NEWS OF MECO

In 2007, recall of news stories concerning the utility decreased 9.9 points to 13.3%, following a 15.2 points increase from the previous year. When asked, "What have you seen or heard?", "renewable ad messages" (4.4%) and "pilot for wind farms" (2.2% - down 5.5 points) were the news items mentioned most often by these respondents.

Table 2
Recent News Stories on MECO

Have there been any recent stories in the news concerning Maui Electric that come to mind?	2001 Annual		2002 Annual		2003 Annual		2004 Annual		2005 Annual		2006 Annual		2007 Annual	
Yes	67	14.9%	55	12.2%	80	17.7%	34	7.5%	36	8.0%	105	23.2%	60	13.3
No/Don't know	383	85.1%	395	87.8%	371	82.3%	420	92.5%	414	92.0%	347	76.8%	392	86.7
IF YES What have you seen or heard?	Mult Rspn	% of all Rspnd	Mult Rspn	% of all Rspnd	Mult Rspn	% of all Rspnd	Mult Rspn	% of all Rspnd	Mult Rspn	% of all Rspnd	Mult Rspn	% of all Rspnd	Mult Rspn	% of all Rspnd
Renewable ad messages	---	---	---	---	---	---	---	---	---	---	---	---	20	4.4%
Pilot for Wind Farms	3	0.7%	0	0.0%	0	0.0%	0	0.0%	6	1.3%	35	7.7%	10	2.2%
Rate Increase	9	2.0%	5	1.1%	51	11.3%	7	1.5%	7	1.6%	4	0.9%	7	1.5%
Interest in biofuels at plant	---	---	---	---	---	---	---	---	---	---	---	---	6	1.3%
Plant Addition/Expansion	39	8.7%	18	4.0%	33	7.3%	9	2.0%	1	0.2%	2	0.4%	5	1.1%
Power Outages	6	1.3%	7	1.6%	11	2.4%	7	1.5%	1	0.2%	6	1.3%	3	0.7%
Energy Savings/Programs	3	0.7%	2	0.4%	9	2.0%	4	0.9%	2	0.4%	56	12.4%	1	0.2%
Power Lines	3	0.7%	17	3.8%	12	2.7%	2	0.4%	2	0.4%	3	0.7%	0	0.0%
Other	10	2.2%	10	2.2%	3	0.7%	8	1.8%	20	4.4%	9	2.0%	15	3.3%
Don't know	3	0.7%	3	0.7%	4	0.9%	4	0.9%	1	0.2%	2	0.4%	5	1.1%

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ADVERTISING AWARENESS AND MESSAGE RECALL

Advertising awareness of MECO increased for the 3rd consecutive year. In 2007, 42.5% (up 2.5 points) said that they remember some type of ad for MECO. Of that group, however, 36.0% (up 2.7 points) were unable to recall any specific advertising content. As in previous years, respondents who did recall specific messages mentioned energy conservation (29.7% - up 6.4 points) and alternative energy sources (11.7% - down 15.0 points) more than any other topic. (See Appendix C - Table C-3).

In comparison, ad awareness of Hawaiian Telcom/Verizon Hawaii decreased 8.1 points to 62.9% (from 71.0% in 2006). Despite this, Hawaiian Telcom/Verizon Hawaii remains the leader in advertising awareness as compared to the other utilities.

Table 3
Advertising Recall of Hawaii's Basic Service Providers

For which companies that provide basic services do you remember seeing or hearing advertising in the past month?	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Maui Electric										
Top-of-mind	7.7%	14.0%	10.3%	11.7%	14.3%	11.3%	13.8%	11.3%	13.3%	12.6%
Other unaided	6.1%	4.7%	7.3%	7.0%	8.3%	4.7%	6.9%	5.7%	5.7%	6.8%
Aided awareness	28.7%	25.3%	22.3%	16.7%	23.7%	27.6%	15.1%	21.3%	21.0%	23.3%
Not heard of	57.4%	56.0%	60.0%	64.7%	53.7%	56.5%	64.1%	61.7%	60.0%	57.5%
Hawaiian Telcom/Verizon Hawaii										
Top-of-mind	27.7%	24.3%	41.3%	43.7%	30.0%	26.9%	23.7%	23.3%	20.3%	14.0%
Other unaided	2.6%	4.3%	4.3%	1.7%	5.3%	3.0%	5.3%	5.0%	7.0%	5.0%
Aided awareness	41.3%	41.0%	32.0%	42.0%	48.7%	54.5%	52.0%	47.0%	43.7%	43.9%
Not heard of	28.4%	30.3%	22.3%	12.7%	16.0%	15.6%	19.1%	24.7%	29.0%	37.2%
Gasco/Gas Company (NET)										
Top-of-mind	1.6%	0.3%	1.0%	0.0%	0.0%	1.0%	0.7%	0.0%	0.3%	1.7%
Other unaided	1.9%	1.0%	0.7%	0.0%	2.0%	0.7%	0.3%	1.0%	1.0%	0.3%
Aided awareness	23.2%	11.0%	12.0%	9.3%	10.0%	10.0%	17.8%	16.0%	16.0%	18.3%
Not heard of	73.2%	87.7%	86.3%	90.7%	88.0%	88.4%	81.3%	83.0%	82.7%	79.7%

[Note: Since the 2001 survey, a mention of either Gasco or The Gas Company has been counted as one mention of Gasco/The Gas Company. Since 2005, a mention of either Verizon Hawaii or Hawaiian Telcom was counted as one mention of Hawaiian Telcom/Verizon Hawaii.]

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TRUST IN LARGE COMPANIES

Respondents were again asked the following question about their level of trust of large companies in Hawaii:

> "Some people feel that large companies are a valuable part of the community - because they provide jobs and provide essential services to our residents. Other people feel that these companies are mostly out for their own profit and can't be trusted to look out for the interests of our residents. Which of these is closest to your opinion?"

- large companies are a valuable part of the community
- or they cannot be trusted

The proportion of respondents who do not trust large companies decreased in 2007. As shown below in Table 4, one in five respondents said that large companies cannot be trusted (21.6% - down 2.4 points). In comparison, more than one-half (54.2% - down 3.8 points) said that large companies are a valuable part of the community; the remaining 24.3% (up 6.3 points) have no opinion or don't know.

Table 4
Level of Trust of Large Companies

What is closest to your opinion?	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Large companies are a valuable part of community	57.4%	62.3%	59.3%	57.0%	55.3%	51.5%	67.1%	62.7%	58.0%	54.2%
They can't be trusted	21.6%	19.7%	22.3%	32.0%	28.3%	17.9%	21.1%	22.0%	24.0%	21.6%
Don't know	21.0%	18.0%	18.3%	11.0%	16.3%	30.6%	11.8%	15.3%	18.0%	24.3%

Respondents were also asked whether or not they trust specific companies doing business in Hawaii. The levels of trust for all companies tested increased in 2007. Maui Electric remained the most trusted partner in the community in 2007 (79.7% - up 2.4 points). Consistent with the year prior, First Hawaiian Bank placed second (70.8% - up 1.1 points), Oceanic Cablevision placed third (62.1% - up 0.1 points), Hawaiian Telcom/Verizon Hawaii placed fourth (60.8% - up 4.1 points), and the Honolulu Advertiser placed last (45.5% - up 3.8 points).

Table 5
Trustworthiness of Selected Hawaii Companies

In particular, do you consider (each company) to be a trusted partner in the community, or do you feel they cannot be trusted?	2003			2004			2005			2006			2007		
	Trusted	Not Trusted	Don't Know	Trusted	Not Trusted	Don't Know	Trusted	Not Trusted	Don't Know	Trusted	Not Trusted	Don't Know	Trusted	Not Trusted	Don't Know
Maui Electric Company	78.7%	10.3%	11.0%	78.6%	14.1%	7.2%	74.0%	14.3%	11.7%	77.3%	14.7%	8.0%	79.7%	14.3%	6.0%
First Hawaiian Bank	57.1%	7.0%	35.9%	73.7%	7.6%	18.8%	62.0%	11.7%	26.3%	69.7%	8.3%	22.0%	70.8%	11.3%	17.9%
Oceanic Cablevision	59.1%	14.3%	26.6%	61.5%	21.4%	17.1%	61.7%	17.3%	21.0%	62.0%	20.0%	18.0%	62.1%	17.3%	20.6%
Hawaiian Telcom/Verizon Hawaii	66.4%	16.6%	16.9%	68.1%	21.1%	10.9%	64.0%	18.3%	17.7%	56.7%	29.3%	14.0%	60.8%	19.9%	19.3%
Honolulu Advertiser	43.2%	5.0%	51.8%	44.7%	10.9%	44.4%	37.7%	10.3%	52.0%	41.7%	10.3%	48.0%	45.5%	8.3%	46.2%

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CREDIBILITY AND INTEGRITY OF MAUI ELECTRIC

Consistent with years prior, customers were more likely to believe MECO's reasons for power outages than they were for rate increases. Three-fourths of all respondents said that the company has been honest when giving reasons for power outages (76.1% - down 2.2 points), while, in comparison, only one-half said that the company has been honest when giving reasons for rate increases (52.2% - up 0.5 points).

Table 6
Credibility and Integrity of Maui Electric

Electric company is honest when they give reasons for increasing rates	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Agree	51.0%	48.0%	54.3%	49.7%	49.3%	53.5%	56.6%	55.7%	51.7%	52.2%
Disagree	35.5%	39.3%	30.7%	34.3%	29.0%	24.9%	32.2%	32.0%	37.7%	30.2%
Don't know	13.5%	12.7%	15.0%	16.0%	21.7%	21.6%	11.2%	12.3%	10.7%	17.6%
Electric company tells the truth when they explain the reasons for power outages										
Agree	72.6%	67.0%	72.7%	74.7%	74.0%	78.1%	79.9%	76.7%	78.3%	76.1%
Disagree	16.5%	19.7%	13.7%	15.3%	11.7%	10.0%	11.5%	12.7%	14.0%	11.6%
Don't know	11.0%	13.3%	13.7%	10.0%	14.3%	14.0%	8.6%	10.7%	7.7%	12.3%

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RATINGS OF UTILITIES

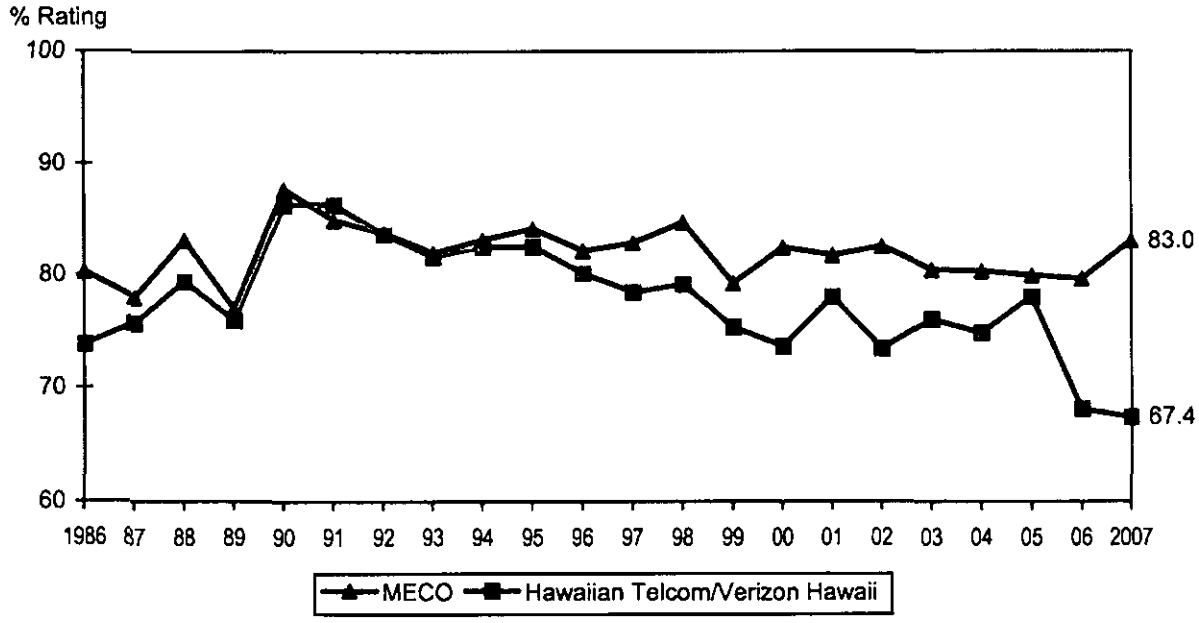
As in the past, respondents were asked to compare MECO with Hawaiian Telcom/Verizon Hawaii on several attributes.

MECO continues to hold advantages over Hawaiian Telcom/Verizon Hawaii across all customer service-related ratings and, in 2007, increased its lead over the communications company on these measures --- accurate billing (a gap of 15.6 points), fast response to trouble calls (12.9 points), friendly employees (7.6 points), and overall performance (7.5 points). Additionally, MECO leads Hawaiian Telcom/Verizon Hawaii in terms of perceived participation in community affairs (a gap of 12.7 points).

On other product-related (electric power) measures, MECO holds advantages over Hawaiian Telcom/Verizon Hawaii with regard to reliable service (a gap of 6.4 points) and fast recovery after storms (1.7 points). However, Hawaiian Telcom/Verizon Hawaii holds advantages over MECO in ratings for low cost (9.8 points) and uninterrupted service (0.4 points).

MECO has consistently outperformed Hawaiian Telcom/Verizon Hawaii for accurate billing since 1992 and, in 2007, increased its lead to 15.6 points (compared to 11.5 points in 2006). As shown below in Figure 1, MECO's rating on this measure increased 3.4 points (83.0% - up from 79.6%) while Hawaiian Telcom/Verizon Hawaii's rating fell 0.7 points (67.4% - down from 68.1%).

Figure 1
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Accurate Billing



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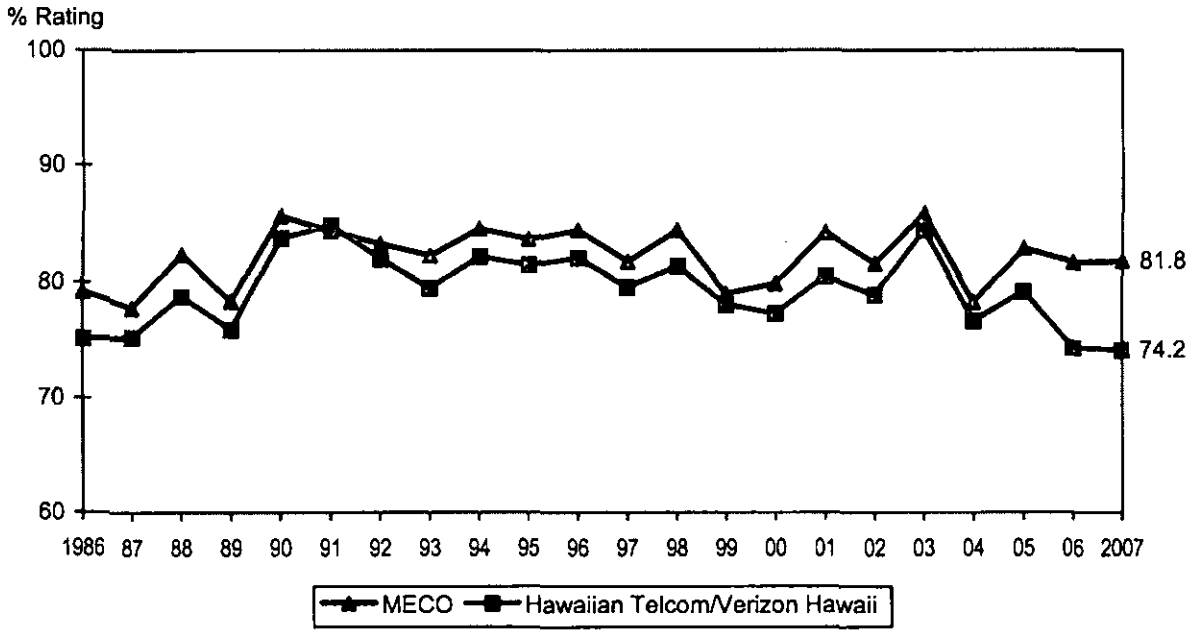
MECO has also outperformed Hawaiian Telcom/Verizon Hawaii for friendly employees since 1992 (Figure 2). Customer ratings for MECO on this measure (81.8% - up 0.1 points) are comparable to 2006, as are corresponding ratings for Hawaiian Telcom/Verizon Hawaii (74.2% - down 0.2 points.)

Figure 2
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Friendly Employees



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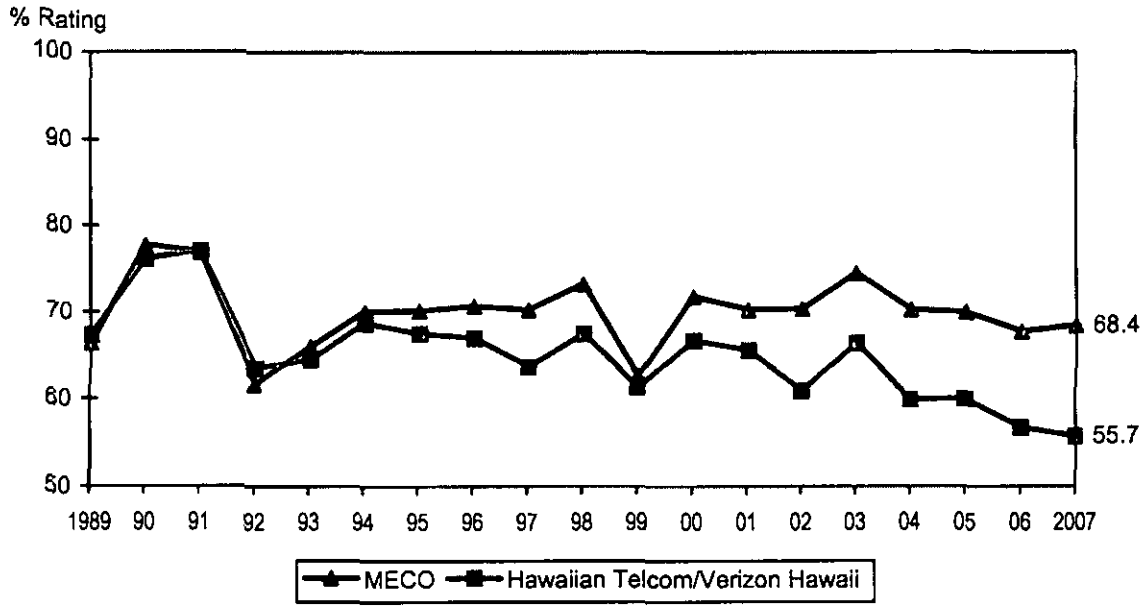
Ratings for both MECO and Hawaiian Telcom/Verizon Hawaii also showed little change from one year ago in terms of participation in community activities (68.4% - up 0.7 points for MECO and 55.7% - down 1.0 points for Hawaiian Telcom/Verizon Hawaii).

Figure 3
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Participating in Community Activities



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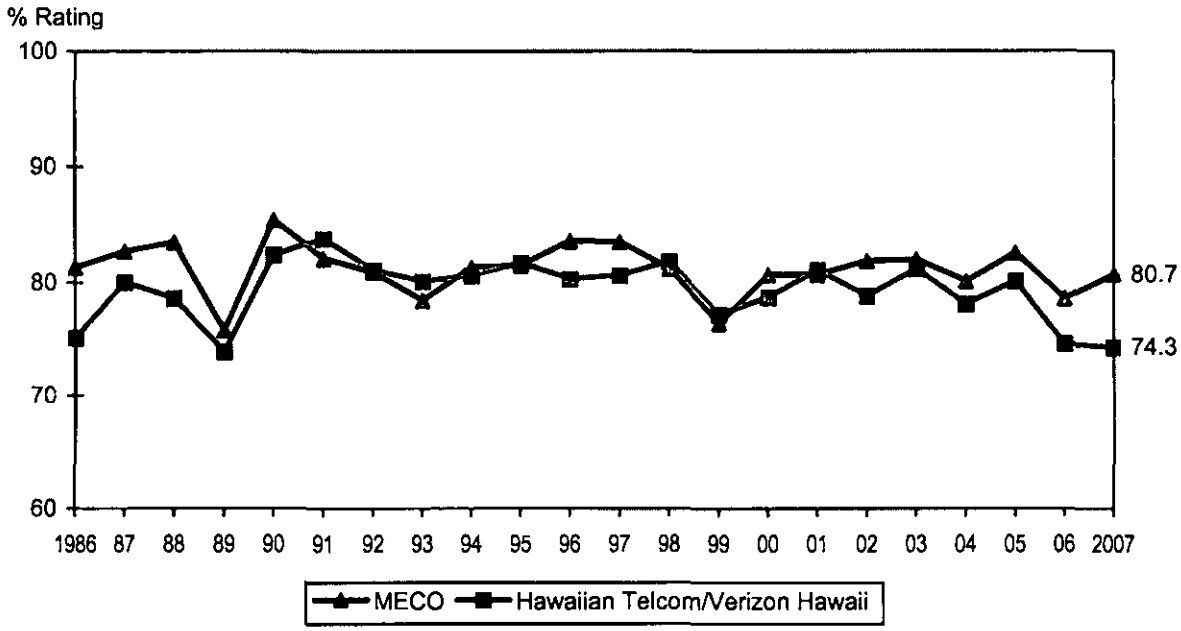
For the fifth consecutive year, customers rated MECO (80.7% - up 2.1 points) more reliable than Verizon Hawaii/Hawaiian Telcom (74.3% - down 0.3 points). Aided by a 2.1 point increase in its own ratings, MECO widened its lead over Verizon Hawaii/Hawaiian Telcom from 4.0 points in 2006 to 6.4 points in 2007.

Figure 4
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Reliable Service



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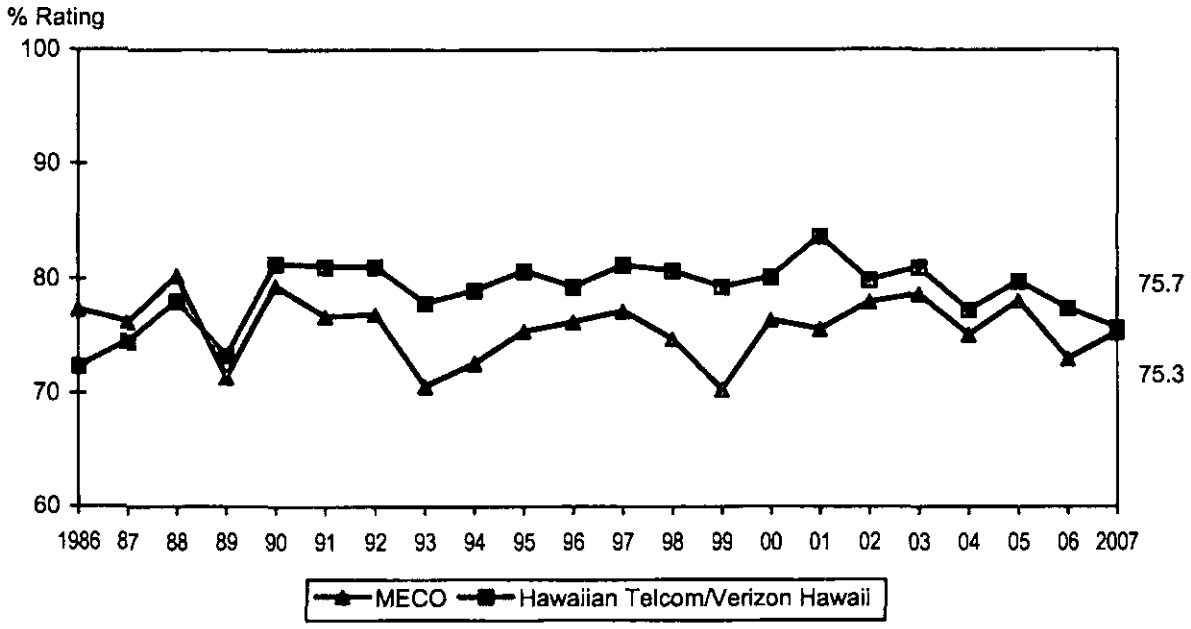
As shown in Figure 5 below, MECO's rating on uninterrupted service has trailed that of Hawaiian Telcom/Verizon Hawaii since 1988. Hawaiian Telcom/Verizon Hawaii maintained a slight edge over MECO (0.4 points compared to 4.4 points in 2006) in 2007, despite a 2.3 points increase in MECO's ratings (75.3% from 73.0%) and a decrease in Hawaiian Telcom/Verizon Hawaii's ratings (75.7% - down 1.7 points).

Figure 5
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Uninterrupted Service



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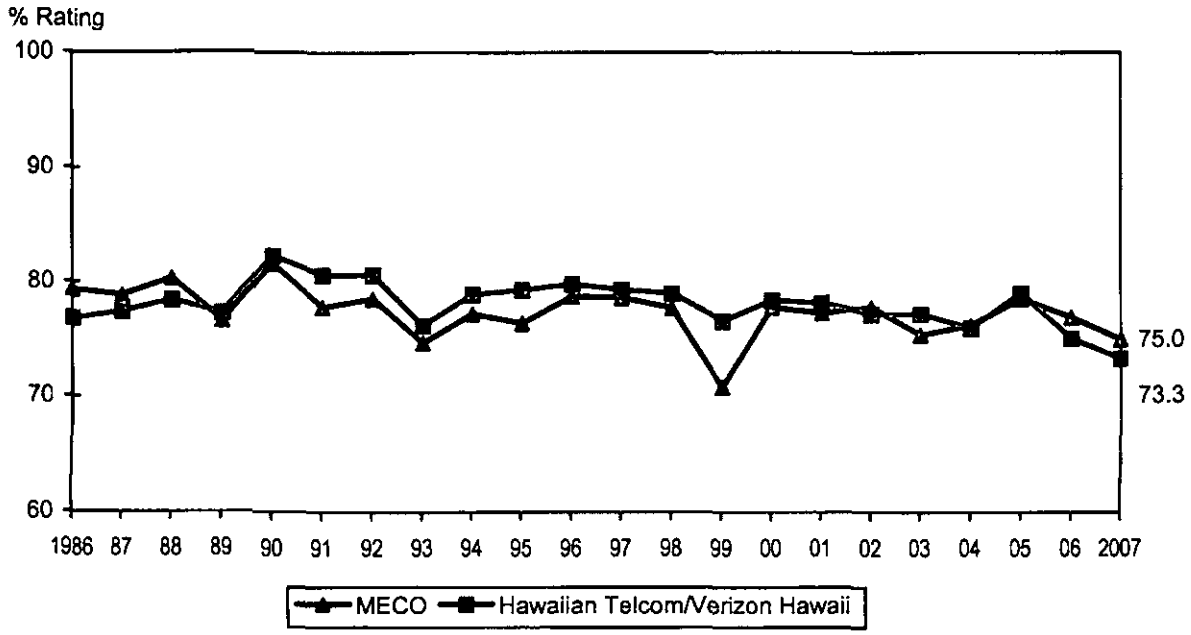
As shown in Figure 6 below, MECO and Hawaiian Telcom/Verizon Hawaii were seen comparably on fast recovery after storms, from 2000 to 2006. The same is true for 2007, with MECO (75.0% - down 1.9 points) maintaining its slight lead over Hawaiian Telcom/Verizon Hawaii (73.3% - down 1.8 points).

Figure 6
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Fast Recovery After Storms



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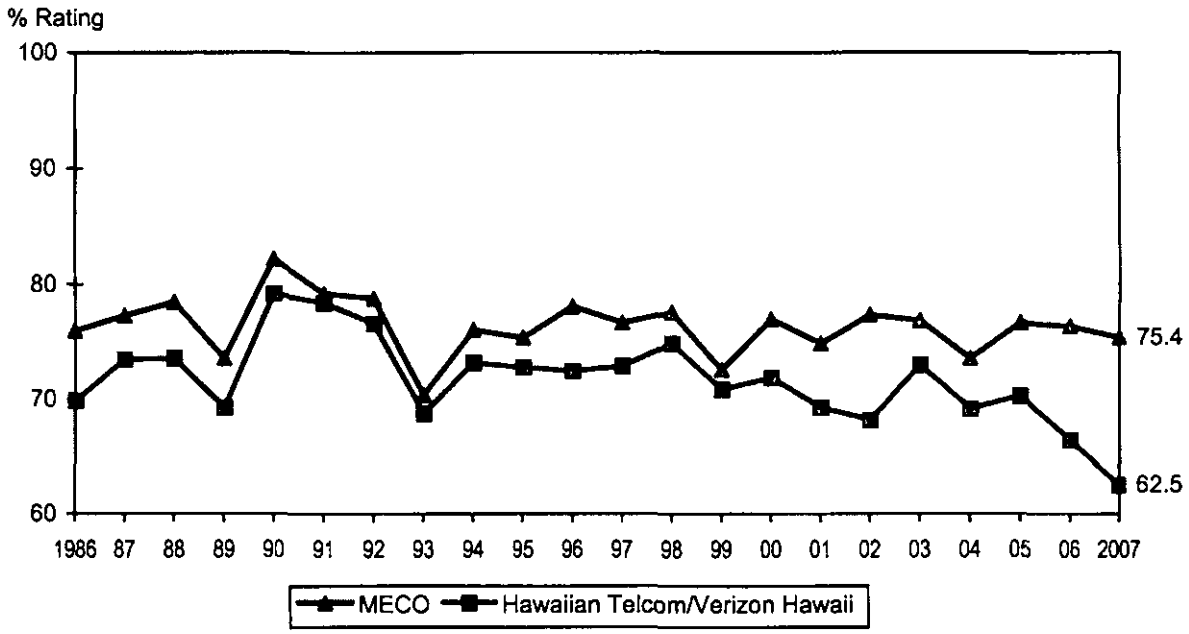
As shown in Figure 7 below, overall ratings for fast response to trouble calls for MECO fell 1.0 point to 75.4% in 2007. Ratings for Hawaiian Telcom/Verizon Hawaii fell more dramatically --- 3.9 points to 62.5%.

Figure 7
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Fast Response to Trouble Calls



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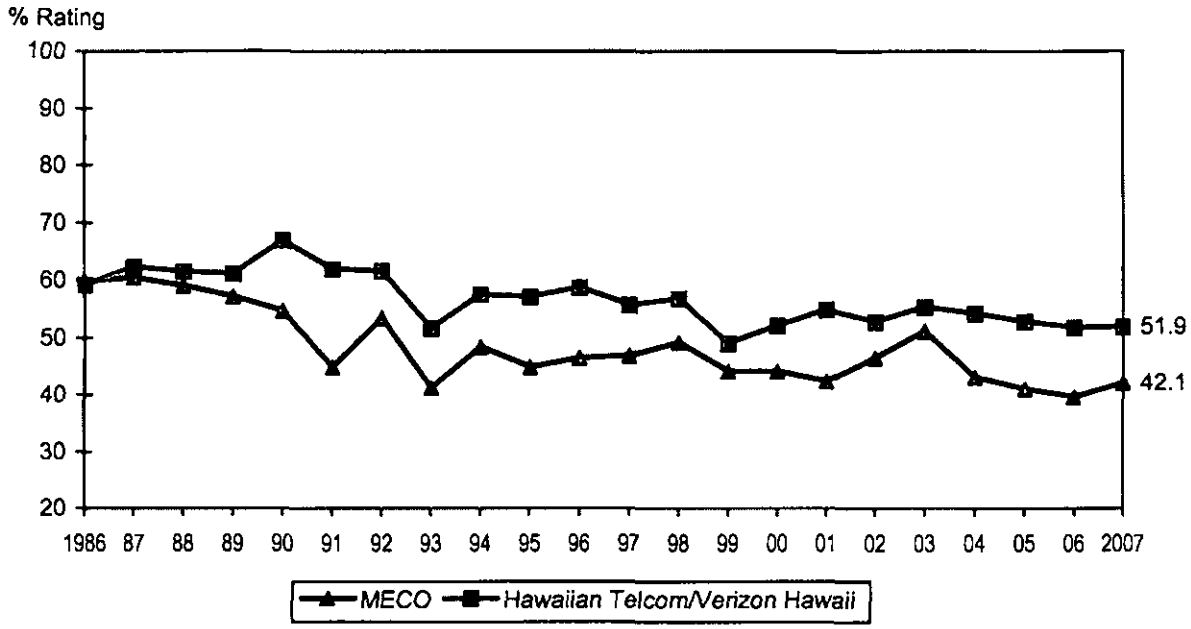
MECO's rating on low cost has trailed that of Hawaiian Telcom/Verizon Hawaii since 1987, as shown in Figure 8 below. Hawaiian Telcom/Verizon Hawaii's current lead over MECO stands at 9.8 points. The gap is 2.4 points less than in 2006, due largely to the 2.5 point increase in MECO's ratings (42.1% - up from 39.6%).

Figure 8
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Low Cost



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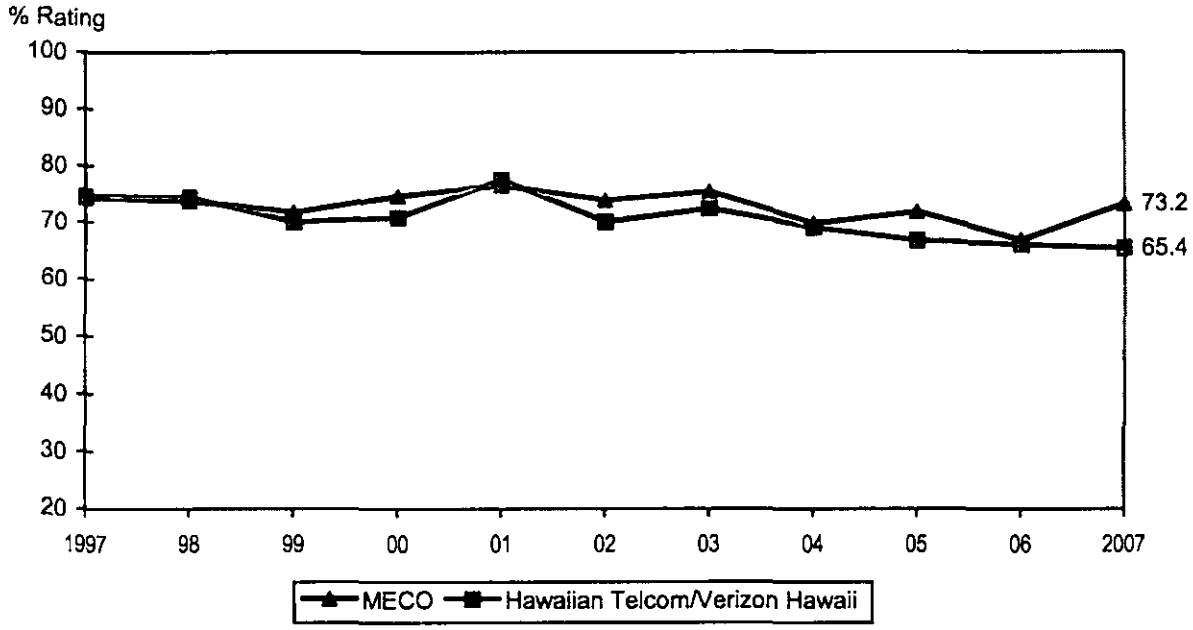
VALUE FOR THE MONEY OF UTILITY SERVICES

In 1994, MECO began asking customers to rate the "value for the money" of utility services. Perceived "value for the money" of electric service rose 6.4 points in 2007 (73.2% - up from 66.8%). In contrast, perceived "value for the money" of telephone service decreased 0.8 points (65.4% - down from 66.2%).

Figure 9
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Value for the Money



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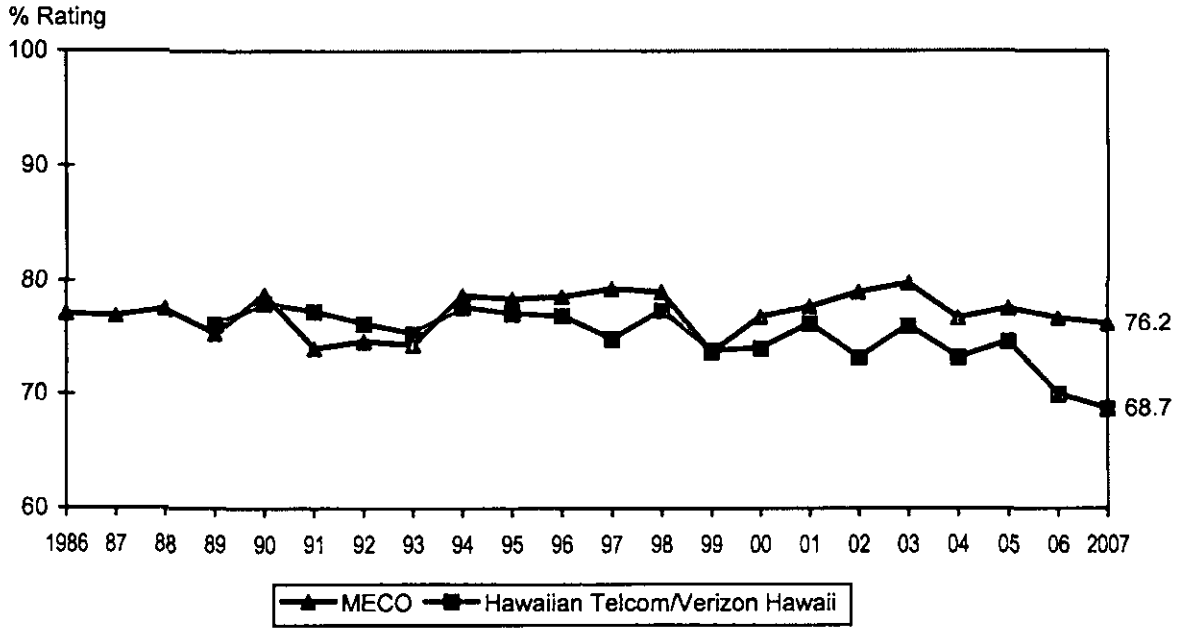
OVERALL PERFORMANCE: OVERALL RATING OF MECO

Aided by a 1.3 point drop in ratings for Hawaiian Telcom/Verizon Hawaii, MECO's advantage over the communications company in terms of overall performance continues to increase. The current gap between the two utilities --- the largest recorded in tracking --- is 7.5 points.

Figure 10
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Overall Performance



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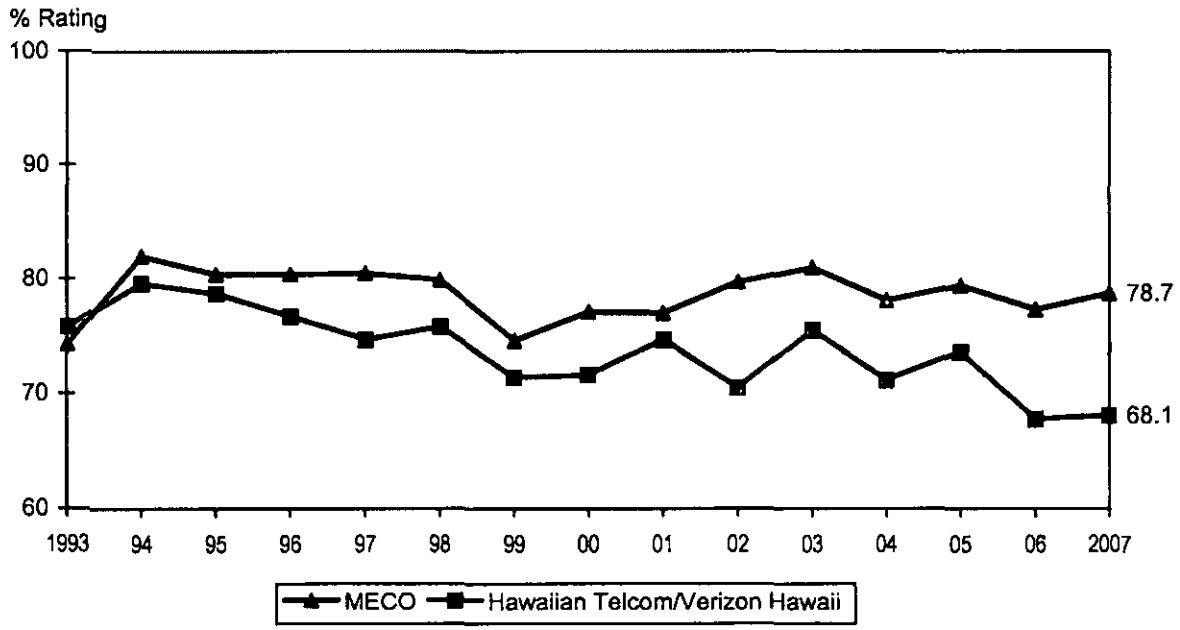
CUSTOMER SATISFACTION

In 1993, MECO began asking customers to rate their overall satisfaction with services provided to them by MECO and Hawaiian Telcom/Verizon Hawaii. Overall satisfaction ratings for both utilities increased in 2007: ratings for MECO increased 1.4 points (78.7%, from 77.3%), while the increase in ratings for Hawaiian Telcom/Verizon Hawaii was less noticeable at 0.3 points (68.1%, from 67.8%).

MECO has outperformed Hawaiian Telcom/Verizon Hawaii on this measure since 1994 and, in 2007, continues to generate higher levels of customer satisfaction than does the communications company. In addition, MECO's 10.6 point lead over Hawaiian Telcom/Verizon Hawaii is the largest in tracking.

Figure 11
Comparison of MECO and Hawaiian Telcom/Verizon Hawaii
Customer Satisfaction



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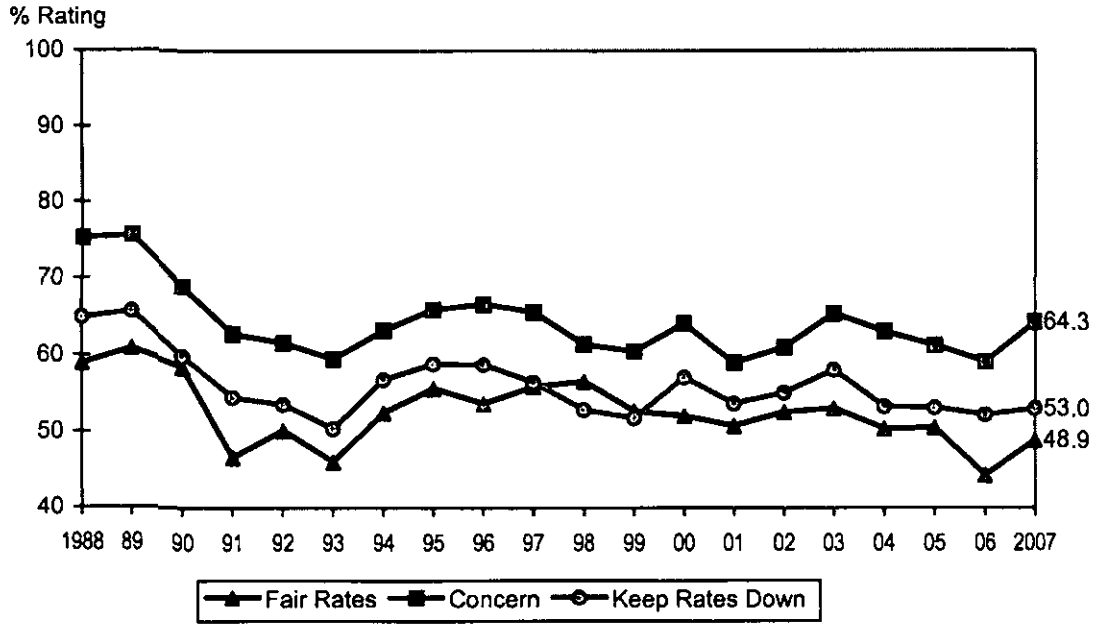
RATINGS OF MECO CONCERN AND FAIRNESS

In 2007, customers were again asked to rate MECO on three attributes: 1) maintaining fairness of rates; 2) expressing concern for customers; and 3) working with customers to keep electric bills down. As shown below in Figure 12, MECO's ratings, following decreases in 2004 to 2006, increased across the board. Ratings for expressing concern for customers increased 5.1 points to 64.3%; working with customers to keep rates down increased 0.8 points to 53.0%; and fairness of rates increased 4.6 points to 48.9%.

Figure 12
Ratings of MECO Concern and Fairness



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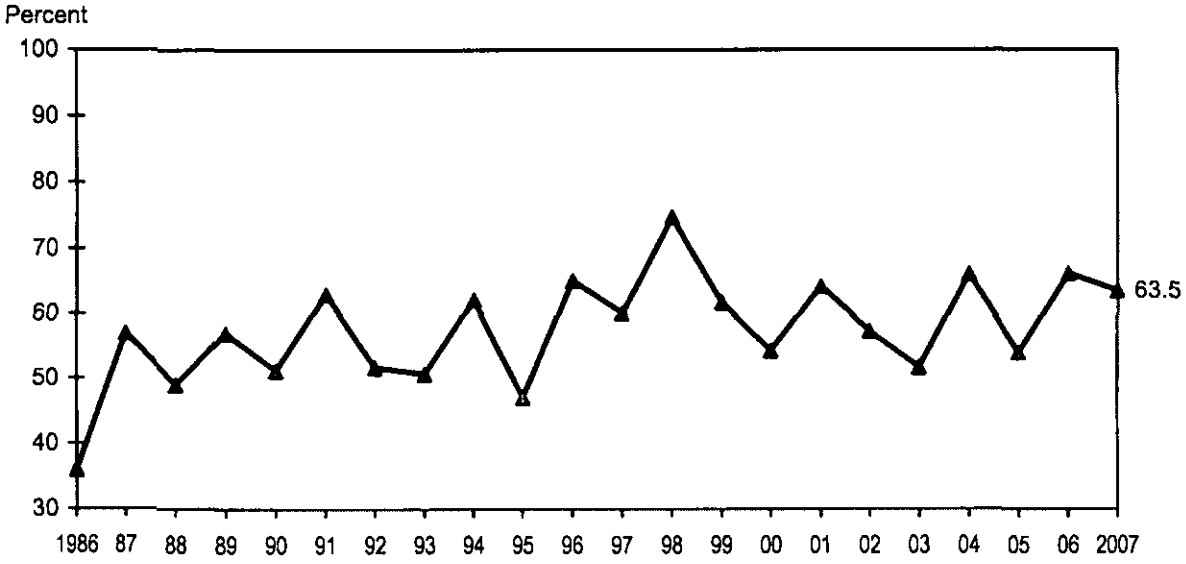
SERVICE INTERRUPTIONS IN THE NEIGHBORHOOD

In 2007, 63.5% of all respondents reported that a power outage occurred in their neighborhood, 2.7 points fewer than in 2006. Among them, 36.9% (up 2.1 points) said the power remained off for an extended period of time rather than for just a few minutes.

Figure 13
Service Interruptions in Neighborhood



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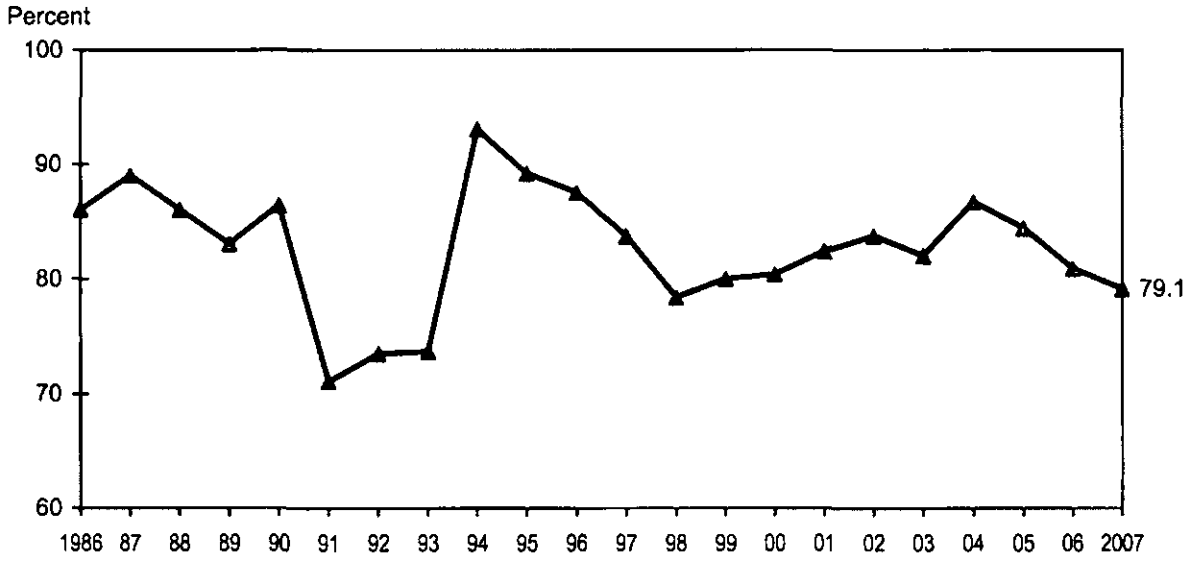
Among those affected by an outage, eight in ten (79.1% - down 1.8 points) indicated that they were satisfied with how MECO handled the problem (Figure 14).

Figure 14
Satisfaction with MECO's Handling of Service Interruptions



As in the past, only one-fourth of the respondents affected by an outage actually contacted MECO to report the problem (24.0% - up 1.6 points). Approximately seven in ten of those who did report an outage were satisfied with how the call was handled (72.5% - down 3.6 points). Consistent with years prior, those who were dissatisfied mainly expressed frustration with being unable to get through and get answers. However, this dissatisfaction comes from a small number of respondents (18 out of 452 or 4.0% of all respondents), making the reasons difficult to generalize to all Maui residential customers.

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CONSUMER LINES

The informational bill insert, Consumer Lines, is included in monthly statements sent to MECO customers. It offers conservation and safety tips, as well as recipes, stories, and ideas to help keep customers informed about MECO and the use of electricity.

In 2007, two-thirds of all respondents (67.4% - down 2.9 points) indicated seeing the Consumer Lines pamphlet, with a similar proportion (63.5% - up 2.8 points) saying that they read at least some or all of the articles or items. Those who replied that they regularly read at least part of Consumer Lines were most likely to read and recall articles on ways to conserve energy (40.5% - up 6.0 points), recipes (32.9% - down 2.2 points), and the solar power program (16.8% - down 5.4 points).

Table 7
Consumer Lines

Have you seen the newsletter, Consumer Lines enclosed with your monthly electric bill?	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Yes	61.9%	67.7%	76.3%	69.0%	70.0%	58.5%	68.1%	71.0%	70.3%	67.4%
No	36.1%	30.3%	22.0%	29.3%	28.0%	40.5%	31.8%	27.3%	27.3%	30.6%
Don't know	1.9%	2.0%	1.7%	1.7%	2.0%	1.0%	2.3%	1.7%	2.3%	2.0%
How much of the Consumer Lines do you read?										
All of them	25.5%	15.3%	22.3%	17.9%	16.7%	9.7%	10.9%	21.1%	20.9%	23.6%
Some of them	39.6%	36.5%	45.0%	51.7%	41.9%	44.3%	55.7%	44.1%	39.8%	39.9%
A little	14.1%	31.5%	17.0%	15.0%	23.8%	23.9%	19.4%	17.8%	20.4%	21.7%
Not at all	20.8%	16.3%	15.3%	15.0%	16.2%	22.2%	13.4%	16.4%	18.0%	14.3%
Don't know	0.0%	0.5%	0.4%	0.5%	1.4%	0.0%	0.5%	0.5%	0.9%	0.5%

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PROTECTING THE ENVIRONMENT

Consistent with previous years, more than one-half of all respondents said that MECO is doing its best to protect the environment (54.9% - up 0.7 points).

Table 8
Environmental Protection

MECO is doing its best to protect the environment	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Agree	56.1%	52.0%	55.6%	49.6%	54.0%	53.2%	52.0%	55.3%	54.2%	54.9%
Disagree	29.7%	28.9%	28.0%	35.3%	27.1%	22.0%	28.6%	28.9%	28.8%	27.9%
Don't know	14.2%	19.1%	16.4%	15.1%	18.9%	24.8%	19.4%	15.8%	17.0%	17.3%

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PAY MORE FOR ENVIRONMENTALLY FRIENDLY ENERGY SOURCES

In 1998, MECO began asking customers if they would be willing to pay more if the electric company would do more to develop and use alternate energy sources that are more environmentally friendly. As shown below in Table 9, the willingness of respondents to pay more for environmentally friendly energy sources was consistent from 2004 to 2005 then fell 4.6 points in 2006. In 2007, 47.8% of respondents said that they would be willing to pay more --- a 5.1 point increase. Among them, approximately one-half (48.6% - down 3.0 points) said that they are willing to pay at least $10 or more.

Table 9
Pay More for Environmentally Friendly Alternate Energy Sources

Would you be willing to pay more for environmentally friendly energy sources?	2003		2004		2005		2006		2007	
	number	%	number	%	number	%	number	%	number	%
I would be willing to pay more	100	33.2%	144	47.4%	142	47.3%	128	42.7%	144	47.8%
I am not willing to pay more	161	53.5%	138	45.4%	144	48.0%	155	51.7%	131	43.5%
Don't know/No opinion/Other	40	13.3%	22	7.2%	14	4.7%	17	5.7%	26	8.6%
How much would you be willing to pay?										
$1.00 or less	4	4.0%	2	1.4%	1	0.7%	2	1.6%	8	5.6%
$2.00	20	20.0%	7	4.9%	9	6.3%	4	3.1%	8	5.6%
$3.00	3	3.0%	4	2.8%	6	4.2%	1	0.8%	3	2.1%
$4.00	0	0.0%	1	0.7%	2	1.4%	1	0.8%	2	1.4%
$5.00	28	28.0%	28	19.4%	29	20.4%	24	18.8%	24	16.7%
$6.00	0	0.0%	2	1.4%	1	0.7%	0	0.0%	0	0.0%
$7.00	1	1.0%	0	0.0%	1	0.7%	3	2.3%	3	2.1%
$8.00	0	0.0%	1	0.7%	1	0.7%	0	0.0%	2	1.4%
$9.00	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Greater than or equal to $10.00	31	31.0%	68	47.2%	63	44.4%	66	51.6%	70	48.6%
Don't Know	13	13.0%	31	21.5%	29	20.4%	27	21.1%	24	16.7%

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WILLINGNESS OF CUSTOMERS TO PAY FOR MOLOKAI AND LANAI

Customers on Molokai and Lanai currently pay a higher rate for electricity than do those on Maui. Beginning in 1995, respondents were asked questions about whether they would be willing to pay more for their electricity so that customers on Maui, Molokai, and Lanai would pay the same rate.

Although the proportion of respondents who answered "yes" increased (20.3% - up 5.0 points), a majority of Maui customers are still not willing to pay more to share the burden of higher costs of electricity with Molokai and Lanai customers (62.8% - down 9.9 points). Among those who favored or were not sure if they would want to pay more (36.6% - up 9.6 points), nearly three out of four were willing to pay at least a 2% increase or about $3.90 more a month on a typical monthly bill (72.7% - up 7.3 points).

Table 10
Maui Customers Paying More to Subsidize Molokai and Lanai

Would you be willing to pay more for your electricity so that people on all three islands would be paying the same rate?	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Yes	20.3%	15.7%	16.0%	12.7%	14.7%	13.6%	22.7%	17.7%	15.3%	20.3%
No	68.4%	70.7%	69.0%	77.0%	58.7%	73.1%	67.4%	73.3%	72.7%	62.8%
Not sure, depends	10.7%	12.6%	14.3%	10.3%	26.4%	12.6%	9.9%	8.3%	11.7%	16.3%
Refused	60.0%	1.0%	0.7%	0.0%	0.3%	0.7%	0.0%	0.7%	0.3%	0.7%
Pay more if increase was 2 percent or $3.90 more a month?										
Yes	79.2%	77.6%	75.8%	72.5%	54.5%	74.7%	84.8%	80.8%	65.4%	72.7%
No	13.5%	12.9%	16.5%	8.7%	8.9%	7.6%	6.1%	10.3%	9.9%	18.2%
Not sure, depends	6.3%	8.2%	7.7%	18.8%	35.8%	17.7%	9.1%	9.0%	24.7%	9.1%
Refused	1.0%	1.2%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Pay more if increase was 5 percent or $9.75 more a month?										
Yes	47.6%	28.8%	40.8%	28.6%	25.2%	37.0%	37.6%	44.3%	38.4%	34.4%
No	10.2%	56.2%	46.1%	46.0%	51.4%	35.6%	50.5%	40.0%	35.6%	53.3%
Not sure, depends	12.2%	13.7%	13.2%	23.8%	23.4%	27.4%	11.8%	15.7%	26.0%	11.1%
Refused	0.0%	1.4%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%
Pay more if increase was 7 percent or $13.65 more a month?										
Yes	49.0%	45.2%	36.6%	12.1%	16.7%	17.0%	n/a	n/a	n/a	36.6%
No	34.7%	25.8%	39.0%	51.5%	46.3%	36.2%	n/a	n/a	n/a	43.9%
Not sure, depends	16.3%	29.0%	24.4%	33.3%	35.2%	46.8%	n/a	n/a	n/a	19.5%
Refused	0.0%	0.0%	0.0%	3.0%	1.9%	0.0%	n/a	n/a	n/a	0.0%
Pay more if increase was 10 percent or $19.50 more a month?										
Yes	50.0%	26.1%	32.0%	20.0%	21.4%	20.0%	n/a	n/a	n/a	39.1%
No	28.1%	43.5%	28.0%	33.3%	32.1%	10.0%	n/a	n/a	n/a	30.4%
Not sure, depends	21.9%	30.4%	40.0%	46.7%	46.4%	70.0%	n/a	n/a	n/a	30.4%
Refused	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	n/a	n/a	n/a	0.0%

[Note: See Appendix A: Survey History for specific conversions by year.]

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WOULD CONSIDER ANOTHER ELECTRIC COMPANY

One way of assessing customer loyalty is to ask residents how likely they would be to consider another electric energy supplier if one were available. The question was asked for the first time in the 1999 survey.

As shown below in Table 11, the proportion of respondents saying they would definitely or probably switch to an alternative energy supplier if one were available decreased 5.3 points from 2006 to 2007. Three in ten respondents said that they would definitely or probably switch from MECO (29.9%). In comparison, 41.6% said that they would definitely or probably remain loyal to MECO (up 0.9 points) and 28.5% said they didn't know (up 4.4 points).

Table 11
Would Choose Another Electric Company

If you had a choice, would you choose another electric company?	1999	2000	2001	2002	2003	2004	2005	2006	2007
I would definitely/probably not switch	35.6%	33.9%	43.1%	47.6%	46.4%	43.4%	42.5%	40.7%	41.6%
I would definitely/probably switch	40.4%	43.4%	28.2%	30.0%	28.2%	30.8%	32.6%	35.2%	29.9%
I don't know	24.0%	22.7%	28.7%	22.4%	25.4%	25.8%	24.9%	24.1%	28.5%

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APPENDICES

APPENDIX A: SURVEY HISTORY

In 1984, a benchmark survey of residential customers of the Hawaiian Electric Company (HECO) was conducted. It also served as a starting point from which to track the impact of corporate communication programs, advertising campaigns, and customer service improvements during subsequent years.

In 1985, the survey was modified to also document attitude changes among customers, and benchmark surveys were conducted with residential customers of Maui Electric Company (MECO) and Hawaii Electric Light Company (HELCO).

Throughout the years, the purpose and objectives of the tracking program have been re-examined and revised. In 1992, the survey was changed significantly to reflect the very large television advertising campaign that took place that year. The objectives of the resulting consumer survey were to:

1. Measure consumer name and advertising awareness for companies providing basic services in Hawaii;

2. Measure consumer attitudes toward their electric company and providers of other utility services;

3. Measure consumer willingness to pay for specific electric company actions; and

4. Measure consumer opinions of the electric company's honesty and integrity.

In 1993, several response categories were added, and some others were revised or omitted. Additional questions were added to determine the level of recall and use of the Storm Tracks newspaper insert (dropped in 1994), satisfaction with how calls to MECO are handled during power outages, awareness of automatic bill payment (dropped in 2001), and MECO's contribution to the community. In addition, Corporate Image and Customer Satisfaction questions were asked quarterly, and the results aggregated to represent a time-weighted average value for the full year, rather than a single week during the year.

In 1994, additional revisions were made to the survey instrument, including questions about what customers feel are the biggest threats to Hawaii's environment, and their willingness to purchase an electric powered vehicle (dropped in 1995). Furthermore, whereas Random Digit Dialing had been used to develop the sample frame in previous years, a random extract of residential customers from MECO's billing system was used beginning in 1994.

From 1986 through 1989, most of the survey's rating items were asked using a four-point scale. Weights were assigned to each point of the scale, and the percent of the total possible points achieved was reported as an index rating for each item. Beginning in 1990, although the wording of the items was not changed substantially, a five-point rather than a four-point scale was used. Again, each point on the scale was assigned a weight, and an index rating or percentage of maximum score was calculated.

In 1993, the weights assigned to the five-point scale were revised to assume equal appearing intervals. A summary of these scaling changes and the weights associated with various points on the scales is shown in the following table.

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YEARS	SCALE TYPE	WEIGHTING
1986 - 1989	4 point scale	1 = 0 2 = 20 3 = 60 4 = 100
1990 - 1992	5 point scale	1 = 0 2 = 20 3 = 40 4 = 60 5 = 100
1993 – present	5 point scale	1 = 0 2 = 25 3 = 50 4 = 75 5 = 100

As a result of confusion and uncertainty surrounding these changes in scaling and weighting, some figures for years prior to 1990 were incorrectly estimated in the 1994 Residential Customer Survey Report. *A further discussion of the calculation of percent ratings can be found in Appendix B:* Method in this report.

In the 1995 report, attempts were made to adjust for historical scaling and weighting differences. Index ratings for all questions which seek similar information have been estimated for the historical period. While the four category numerical scale used in 1986-1989 and the slightly different scale used in 1990-1992 cannot necessarily be converted reliably into the five-point ratings used in the current survey's scales, it is hoped that this procedure will allow the data to indicate at least some of *the trends that may have occurred over the ten year tracking period for these measures.*

In 1995, questions were added to determine if customers would be willing to pay more for their electricity so that customers on Maui, Molokai, and Lanai would pay the same rate for electricity. In 2001, the monetary amount of each question was increased: two percent increased from $1.50 to $2.20; five percent, from $4.00 to $5.50; seven percent, from $5.50 to $7.50; and ten percent, from $8.00 to $11.00. In 2003, the monetary amount of each question was raised once more: two percent increased from $2.20 to $2.30; five percent, from $5.50 to $5.80; seven percent, from $7.50 to $8.10; and ten percent, from $11.00 to $11.60. In 2004, the monetary amount of each question was raised such that two percent increased from $2.30 to $2.60 and five percent from $5.80 to $6.40 (with seven and ten percent questions being dropped from the survey). In 2005, the monetary amount for each question was again increased: two percent increased from $2.60 to $3.00 and five percent from $6.40 to $7.50 a month. In 2006, the monetary amount for each question was increased yet again: two percent increased from $3.00 to $3.50 and five percent from $7.50 to $8.65 a month. In 2007, the monetary amount for each question increased once more: two percent increased from $3.50 to $3.90 and five percent from $8.65 to $9.75. Respondents were also asked if they would pay 7% or $13.65 more and 10% or $19.50 more --- these questions were not asked in 2004, 2005, or 2006.

In 1996, additional questions were added to determine the level of recall of recent cost savings and informational programs offered by MECO, and recall of recent stories in the news concerning Maui Electric.

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In 1997, questions of name and advertising awareness regarding "The Gas Company" were added to measure response differences for companies providing basic services in Hawaii.

In 1998, questions were added to identify if MECO customers were willing to pay more on their electric bill each month if the electric company would do more to develop and use alternate energy sources that are more environmentally friendly.

In 1999, Mattson Sunderland Research and Planning Associates, Inc. assumed responsibility for conducting the Residential Customer Survey for Maui Electric Company. Two surveys have been conducted annually: one in the second quarter and a year-end survey in the third quarter.

In 1999, a question about whether the customer would select another electric company if offered a choice was added to the third quarter survey.

For 2001, questions about power outages asked in the year-end survey were added to the second quarter survey. A series of questions related to recent energy events in California and a rating of the respondent's survey experience overall and a reason for this rating were added to the year-end survey.

In 2002, the survey added a question about whether the respondent knew or was acquainted with anyone who worked at the electric company.

In 2004, Ward Research, Inc. assumed responsibility for conducting the year-end Residential Customer Survey for Maui Electric Company, conducted in the third quarter. The firm worked with second quarter data collected by another contractor, creating the weighted results for 2004.

In 2005, a mention of either Verizon Hawaii or Hawaiian Telcom was counted as one mention of Hawaiian Telcom/Verizon Hawaii, to reflect the company's name change.

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APPENDIX B: METHOD

This section describes the methods employed to conduct the survey of Maui Electric Company customers.

Survey Instrument

A survey instrument was designed in consultation with the Maui Electric Company. The survey is part of an annual tracking study, but was revised significantly before the 1994 and 1995 surveys. After revisions were made, a pretest was conducted to ensure that the instrument could be administered in a smooth and clearly understandable manner. Copies of the 2007 quarterly and year-end survey instruments are included in Appendices D & E.

Sample

The sample frame was defined as all adult residents (persons 18 years of age or older) of Maui with working telephone service who have active schedule "R" accounts with MECO. An equal probability sample for this survey was drawn from a master list of residential customers drawn from the ACCESS billing system.

The total sample size for the Maui survey was targeted at 151 respondents for the second quarter survey, and 301 for the third quarter year-end survey. This provides an estimated margin of error of approximately six percentage points for the year end, approximately eight percentage points for each quarterly survey, and about five percentage points for quarterly and year end data combined.

Beginning with the 2004 survey the sample of residential customer telephone numbers is checked against a database of all Maui County residential listed telephone numbers by two national firms, Acxiom and Marc Publishing and Information Services, to ensure that each number is listed in the white pages telephone directory prior to fielding.

Fielding

Interviewer training presented the overall goals and objectives of the study and review of the survey instrument to ensure that interviewers understand the information being sought from respondents, the categories of response, and skip patterns.

All telephone interviewing was conducted using CATI (Computer Assisted Telephone Interviewing). CATI is the fastest, most accurate, and most versatile way to do telephone surveys, allowing telephone surveys with complex contingency response patterns and increasing the accuracy of survey responses through entering data directly without keypunching, ensuring that 100 percent of all responses are consistent with proper skip patterns and contain no out-of-range codes. CATI allowed the random rotation of items in order to prevent any bias in responses that could be caused by particular questions or items being mentioned earlier, or later, than others.

The CATI supervisors and the interviewing staff for this project were experienced in the administration of public opinion surveys in Hawaii and in the use of CATI systems. All CATI interviewing was electronically monitored.

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To ensure an adequate completion rate with the initial sample and to provide increased assurance that results are representative of the population, at least five attempts were made to contact an eligible sample household. Callbacks were automatically scheduled for each interviewer by the CATI system, and were made at a different time of day than previous attempts.

Interviewing hours were from 4:30 p.m. to 8:30 p.m. on weekdays and 9:00 a.m. to 5:00 p.m. on Saturday and Sunday.

Quarter	Survey Began	Survey Ended	No. Completed
2	May 17, 2007	May 23, 2007	151
3	July 30, 2007	August 12, 2007	301

Data Processing

After fielding and editing, the data were processed using the SPSS statistical package.

Percent Rating Calculations

Located within this report are percent (%) rating figures derived from questionnaire responses. These ratings are based on responses to various Likert type scales. Prior to 1990, a four-point scale was used. A five-point scale was used starting in 1990 in order to allow for better multivariate analyses, while still maintaining comparability with the previous results. In order to be compared to previous results, the % rating was created by assigning percentage points to each of the five possible answers. The points assigned were 5 = 100%, 4 = 75%, 3 = 50%, 2 = 25% and 1 = 0%. For the survey years 1990-1992, the points assigned were 5 = 100%, 4 = 60%, 3 = 40%, 2 = 20%, and 1 = 0%. For four point scales, assigned points were 4 = 100%, 3 = 60%, 2 = 20%, and 1 = 0%. For seven point scales, assigned points were 7 = 100%, 6 = 83.3%, 5 = 66.7%, 4 = 50%, 3 = 33.3%, 2 = 16.7%, and 1 = 0%.

The total number of points was summed and divided by the total number of possible points (100 times the number of respondents giving an opinion). The result is a rating that represents the percentage of the maximum score possible. By using the % of maximum score ratings, survey results from a variety of scales can be directly compared. The % of maximum score is also a concept readily understood by virtually everyone as a result of their school grading experience.

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APPENDIX C: DATA TABULATIONS

Table C-1: Name Awareness of Basic Service Providers in Hawai'i

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
When you think of large companies that provide basic services to Hawai'i's residents, which ones come to mind?																				
Maui Electric																				
Top-of-mind	146	47.1%	150	50.0%	143	47.7%	182	60.7%	198	66.0%	163	54.2%	170	55.9%	152	50.7%	154	51.3%	141	46.8%
Other unaided	65	21.0%	62	20.7%	48	16.0%	57	19.0%	45	15.0%	45	15.0%	50	16.4%	53	17.7%	59	19.7%	44	14.6%
Aided awareness	98	31.6%	88	29.3%	108	36.0%	61	20.3%	55	18.3%	92	30.6%	84	27.6%	94	31.3%	87	29.0%	112	37.2%
Not heard of	1	0.3%	0	0.0%	1	0.3%	0	0.0%	2	0.7%	1	0.3%	0	0.0%	1	0.3%	0	0.0%	4	1.3%
Verizon Hawaii/Hawaiian Telcom																				
Top-of-mind	84	27.1%	75	25.0%	62	20.7%	64	21.3%	44	14.7%	56	18.6%	49	16.1%	41	13.7%	49	16.3%	29	9.6%
Other unaided	88	28.4%	85	28.3%	79	26.3%	103	34.3%	114	38.0%	58	19.3%	85	28.0%	104	34.7%	101	33.7%	81	26.9%
Aided awareness	137	44.2%	135	45.0%	155	51.7%	128	42.7%	141	47.0%	184	61.1%	168	55.3%	152	50.7%	145	48.3%	172	57.1%
Not heard of	1	0.3%	5	1.7%	4	1.3%	5	1.7%	1	0.3%	3	1.0%	2	0.7%	3	1.0%	5	1.7%	19	6.3%
Gas Company (net)																				
Top-of-mind	4	1.3%	3	1.0%	3	1.0%	0	0.0%	3	1.0%	6	2.0%	2	0.7%	2	0.7%	4	1.3%	6	2.0%
Other unaided	12	3.9%	11	3.7%	18	6.0%	9	3.0%	18	6.0%	9	3.0%	13	4.3%	16	5.3%	17	5.7%	13	4.3%
Aided awareness	235	75.8%	227	75.7%	220	73.3%	188	62.7%	184	61.3%	196	65.1%	227	74.7%	224	74.7%	216	72.0%	230	76.4%
Not heard of	59	19.0%	59	19.7%	59	19.7%	103	34.3%	95	31.7%	90	29.9%	62	20.4%	58	19.3%	63	21.0%	52	17.3%
Other																				
Top-of-mind	26	8.4%	38	12.7%	51	17.0%	29	9.7%	25	8.3%	6	2.0%	54	17.8%	61	20.3%	44	14.7%	68	22.6%
Other unaided	45	14.5%	73	24.3%	47	15.7%	36	12.0%	81	27.0%	36	12.0%	90	29.6%	97	32.3%	90	30.0%	81	26.9%
No aided recall	239	77.1%	189	63.0%	202	67.3%	235	78.3%	194	64.7%	259	86.0%	160	52.6%	142	47.3%	166	55.3%	152	50.5%

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Table C-2: Advertising Awareness of Basic Service Providers in Hawai'i

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
For which companies that provide basic services do you remember seeing or hearing advertising in the past month?																				
Maui Electric																				
Top-of-mind	24	7.7%	42	14.0%	31	10.3%	35	11.7%	43	14.3%	34	11.3%	42	13.8%	34	11.3%	40	13.3%	38	12.6%
Other unaided	19	6.1%	14	4.7%	22	7.3%	21	7.0%	25	8.3%	14	4.7%	21	6.9%	17	5.7%	17	5.7%	20	6.6%
Aided recall	89	28.7%	76	25.3%	67	22.3%	50	16.7%	71	23.7%	83	27.6%	46	15.1%	64	21.3%	63	21.0%	70	23.3%
No ad awareness	178	57.4%	168	56.0%	180	60.0%	194	64.7%	161	53.7%	170	56.5%	195	64.1%	185	61.7%	180	60.0%	173	57.5%
Verizon Hawaii/Hawaiian Telcom																				
Top-of-mind	86	27.7%	73	24.3%	124	41.3%	131	43.7%	90	30.0%	81	26.9%	72	23.7%	70	23.3%	61	20.3%	42	14.0%
Other unaided	8	2.6%	13	4.3%	13	4.3%	5	1.7%	16	5.3%	9	3.0%	16	5.3%	15	5.0%	21	7.0%	15	5.0%
Aided recall	128	41.3%	123	41.0%	96	32.0%	126	42.0%	146	48.7%	164	54.5%	158	52.0%	141	47.0%	131	43.7%	132	43.9%
No ad awareness	88	28.4%	91	30.3%	67	22.3%	38	12.7%	48	16.0%	47	15.6%	58	19.1%	74	24.7%	87	29.0%	112	37.2%
Gas Company (net)																				
Top-of-mind	5	1.6%	1	0.3%	3	1.0%	0	0.0%	0	0.0%	3	1.0%	2	0.7%	0	0.0%	1	0.3%	5	1.7%
Other unaided	6	1.9%	3	1.0%	2	0.7%	0	0.0%	6	2.0%	2	0.7%	1	0.3%	3	1.0%	3	1.0%	1	0.3%
Aided recall	72	23.2%	33	11.0%	36	12.0%	28	9.3%	30	10.0%	30	10.0%	54	17.8%	48	16.0%	48	16.0%	55	18.3%
No ad awareness	227	73.2%	263	87.7%	259	86.3%	272	90.7%	264	88.0%	266	88.4%	247	81.3%	249	83.0%	248	82.7%	240	79.7%
Other																				
Top-of-mind	38	12.2%	43	14.3%	56	18.7%	17	5.7%	30	10.0%	14	4.7%	60	19.7%	52	17.3%	47	15.7%	76	25.2%
Other unaided	14	4.5%	16	5.3%	22	7.3%	9	3.0%	13	4.3%	10	3.3%	0	0.0%	0	0.0%	0	0.0%	18	6.0%
No aided recall	258	83.2%	241	80.3%	222	74.0%	274	91.3%	257	85.7%	277	92.0%	244	80.3%	248	82.7%	253	84.3%	207	68.8%

Table C-3: Advertising Recall for Maui Electric Company

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
You said you remember advertising for the electric company. What do you remember seeing or hearing?																				
conservation of energy	21	13.5%	24	18.2%	24	20.0%	30	28.3%	38	27.3%	57	43.5%	25	22.9%	33	29.2%	28	23.3%	38	29.7%
other resources, solar, wind, etc	8	5.1%	21	15.9%	29	24.2%	26	24.5%	29	20.9%	20	15.3%	25	22.9%	14	12.4%	32	26.7%	15	11.7%
rates	9	5.8%	4	3.0%	4	3.3%	6	5.7%	8	5.8%	3	2.3%	2	1.8%	2	1.8%	4	3.3%	5	3.9%
CFL's - television/radio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	3.9%
students/solar system/new ad	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	6.7%	4	3.1%
employees, on the job	3	1.9%	4	3.0%	2	1.7%	5	4.7%	1	0.7%	7	5.3%	1	0.9%	1	0.9%	4	3.3%	3	2.3%
a flyer/bill insert/in the mail	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	6.4%	n/a	n/a	0	0.0%	2	1.6%
CFL's - coupons, print	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	2.3%
anything about Jade Moon	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	2.3%
environment, testing the water	1	0.6%	2	1.5%	4	3.3%	1	0.9%	1	0.7%	1	0.8%	n/a	n/a	1	0.9%	1	0.8%	1	0.8%
Rolling blackouts/conservation	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0.8%
HEI or an HEI company	1	0.6%	0	0.0%	5	4.2%	8	7.5%	4	2.9%	6	4.6%	3	2.8%	3	2.7%	0	0.0%	0	0.0%
American Savings	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1	0.9%	0	0.0%	0	0.0%
service calls	6	3.8%	5	3.8%	4	3.3%	6	5.7%	7	5.0%	1	0.8%	1	0.9%	n/a	n/a	4	3.3%	0	0.0%
storm tracks	2	1.3%	0	0.0%	2	1.7%	1	0.9%	7	5.0%	0	0.0%	1	0.9%	n/a	n/a	0	0.0%	0	0.0%
dealing with power outages	n/a	n/a	3	2.3%	6	5.0%	3	2.8%	5	3.6%	3	2.3%	n/a	n/a	n/a	n/a	1	0.8%	0	0.0%
nothing	8	5.1%	4	3.0%	5	4.2%	2	1.9%	4	2.9%	4	3.1%	2	1.8%	5	4.4%	3	2.5%	6	4.7%
other	42	26.9%	44	33.3%	22	18.3%	7	6.6%	15	10.8%	3	2.3%	13	11.9%	27	23.9%	13	10.8%	25	19.5%
don't remember	55	35.3%	50	37.9%	24	20.0%	27	25.5%	36	25.9%	37	28.2%	32	29.4%	36	31.9%	37	30.8%	40	31.3%
Total number of respondents	156		132		120		106		139		131		109		113		120		128	

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Table C-4: Advertising Recall for Verizon Hawaii/Hawaiian Telcom

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
You said you remember advertising for Verizon Hawaii/Hawaiian Telcom. What do you remember seeing or hearing?																				
Just remember, it was on TV	70	31.7%	64	30.6%	39	16.7%	116	44.3%	57	22.6%	67	26.4%	44	17.9%	36	16.1%	45	21.1%	40	21.2%
services offered	29	13.1%	27	12.9%	39	16.7%	54	20.6%	73	29.0%	81	31.9%	50	20.3%	33	14.8%	33	15.5%	39	20.6%
internet services	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24	9.8%	n/a	n/a	25	11.7%	28	14.8%
their phones work during power outage	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12	6.3%
package of services/bundling	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11	5.8%
lower rates	14	6.3%	27	12.9%	10	4.3%	39	14.9%	29	11.5%	25	9.8%	17	6.9%	10	4.5%	8	3.8%	7	3.7%
long distance calls	18	8.1%	27	12.9%	8	3.4%	56	21.4%	43	17.1%	35	13.8%	13	5.3%	2	0.9%	4	1.9%	6	3.2%
newspaper ads	14	6.3%	17	8.1%	9	3.9%	36	13.7%	19	7.5%	6	2.4%	15	6.1%	9	4.0%	11	5.2%	4	2.1%
wireless/satellite/cell phones	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	29	11.8%	n/a	n/a	15	7.0%	3	1.6%
a flyer/bill insert/in the mail	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	3.3%	n/a	n/a	0	0.0%	2	1.1%
the logo/the dots	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	1.1%
Yellow Pages	n/a	n/a	2	1.0%	3	1.3%	1	0.4%	5	2.0%	1	0.4%	3	1.2%	2	0.9%	2	0.9%	1	0.5%
international calling	1	0.5%	2	1.0%	n/a	n/a	7	2.7%	6	2.4%	1	0.4%	1	0.4%	1	0.4%	0	0.0%	1	0.5%
phone mart	5	2.3%	6	2.9%	2	0.9%	2	0.8%	8	3.2%	1	0.4%	1	0.4%	1	0.4%	0	0.0%	1	0.5%
can you hear me? TV ad	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	4.1%	n/a	n/a	0	0.0%	0	0.0%
beyond the call	6	2.7%	1	0.5%	4	1.7%	1	0.4%	6	2.4%	16	6.3%	n/a	n/a	2	0.9%	1	0.5%	0	0.0%
interisland calls	4	1.8%	0	0.0%	n/a	n/a	8	3.1%	6	2.4%	2	0.8%	n/a	n/a	n/a	n/a	0	0.0%	0	0.0%
change of ownership/buyout	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	4.2%	0	0.0%
it's not for AT&T it's for Verizon Hawaii	8	3.6%	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%	0	0.0%
nothing	26	11.8%	8	3.8%	8	3.4%	3	1.1%	4	1.6%	1	0.4%	6	2.4%	6	2.7%	6	2.8%	4	2.1%
other	74	33.5%	23	11.0%	120	51.5%	3	1.1%	6	2.4%	13	5.1%	15	6.1%	70	31.4%	15	7.0%	5	2.6%
don't remember	n/a	n/a	45	21.5%	27	11.6%	14	5.3%	46	18.3%	37	14.6%	38	15.4%	64	28.7%	61	28.6%	45	23.8%
Total number of respondents	221		209		233		262		252		254		246		223		213		189	

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Table C-5: Satisfaction Ratings for 2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2nd Qtr	3rd Qtr
Satisfaction with Service:												
Maui Electric												
very dissatisfied	2.2	2.0	2.4	3.1	1.8	2.2	2.6	2.7	2.7	2.0	2.0	2.0
2	4.2	5.1	5.6	4.9	3.6	2.2	3.5	4.4	4.0	4.4	3.3	5.0
3	16.2	19.6	16.2	18.0	16.4	13.5	15.6	16.7	23.7	17.5	15.9	18.3
4	25.9	36.7	30.4	32.0	33.3	33.7	34.4	26.7	24.6	29.0	34.4	26.2
very satisfied	50.4	36.0	44.9	41.8	44.9	47.2	43.6	49.1	44.5	46.7	43.0	48.5
don't know	1.0	0.7	0.4	0.2	0.0	1.1	0.2	0.4	0.7	0.4	1.3	0.0
% rating	79.9	74.6	77.1	77.0	79.7	81.0	78.1	79.4	77.3	78.7	78.7	78.6
Verizon Hawaii/Hawaiian Telcom												
very dissatisfied	2.9	2.0	2.9	3.3	3.6	2.2	3.7	3.8	8.6	7.3	6.6	7.6
2	5.2	6.9	6.4	6.0	7.6	3.3	7.9	6.9	6.2	6.0	6.0	6.0
3	21.2	24.7	24.2	19.8	24.2	22.4	22.9	23.1	25.7	25.2	21.9	26.9
4	26.5	36.0	30.0	32.0	35.1	36.4	28.6	26.2	25.4	27.0	24.5	28.2
very satisfied	43.4	28.9	35.1	36.9	28.0	33.3	34.4	38.0	29.4	30.1	35.1	27.6
don't know	0.9	1.6	1.3	2.0	1.6	2.4	2.4	2.0	4.6	4.4	6.0	3.7
% rating	75.8	71.4	71.6	74.7	70.5	75.5	71.2	73.6	67.8	68.1	70.1	66.1

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Table C-6: Corporate Image: Overall Performance Ratings for 2007
(Overall Rating)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2nd Qtr	3rd Qtr
Overall Performance: Corporate Image												
Maui Electric												
very poor	1.1	2.0	1.3	1.6	1.1	2.2	0.9	1.8	1.3	0.9	0.7	1.0
2	2.8	2.9	4.9	3.8	2.2	1.3	4.2	2.7	2.9	3.5	6.0	2.3
3	15.5	21.3	13.3	16.2	14.7	10.6	17.6	15.8	17.0	19.9	19.2	20.3
4	39.9	45.8	43.3	41.3	46.0	45.5	41.4	44.4	44.0	40.5	38.4	41.5
excellent	40.1	27.3	36.0	36.9	35.8	39.0	35.5	34.9	33.8	35.2	35.8	34.9
don't know	0.6	0.7	1.1	0.2	0.2	1.3	0.4	0.4	0.9	0.0	0.0	0.0
% rating	79.0	73.6	76.8	77.7	79.0	79.8	76.7	77.6	76.7	76.2	75.7	76.7
Verizon Hawaii/Hawaiian Telcom												
very poor	1.4	1.3	1.6	1.6	2.9	1.3	2.4	1.3	5.1	4.9	6.6	4.0
2	2.4	4.4	4.2	4.4	2.9	3.1	4.6	4.4	5.3	6.4	4.6	7.3
3	20.1	18.4	18.4	16.0	22.7	18.0	19.8	19.1	22.1	22.6	23.2	22.3
4	36.5	48.9	42.4	43.3	43.1	44.8	41.2	43.8	38.3	37.2	39.1	36.2
excellent	38.6	25.8	31.1	33.1	27.3	29.5	29.1	28.9	23.2	26.3	25.2	26.9
don't know	1.0	1.1	2.2	1.6	1.1	3.3	2.9	2.4	6.0	2.7	1.3	3.3
% rating	77.4	73.8	74.0	76.2	73.2	76.0	73.2	74.6	70.0	68.7	68.1	69.3

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Table C-7: Customer Satisfaction Rating of Maui Electric

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
5 very satisfied	34.0	51.3	47.5	50.2	48.5	50.4	36.0	44.9	41.8	44.9	47.2	43.6	49.1	44.5	46.7
4	33.3	29.4	30.9	27.4	29.9	25.9	36.7	30.4	32.0	33.3	33.7	34.4	26.7	24.6	29.0
3	25.3	15.1	15.2	16.5	15.5	16.2	19.6	16.2	18.0	16.4	13.5	15.6	16.7	23.7	17.5
2	2.7	3.2	3.6	3.1	3.6	4.2	5.1	5.6	4.9	3.6	2.2	3.5	4.4	4.0	4.4
very dissatisfied	2.0	0.8	1.3	2.1	1.4	2.2	2.0	2.4	3.1	1.8	2.2	2.6	2.7	2.7	2.0
don't know	2.7	0.3	1.5	0.8	1.2	1.0	0.7	0.4	0.2	0.0	1.1	0.2	0.4	0.7	0.4
% rating	74.3	82.0	80.4	80.4	80.5	79.9	74.6	77.1	77.0	79.7	81.0	78.1	79.4	77.3	78.7
Base	300	750	751	751	753	770	450	450	450	450	451	454	450	452	452

*Beginning in 1993, Maui Electric began asking customers to rate their overall satisfaction with services provided to them by MECO and Verizon Hawaii.

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Table C-8: Corporate Image: Overall Rating of Maui Electric

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
5 excellent	36.3	31.3	35.5	29.4	34.0	27.7	37.2	34.5	39.4	39.0	40.1	27.3	36.0	36.9	35.8	39.0	35.5	34.9	33.8	35.2
4	57.1	62.7	44.9	42.2	36.0	44.3	43.1	44.4	38.7	40.6	39.9	45.8	43.3	41.3	46.0	45.5	41.4	44.4	44.0	40.5
3	n/a	n/a	14.6	19.1	23.3	25.0	16.2	16.9	17.3	16.1	15.5	21.3	13.3	16.2	14.7	10.6	17.6	15.8	17.0	19.9
2	4.6	5.0	2.0	5.6	4.7	0.7	2.1	1.4	2.7	2.5	2.8	2.9	4.9	3.8	2.2	1.3	4.2	2.7	2.9	3.5
1 very poor	0.0	0.3	0.7	1.0	1.0	1.3	0.7	0.6	0.9	0.4	1.1	2.0	1.3	1.6	1.1	2.2	0.9	1.8	1.3	0.9
don't know	2.0	0.7	2.3	2.6	1.0	1.0	0.9	2.3	1.0	1.3	0.6	0.7	1.1	0.2	0.2	1.3	0.4	0.4	0.9	0.0
% rating	77.5	75.3	78.8	74.0	74.6	74.3	78.7	78.4	78.6	79.3	79.0	73.6	76.8	77.7	79.0	79.8	76.7	77.6	76.7	76.2
Base	303	300	301	303	300	300	750	751	751	753	770	450	450	450	450	451	454	450	452	452

% rating is based on percentage of maximum score. See Appendix B for methods used in calculating the rating. Note: The scale was changed in 1990 to a five point scale, to allow for more flexibility in responses.

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Table C-9: % Ratings for Utilities

	OVERALL								2ND QUARTER								3RD QUARTER								4TH QUARTER							
	2007	2006	2005	2004	2003	2002	2001	2000	2007	2006	2005	2004	2003	2002	2001	2000	2007	2006	2005	2004	2003	2002	2001	2000	2007	2006	2005	2004	2003	2002	2001	2000
Maui Electric																																
reliable service	80.7	78.6	82.6	80.1	82.0	81.9	80.7	80.7	80.9	76.4	83.2	79.4	81.1	81.7	83.8	80.2	80.4	80.7	81.9	80.7	82.9	82.1	77.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	81.1
low cost	42.1	39.6	41.0	43.1	51.2	46.6	42.4	44.2	43.8	41.1	40.2	41.5	51.8	48.0	43.2	43.8	40.3	38.0	41.7	44.7	50.6	45.2	41.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44.6
fast response to trouble calls	75.4	76.4	76.7	73.6	76.9	77.4	74.9	77.0	75.6	76.2	76.2	71.8	76.2	78.3	77.2	76.4	75.1	76.5	77.2	75.3	77.5	76.4	72.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	77.5
uninterrupted service	75.3	73.0	78.1	75.1	78.7	78.0	75.6	76.4	74.8	69.7	79.6	72.7	77.1	79.2	79.2	76.2	75.8	76.2	76.5	77.4	80.3	76.8	72.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	76.5
friendly employees	81.8	81.7	82.9	78.3	85.9	81.6	84.3	79.9	82.0	82.3	83.7	76.9	88.7	81.1	87.0	79.7	81.5	81.1	82.1	79.6	83.1	82.0	81.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	80.0
fast recovery after storms	75.0	76.9	78.5	76.2	75.4	77.8	77.3	77.8	73.8	75.2	80.6	74.5	72.2	78.3	78.0	76.7	76.1	78.6	76.4	77.9	78.6	77.2	76.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	78.8
accurate billing	83.0	79.6	79.9	80.3	80.4	82.5	81.7	82.4	83.7	80.7	81.4	79.1	81.8	83.2	83.0	82.7	82.2	78.4	78.4	81.4	79.0	81.7	80.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	82.0
good things they do to benefit island's residents	68.4	67.7	69.9	70.2	74.5	70.3	70.2	71.7	69.1	70.1	72.6	73.9	76.2	70.2	71.4	71.9	67.7	65.3	67.1	66.4	72.7	70.3	69.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	71.4
corporate image	76.2	76.7	77.6	76.7	79.8	79.0	77.7	76.8	75.7	76.3	78.8	76.5	79.6	80.7	79.3	75.2	76.7	77.0	76.3	76.8	80.0	77.2	76.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	78.3
Verizon Hawaii/Hawaiian Telcom																																
reliable service	74.3	74.6	80.1	78.1	81.2	78.8	81.1	78.7	74.2	78.6	83.6	78.2	83.7	80.7	82.9	77.2	74.4	70.6	76.6	77.9	78.7	76.9	79.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	80.2
low cost	51.9	51.8	52.8	54.2	55.4	52.8	54.9	52.1	52.9	56.3	52.3	54.4	58.1	56.4	55.6	50.2	50.9	47.2	53.3	54.0	52.7	49.2	54.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	53.9
fast response to trouble calls	62.5	66.4	70.3	69.2	73.0	68.2	69.3	71.9	62.8	71.0	70.9	70.9	78.3	70.2	68.9	69.8	62.2	61.7	69.7	67.5	67.7	66.1	69.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	74.0
uninterrupted service	75.7	77.4	79.8	77.3	81.0	79.9	83.7	80.2	75.4	80.1	81.2	77.6	83.5	81.5	86.0	80.0	75.9	74.7	78.3	76.9	78.4	78.3	81.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	80.4
friendly employees	74.2	74.4	79.2	76.7	84.5	78.9	80.5	77.3	75.4	77.3	80.7	77.7	88.6	81.8	82.3	77.1	73.0	71.4	77.7	75.6	80.4	75.9	78.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	77.5
fast recovery after storms	73.3	75.1	79.0	76.0	77.2	77.2	78.2	78.4	73.4	76.5	81.2	76.8	77.4	80.6	79.5	77.0	73.1	73.7	76.7	75.1	77.0	73.7	76.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	79.8
accurate billing	67.4	68.1	78.0	74.8	76.0	73.4	78.0	73.6	67.8	78.7	80.9	75.7	79.2	73.8	78.4	73.9	66.9	57.4	75.1	73.8	72.7	72.9	77.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	73.3
good things they do to benefit island's residents	55.7	56.7	60.0	59.9	66.4	60.9	65.6	66.7	55.9	63.4	63.2	66.2	72.0	63.2	67.4	68.0	55.5	49.9	56.8	53.6	60.7	58.5	63.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	85.3
corporate image	68.7	70.0	74.6	73.2	76.0	73.2	76.2	74.0	68.1	74.7	75.8	73.3	78.0	75.3	77.0	71.0	69.3	65.2	73.4	73.0	74.0	71.1	75.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	76.9

% Satisfaction with Service and Value Received

	OVERALL								2ND QUARTER								3RD QUARTER								4TH QUARTER							
	2007	2006	2005	2004	2003	2002	2001	2000	2007	2006	2005	2004	2003	2002	2001	2000	2007	2006	2005	2004	2003	2002	2001	2000	2007	2006	2005	2004	2003	2002	2001	2000
Maui Electric																																
satisfaction with service	78.7	77.3	79.4	78.1	81.0	79.7	77.0	77.1	78.7	80.5	80.8	77.5	81.9	81.8	79.2	75.5	78.6	74.1	77.9	78.6	80.1	77.6	74.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	78.6
value of electricity	73.2	66.8	71.8	69.7	75.3	73.8	76.5	74.6	72.6	67.0	70.7	64.9	74.5	74.1	77.6	70.5	73.7	66.5	72.8	74.4	76.1	73.4	75.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	78.6
Verizon Hawaii/Hawaiian Telcom																																
satisfaction with service	68.1	67.8	73.6	71.2	75.5	70.5	74.7	71.6	70.1	73.3	77.0	71.6	79.0	73.7	77.4	69.3	66.1	62.2	70.1	70.7	72.0	67.3	71.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	73.8
value of telephone service	65.4	66.1	66.8	69.0	72.3	70.0	77.5	70.8	66.8	67.7	65.5	67.5	74.0	71.6	79.1	65.2	64.0	64.6	68.1	70.5	70.6	68.3	75.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	76.3

% rating is based on percentage of maximum score. See Appendix B for methods used in calculating the rating. Note: The scale was changed in 1990 to a five point scale, to allow for more flexibility in responses.

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Table C-10: Level of Agreement with Statements about Maul Electric

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Basically honest on need to increase rates																				
agree	158	51.0%	144	48.0%	163	54.3%	149	49.7%	148	49.3%	161	53.5%	172	56.6%	167	55.7%	155	51.7%	157	52.2%
disagree	110	35.5%	118	39.3%	92	30.7%	103	34.3%	87	29.0%	75	24.9%	98	32.2%	96	32.0%	113	37.7%	91	30.2%
don't know	42	13.5%	38	12.7%	45	15.0%	48	16.0%	65	21.7%	65	21.6%	34	11.2%	37	12.3%	32	10.7%	53	17.6%
Committed to providing quality service																				
agree	263	84.8%	250	83.3%	262	87.3%	247	82.3%	258	86.0%	250	83.1%	274	90.1%	256	85.3%	255	85.0%	260	86.4%
disagree	35	11.3%	32	10.7%	25	8.3%	33	11.0%	21	7.0%	21	7.0%	19	6.3%	27	9.0%	34	11.3%	25	8.3%
don't know	12	3.9%	18	6.0%	13	4.3%	20	6.7%	21	7.0%	30	10.0%	11	3.6%	17	5.7%	11	3.7%	16	5.3%
Telling truth about outages																				
agree	225	72.6%	201	67.0%	218	72.7%	224	74.7%	222	74.0%	229	76.1%	243	79.9%	230	76.7%	235	78.3%	229	76.1%
disagree	51	16.5%	59	19.7%	41	13.7%	46	15.3%	35	11.7%	30	10.0%	35	11.5%	38	12.7%	42	14.0%	35	11.6%
don't know	34	11.0%	40	13.3%	41	13.7%	30	10.0%	43	14.3%	42	14.0%	26	8.6%	32	10.7%	23	7.7%	37	12.3%
Doing best to protect environment																				
agree	174	56.1%	234	52.0%	250	55.6%	223	49.6%	243	54.0%	240	53.2%	236	52.0%	249	55.3%	245	54.2%	248	54.9%
disagree	92	29.7%	130	28.9%	126	28.0%	159	35.3%	122	27.1%	99	22.0%	130	28.6%	130	28.9%	130	28.8%	126	27.9%
don't know	44	14.2%	86	19.1%	74	16.4%	68	15.1%	85	18.9%	112	24.8%	88	19.4%	71	15.8%	77	17.0%	78	17.3%
Helps its customers to conserve energy																				
agree	235	75.8%	228	76.0%	227	75.7%	221	73.7%	225	75.0%	211	70.1%	230	75.7%	213	71.0%	222	74.0%	237	78.7%
disagree	55	17.7%	52	17.3%	53	17.7%	62	20.7%	44	14.7%	45	15.0%	59	19.4%	70	23.3%	66	22.0%	47	15.6%
don't know	20	6.5%	20	6.7%	20	6.7%	17	5.7%	31	10.3%	45	15.0%	15	4.9%	17	5.7%	12	4.0%	17	5.6%
Only time you hear about electric company is when they raise rates																				
agree	132	42.6%	115	38.3%	102	34.0%	143	47.7%	113	37.7%	114	37.9%	106	34.9%	126	42.0%	110	36.7%	113	37.5%
disagree	165	53.2%	166	55.3%	183	61.0%	144	48.0%	157	52.3%	152	50.5%	188	61.8%	156	52.0%	180	60.0%	173	57.5%
don't know	13	4.2%	19	6.3%	15	5.0%	13	4.3%	30	10.0%	35	11.6%	10	3.3%	18	6.0%	10	3.3%	15	5.0%
Doesn't really give anything back																				
agree	62	20.0%	67	22.3%	54	18.0%	62	20.7%	55	18.3%	38	12.6%	59	19.4%	59	19.7%	55	18.3%	50	16.6%
disagree	184	59.4%	170	56.7%	203	67.7%	193	64.3%	170	56.7%	167	55.5%	196	64.5%	186	62.0%	202	67.3%	185	61.5%
don't know	64	20.6%	63	21.0%	43	14.3%	45	15.0%	75	25.0%	96	31.9%	49	16.1%	55	18.3%	43	14.3%	66	21.9%
Doing best to encourage alternate energy sources																				
agree	166	53.5%	146	48.7%	150	50.0%	140	46.7%	142	47.3%	149	49.5%	141	46.4%	143	47.7%	174	58.0%	183	60.8%
disagree	81	26.1%	89	29.7%	90	30.0%	106	35.3%	79	26.3%	68	22.6%	103	33.9%	104	34.7%	98	32.7%	72	23.9%
don't know	63	20.3%	65	21.7%	60	20.0%	54	18.0%	79	26.3%	84	27.9%	60	19.7%	53	17.7%	28	9.3%	46	15.3%

Table C-11: Level of Agreement with Statements about Electric Company

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
The electric company is basically honest when they give reasons for needing to increase rates.										
agree	51.0%	48.0%	54.3%	49.7%	49.3%	53.5%	56.6%	55.7%	51.7%	52.2%
disagree	35.5%	39.3%	30.7%	34.3%	29.0%	24.9%	32.2%	32.0%	37.7%	30.2%
don't know	13.5%	12.7%	15.0%	16.0%	21.7%	21.6%	11.2%	12.3%	10.7%	17.6%
The electric company is committed to providing quality service.										
agree	84.8%	83.3%	87.3%	82.3%	86.0%	83.1%	90.1%	85.3%	85.0%	86.4%
disagree	11.3%	10.7%	8.3%	11.0%	7.0%	7.0%	6.3%	9.0%	11.3%	8.3%
don't know	3.9%	6.0%	4.3%	6.7%	7.0%	10.0%	3.6%	5.7%	3.7%	5.3%
The electric company is telling the truth when they explain the reasons for power outages.										
agree	72.6%	67.0%	72.7%	74.7%	74.0%	76.1%	79.9%	76.7%	78.3%	76.1%
disagree	16.5%	19.7%	13.7%	15.3%	11.7%	10.0%	11.5%	12.7%	14.0%	11.6%
don't know	11.0%	13.3%	13.7%	10.0%	14.3%	14.0%	8.6%	10.7%	7.7%	12.3%
The electric company is doing its best to encourage using energy sources that don't use oil.										
agree	53.5%	48.7%	50.0%	46.7%	47.3%	49.5%	46.4%	47.7%	58.0%	60.8%
disagree	26.1%	29.7%	30.0%	35.3%	26.3%	22.6%	33.9%	34.7%	32.7%	23.9%
don't know	20.3%	21.7%	20.0%	18.0%	26.3%	27.9%	19.7%	17.7%	9.3%	15.3%
Base	310	300	300	300	300	301	304	300	300	301
The electric company is doing its best to protect the environment in all of its operations.										
agree	56.8%	52.0%	55.6%	49.6%	54.0%	53.2%	52.0%	55.3%	54.2%	54.9%
disagree	24.8%	28.9%	28.0%	35.3%	27.1%	22.0%	28.6%	28.9%	28.8%	27.9%
don't know	18.4%	19.1%	16.4%	15.1%	18.9%	24.8%	19.4%	15.8%	17.0%	17.3%
Base	770	450	450	450	450	451	454	450	452	452

Table C-12: Other Perceptions of MECO

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Fairness of rates																				
very unfair	18	5.8%	21	7.0%	20	6.7%	25	8.3%	17	5.7%	17	5.6%	28	9.2%	29	9.7%	50	16.7%	31	10.3%
2	16	5.2%	20	6.7%	29	9.7%	36	12..0%	16	5.3%	21	7.0%	26	8.6%	33	11.0%	32	10.7%	27	9.0%
3	40	12.9%	38	12.7%	45	15.0%	37	12.3%	55	18.3%	45	15.0%	48	15.8%	46	15.3%	47	15.7%	49	16.3%
4	71	22.9%	80	26.7%	59	19.7%	60	20.0%	76	25.3%	61	20.3%	58	19.1%	50	16.7%	64	21.3%	54	17.9%
5	87	28.1%	82	27.3%	92	30.7%	87	29.0%	80	26.7%	109	36.2%	88	28.9%	69	23.0%	55	18.3%	77	25.6%
6	23	7.4%	30	10.0%	22	7.3%	19	6.3%	23	7.7%	22	7.3%	26	8.6%	34	11.3%	22	7.3%	29	9.6%
very fair	36	11.6%	15	5.0%	21	7.0%	24	8.0%	19	6.3%	13	4.3%	17	5.6%	24	8.0%	21	7.0%	14	4.7%
don't know	19	6.1%	14	4.7%	12	4.0%	12	4.0%	14	4.7%	13	4.3%	13	4.3%	15	5.0%	9	3.0%	20	6.6%
% rating		56.6%		52.7%		52.1%		50.8%		52.6%		53.1%		50.4%		50.6%		44.3%		48.9%
Concern for customers																				
not concerned	14	4.5%	9	3.0%	9	3.0%	23	7.7%	9	3.0%	7	2.3%	12	3.9%	25	8.3%	23	7.7%	7	2.3%
2	13	4.2%	9	3.0%	16	5.3%	14	4.7%	13	4.3%	14	4.7%	15	4.9%	8	2.7%	22	7.3%	11	3.7%
3	30	9.7%	41	13.7%	33	11.0%	28	9.3%	16	5.3%	24	8.0%	33	10.9%	38	12.7%	32	10.7%	39	13.0%
4	44	14.2%	60	20.0%	50	16.7%	59	19.7%	39	13.0%	52	17.3%	53	17.4%	42	14.0%	50	16.7%	52	17.3%
5	86	27.7%	93	31.0%	74	24.7%	87	29.0%	56	18.7%	87	28.9%	83	27.3%	69	23.0%	66	22.0%	74	24.6%
6	50	16.1%	48	16.0%	50	16.7%	45	15.0%	81	27.0%	59	19.6%	50	16.4%	54	18.0%	45	15.0%	50	16.6%
very concerned	56	18.1%	34	11.3%	54	18.0%	36	12.0%	50	16.7%	45	15.0%	50	16.4%	49	16.3%	49	16.3%	50	16.6%
don't know	17	5.5%	6	2.0%	14	4.7%	8	2.7%	36	12.0%	13	4.3%	8	2.6%	15	5.0%	13	4.3%	18	6.0%
% rating		61.5%		60.6%		64.2%		59.1%		61.1%		65.5%		63.2%		61.4%		59.2%		64.3%
Work to help keep bills down																				
very poor	21	6.8%	17	5.7%	12	4.0%	28	9.3%	15	5.0%	18	6.0%	24	7.9%	32	10.7%	29	9.7%	26	8.6%
2	24	7.7%	27	9.0%	34	11.3%	23	7.7%	20	6.7%	20	6.6%	28	9.2%	25	8.3%	31	10.3%	24	8.0%
3	33	10.6%	32	10.7%	39	13.0%	37	12.3%	22	7.3%	42	14.0%	46	15.1%	38	12.7%	39	13.0%	43	14.3%
4	55	17.7%	51	17.0%	51	17.0%	60	20.0%	48	16.0%	45	15.0%	47	15.5%	45	15.0%	44	14.7%	40	13.3%
5	72	23.2%	84	28.0%	58	19.3%	63	21.0%	57	19.0%	63	20.9%	72	23.7%	67	22.3%	69	23.0%	73	24.3%
6	34	11.0%	39	13.0%	41	13.7%	38	12.7%	74	24.7%	50	16.6%	38	12.5%	34	11.3%	34	11.3%	36	12.0%
very good	43	13.9%	24	8.0%	40	13.3%	30	10.0%	44	14.7%	35	11.6%	27	8.9%	34	11.3%	29	9.7%	24	8.0%
don't know	28	9.0%	26	8.7%	25	8.3%	21	7.0%	20	6.7%	28	9.3%	22	7.2%	25	8.3%	25	8.3%	35	11.6%
% rating		52.9%		51.8%		57.1%		53.7%		55.1%		58.1%		53.3%		53.2%		52.2%		53.0%

Table C-13: Other Perceptions of Electric Company

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fairness of rates										
very unfair	5.8	7.0	6.7	8.3	5.7	5.6	9.2	9.7	16.7	10.3
2	5.2	6.7	9.7	12.0	5.3	7.0	8.6	11.0	10.7	9.0
3	12.9	12.7	15.0	12.3	18.3	15.0	15.8	15.3	15.7	16.3
4	22.9	26.7	19.7	20.0	25.3	20.3	19.1	16.7	21.3	17.9
5	28.1	27.3	30.7	29.0	26.7	36.2	28.9	23.0	18.3	25.6
6	7.4	10.0	7.3	6.3	7.7	7.3	8.6	11.3	7.3	9.6
very fair	11.6	5.0	7.0	8.0	6.3	4.3	5.6	8.0	7.0	4.7
don't know	6.1	4.7	4.0	4.0	4.7	4.3	4.3	5.0	3.0	6.6
% rating	56.6	52.7	52.1	50.8	52.6	53.1	50.4	50.6	44.3	48.9
Concern about customers										
not at all concerned	4.5	3.0	3.0	7.7	3.0	2.3	3.9	8.3	7.7	2.3
2	4.2	3.0	5.3	4.7	4.3	4.7	4.9	2.7	7.3	3.7
3	9.7	13.7	11.0	9.3	5.3	8.0	10.9	12.7	10.7	13.0
4	14.2	20.0	16.7	19.7	13.0	17.3	17.4	14.0	16.7	17.3
5	27.7	31.0	24.7	29.0	18.7	28.9	27.3	23.0	22.0	24.6
6	16.1	16.0	16.7	15.0	27.0	19.6	16.4	18.0	15.0	16.6
very concerned	18.1	11.3	18.0	12.0	16.7	15.0	16.4	16.3	16.3	16.6
don't know	5.5	2.0	4.7	2.7	12.0	4.3	2.6	5.0	4.3	6.0
% rating	61.5	60.6	64.2	59.1	61.1	65.5	63.2	61.4	59.2	64.3
Working with customers to keep electric bills down										
very poor	6.8	5.7	4.0	9.3	5.0	6.0	7.9	10.7	9.7	8.6
2	7.7	9.0	11.3	7.7	6.7	6.6	9.2	8.3	10.3	8.0
3	10.6	10.7	13.0	12.3	7.3	14.0	15.1	12.7	13.0	14.3
4	17.7	17.0	17.0	20.0	16.0	15.0	15.5	15.0	14.7	13.3
5	23.2	28.0	19.3	21.0	19.0	20.9	23.7	22.3	23.0	24.3
6	11.0	13.0	13.7	12.7	24.7	16.6	12.5	11.3	11.3	12.0
very good	13.9	8.0	13.3	10.0	14.7	11.6	8.9	11.3	9.7	8.0
don't know	9.0	8.7	8.3	7.0	6.7	9.3	7.2	8.3	8.3	11.6
% rating	52.9	51.8	57.1	53.7	55.1	58.1	53.3	53.2	52.2	53.0

% Rating is based on maximum of 100. See Appendix B for methods used in calculating the %.

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Table C-14: Perceived Value for the Money of Utility Services

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Value for money of electric										
very poor	3.3%	2.9%	1.6%	3.1%	2.4%	3.1%	2.0%	4.0%	5.8%	2.7%
2	6.1%	8.7%	6.2%	4.4%	7.1%	5.3%	7.2%	8.2%	11.3%	8.4%
3	20.7%	19.1%	20.4%	19.3%	19.6%	16.2%	18.8%	19.1%	23.2%	20.6%
4	27.9%	32.2%	27.3%	30.0%	33.1%	31.9%	33.6%	27.8%	25.4%	26.5%
excellent	38.0%	32.4%	41.1%	41.8%	35.8%	38.4%	36.8%	36.4%	30.8%	38.9%
don't know	4.0%	4.7%	3.3%	1.3%	2.0%	5.1%	1.6%	4.4%	3.5%	2.9%
% rating	73.7%	71.7%	74.6%	76.5%	73.8%	75.3%	69.7%	71.8%	66.8%	73.2%
Value for money of telephone										
very poor	2.9%	3.3%	2.4%	1.3%	2.2%	2.9%	3.9%	4.0%	4.6%	4.9%
2	7.2%	6.4%	7.8%	5.3%	8.7%	6.0%	6.3%	9.6%	8.8%	11.3%
3	19.6%	24.9%	21.3%	18.4%	25.8%	24.4%	22.4%	25.6%	27.0%	25.9%
4	26.3%	33.1%	29.8%	32.4%	34.0%	29.7%	34.5%	29.3%	29.0%	28.1%
excellent	40.3%	29.6%	34.9%	40.7%	27.6%	32.6%	29.3%	27.1%	23.7%	25.0%
don't know	3.9%	2.7%	3.8%	1.8%	1.8%	4.4%	3.6%	4.4%	6.9%	4.9%
% rating	74.4%	70.0%	70.8%	77.5%	70.0%	72.3%	69.0%	66.8%	66.1%	65.4%

Table C-15: What is the one thing that MECO does that is the most benefit to the community?

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
MECO's benefit to the community:																				
community projects and service, event sponsorship	27	8.7%	18	6.0%	40	13.3%	35	11.7%	28	9.3%	16	5.3%	21	6.9%	29	9.7%	39	13.0%	33	11.0%
alternate energy sources, environmental help	7	2.3%	8	2.7%	20	6.7%	13	4.3%	17	5.7%	12	4.0%	23	7.6%	18	6.0%	43	14.3%	29	9.6%
provide information on conservation, energy savings	8	2.6%	9	3.0%	16	5.3%	11	3.7%	15	5.0%	12	4.0%	18	5.9%	16	5.3%	9	3.0%	27	9.0%
provide jobs	24	8.4%	39	13.0%	23	7.7%	55	18.3%	49	16.3%	77	25.6%	27	8.9%	18	6.0%	19	6.3%	17	5.6%
just provide power, light	55	17.7%	45	15.0%	38	12.7%	38	12.7%	46	15.3%	54	17.9%	35	11.5%	43	14.3%	33	11.0%	11	3.7%
education of public - bill inserts, newsletter	2	0.6%	7	2.3%	6	2.0%	8	2.7%	4	1.3%	3	1.0%	4	1.3%	5	1.7%	6	2.0%	9	3.0%
education of kids, safety, McGruff truck	17	5.5%	20	6.7%	16	5.3%	11	3.7%	7	2.3%	19	6.3%	11	3.6%	7	2.3%	7	2.3%	8	2.7%
cooking, recipes	1	0.3%	2	0.7%	0	0.0%	0	0.0%	2	0.7%	4	1.3%	4	1.3%	5	1.7%	4	1.3%	4	1.3%
clean up after storm	5	1.6%	3	1.0%	2	0.7%	2	0.7%	1	0.3%	3	1.0%	6	2.0%	2	0.7%	2	0.7%	2	0.7%
employees donating time	3	1.0%	0	0.0%	1	0.3%	0	0.0%	1	0.3%	0	0.0%	2	0.7%	0	0.0%	4	1.3%	1	0.3%
build, help economy	4	1.3%	4	1.3%	5	1.7%	4	1.3%	11	3.7%	2	0.7%	0	0.0%	3	1.0%	2	0.7%	1	0.3%
American safety	1	0.3%	2	0.7%	3	1.0%	1	0.3%	0	0.0%	0	0.0%	1	0.3%	0	0.0%	1	0.3%	1	0.3%
other	21	6.8%	3	1.0%	12	4.0%	1	0.3%	12	4.0%	0	0.0%	12	3.9%	5	1.7%	8	2.7%	9	3.0%
nothing	15	4.8%	7	2.3%	11	3.7%	13	4.3%	3	1.0%	4	1.3%	10	3.3%	19	6.3%	17	5.7%	8	2.7%
no opinion	6	1.9%	9	3.0%	7	2.3%	2	0.7%	6	2.0%	11	3.7%	4	1.3%	2	0.7%	1	0.3%	0	0.0%
don't know	112	36.1%	124	41.3%	100	33.3%	106	35.3%	98	32.7%	84	27.9%	126	41.4%	128	42.7%	105	35.0%	141	46.8%

Table C-16: Value of Consumer Lines

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Have you seen Consumer Lines?																				
yes	192	61.9%	203	67.7%	229	76.3%	207	69.0%	210	70.0%	176	58.5%	201	66.1%	213	71.0%	211	70.3%	203	67.4%
no	112	36.1%	91	30.3%	66	22.0%	88	29.3%	84	28.0%	122	40.5%	96	31.6%	82	27.3%	82	27.3%	92	30.6%
don't know	6	1.9%	6	2.0%	5	1.7%	5	1.7%	6	2.0%	3	1.0%	7	2.3%	5	1.7%	7	2.3%	6	2.0%
Do you usually read it?																				
all	49	25.5%	31	15.3%	51	22.3%	37	17.9%	35	16.7%	17	9.7%	22	10.9%	45	21.1%	44	20.9%	48	23.6%
some of it	76	39.6%	74	36.5%	103	45.0%	107	51.7%	88	41.9%	78	44.3%	112	55.7%	94	44.1%	84	39.8%	81	39.9%
a little of it	27	14.1%	64	31.5%	39	17.0%	31	15.0%	50	23.8%	42	23.9%	39	19.4%	38	17.8%	43	20.4%	44	21.7%
not at all	40	20.8%	33	16.3%	35	15.3%	31	15.0%	34	16.2%	39	22.2%	27	13.4%	35	16.4%	38	18.0%	29	14.3%
don't know	0	0.0%	1	0.5%	1	0.4%	1	0.5%	3	1.4%	0	0.0%	1	0.5%	1	0.5%	2	0.9%	1	0.5%
What do you remember in Consumer Lines?																				
save energy	32	21.1%	63	37.3%	71	36.8%	66	37.7%	79	45.7%	65	47.4%	68	39.3%	82	46.3%	59	34.5%	70	40.5%
recipes	46	30.3%	54	32.0%	83	43.0%	93	53.1%	56	32.4%	54	39.4%	49	28.3%	60	33.9%	60	35.1%	57	32.9%
solar power program	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	18	10.4%	0	0.0%	38	22.2%	29	16.8%
rate increase, explanations	5	3.3%	9	5.3%	9	4.7%	11	6.3%	8	4.6%	11	8.0%	6	3.5%	6	3.4%	3	1.8%	6	3.5%
wind power	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	4.7%	5	2.9%
Information about CFL's	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5	2.9%
hurricane and storm tips	3	2.0%	13	7.7%	14	7.3%	11	6.3%	19	11.0%	9	6.6%	2	1.2%	7	4.0%	8	4.7%	4	2.3%
safety practices	13	8.6%	16	9.5%	21	10.9%	8	4.6%	9	5.2%	6	4.4%	5	2.9%	5	7.3%	14	8.2%	3	1.7%
other	21	13.8%	20	11.8%	4	2.1%	8	4.6%	7	4.0%	5	3.6%	11	6.4%	13	7.3%	8	4.7%	12	6.9%
nothing specific	5	3.3%	17	10.1%	27	14.0%	8	4.6%	13	7.5%	8	5.8%	9	5.2%	13	7.3%	4	2.3%	17	9.8%
don't know	53	34.9%	36	21.3%	24	12.4%	25	14.3%	33	19.1%	25	18.2%	46	26.6%	41	23.2%	36	21.1%	34	19.7%

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Table C-17: Value of Pamphlets in Monthly Bill

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Have you seen the newsletter, Consumer Lines, that is enclosed with your monthly electric bill?*										
yes	61.9%	67.7%	76.3%	69.0%	70.0%	58.5%	66.1%	71.0%	70.3%	67.4%
no	36.1%	30.3%	22.0%	29.3%	28.0%	40.5%	31.6%	27.3%	27.3%	30.6%
don't know	1.9%	2.0%	1.7%	1.7%	2.0%	1.0%	2.3%	1.7%	2.3%	2.0%
Base	310	300	300	300	300	301	304	300	300	301
Do you usually read all of these pamphlets, most of them, some of them, a little or do you not read them at all? **										
all of them	25.5%	15.3%	22.3%	17.9%	16.7%	9.7%	10.9%	21.1%	20.9%	23.6%
some of them	39.6%	36.5%	45.0%	51.7%	41.9%	44.3%	55.7%	44.1%	39.8%	39.9%
a little	14.1%	31.5%	17.0%	15.0%	23.8%	23.9%	19.4%	17.8%	20.4%	21.7%
not at all	20.8%	16.3%	15.3%	15.0%	16.2%	22.2%	13.4%	16.4%	18.0%	14.3%
don't know	0.0%	0.5%	0.4%	0.5%	1.4%	0.0%	0.5%	0.5%	0.9%	0.5%
Base	192	203	229	207	210	176	201	213	211	203

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Table C-18: Knowledge and Concern about EMF

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Heard or read about EMF?																				
yes	131	42.3%	128	42.7%	124	41.3%	109	36.3%	123	41.0%	111	36.9%	91	29.9%	125	41.7%	110	36.7%	123	40.9%
no	173	55.8%	165	55.0%	173	57.7%	189	63.0%	166	55.3%	179	59.5%	212	69.7%	170	56.7%	189	63.0%	175	58.1%
don't know	6	1.9%	7	2.3%	3	1.0%	2	0.7%	11	3.7%	11	3.7%	1	0.3%	5	1.7%	1	0.3%	3	1.0%
How much of a threat is EMF?																				
very serious threat	49	15.8%	28	9.3%	40	13.3%	27	9.0%	48	16.0%	30	10.0%	14	15.4%	22	17.6%	18	16.4%	16	13.0%
somewhat serious threat	68	21.9%	82	27.3%	82	27.3%	56	18.7%	96	32.0%	77	25.6%	27	29.7%	40	32.0%	29	26.4%	42	34.1%
not too serious	65	21.0%	90	30.0%	81	27.0%	83	27.7%	83	27.7%	58	19.3%	38	41.8%	33	26.4%	42	38.2%	36	29.3%
not a threat at all	65	21.0%	70	23.3%	69	23.0%	97	32.3%	37	12.3%	78	25.9%	9	9.9%	27	21.6%	18	16.4%	21	17.1%
don't know	63	20.3%	30	10.0%	28	9.3%	37	12.3%	36	12.0%	58	19.3%	3	3.3%	3	2.4%	3	2.7%	8	6.5%

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Table C-19: Cost Savings and Informational Programs

	2000 Annual		2001 Annual		2002 Annual		2003 Annual		2004 Annual		2005 Annual		2006 Annual		2007 Annual		2nd Qtr 2007		3rd Qtr 2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Are you aware of any recent cost saving or informational programs offered by Maui Electric?																				
Yes	178	39.6%	171	38.0%	192	42.7%	181	40.1%	197	43.4%	182	40.4%	175	38.7%	165	36.5%	52	34.4%	113	37.5%
No	266	59.1%	272	60.4%	254	56.4%	260	57.6%	245	54.0%	262	58.2%	268	59.3%	275	60.8%	91	60.3%	184	61.1%
Don't Know	6	1.3%	7	1.6%	4	0.9%	10	2.2%	12	2.6%	6	1.3%	9	2.0%	12	2.7%	8	5.3%	4	1.3%
Which ones do you remember?																				
Solar rebate program	127	28.2%	137	30.4%	156	34.7%	155	34.4%	139	30.6%	129	28.7%	125	27.7%	110	24.3%	38	25.2%	72	23.9%
Conservation messages	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14	3.1%	25	5.5%	21	4.6%	7	4.6%	14	4.7%
CFL light bulb rebate	18	4.0%	22	4.9%	13	2.9%	8	1.8%	25	5.5%	8	1.8%	13	2.9%	18	4.0%	3	2.0%	15	5.0%
Wind mills/wind power	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13	2.9%	8	5.3%	5	1.7%
Low income assistance program	—	—	—	—	—	—	—	—	—	—	—	—	6	1.3%	8	1.8%	3	2.0%	5	1.7%
Efficient appliances/Energy Star	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	0.9%	0	0.0%	4	1.3%
Coupon program for $20 off A/C	33	7.3%	11	2.4%	21	4.7%	22	4.9%	9	2.0%	8	1.8%	4	0.9%	4	0.9%	1	0.7%	3	1.0%
Energy Scout	—	—	—	—	—	—	—	—	—	—	5	1.1%	3	0.7%	3	0.7%	0	0.0%	3	1.0%
Sun Power for Schools	7	1.6%	4	0.9%	6	1.3%	6	1.3%	2	0.4%	9	2.0%	2	0.4%	1	0.2%	1	0.7%	0	0.0%
Emergency Prep. Handbook	*6*	*1.3%*	*4*	*0.9%*	*4*	*0.9%*	*13*	*2.9%*	*1*	*0.2%*	*3*	*0.7%*	*0*	*0.0%*	*1*	*0.2%*	*1*	*0.7%*	*0*	*0.0%*
Showerhead	5	1.1%	12	2.7%	5	1.1%	3	0.7%	2	0.4%	1	0.2%	1	0.2%	0	0.0%	0	0.0%	0	0.0%
Other	18	4.0%	13	2.9%	18	4.0%	8	1.8%	38	8.4%	23	5.1%	19	4.2%	15	3.3%	10	6.6%	5	1.7%
Don't Know	9	2.0%	6	1.3%	6	1.3%	9	2.0%	20	4.4%	16	3.6%	11	2.4%	10	2.2%	1	0.7%	9	3.0%
Where do you remember seeing this offer?																				
Bill Insert	89	19.8%	87	19.3%	79	17.6%	100	22.2%	90	19.8%	79	17.6%	82	18.1%	73	16.2%	23	15.2%	50	16.6%
Newspaper	32	7.1%	41	9.1%	57	12.7%	39	8.6%	57	12.6%	53	11.8%	62	13.7%	57	12.6%	19	12.6%	38	12.6%
Word of Mouth	25	5.6%	17	3.8%	22	4.9%	13	2.9%	14	3.1%	27	6.0%	23	5.1%	21	4.6%	5	3.3%	16	5.3%
Television	14	3.1%	17	3.8%	26	5.8%	33	7.3%	20	4.4%	21	4.7%	14	3.1%	20	4.4%	4	2.6%	16	5.3%
Other	14	3.1%	2	0.4%	20	4.4%	6	1.3%	20	4.4%	20	4.4%	10	2.2%	20	4.4%	10	6.6%	10	3.3%
Radio	11	2.4%	7	1.6%	14	3.1%	8	1.8%	12	2.6%	7	1.6%	6	1.3%	7	1.5%	1	0.7%	6	2.0%
Don't Know	5	1.1%	7	1.6%	6	1.3%	13	2.9%	9	2.0%	9	2.0%	9	2.0%	6	1.3%	1	0.7%	5	1.7%
Direct Mail	17	3.8%	24	5.3%	20	4.4%	10	2.2%	12	2.6%	7	1.6%	6	1.3%	5	1.1%	2	1.3%	3	1.0%
Magazine	0	0.0%	1	0.2%	1	0.2%	2	0.4%	0	0.0%	2	0.4%	3	0.7%	1	0.2%	0	0.0%	1	0.3%

Table C-20: Recent Power Outages

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Has the power in your neighborhood gone off in last 6 months?																				
yes	232	74.8%	185	61.7%	163	54.3%	289	64.2%	258	57.3%	233	51.7%	300	66.1%	243	54.0%	299	66.2%	287	63.5%
no	66	21.3%	115	38.3%	137	45.7%	161	35.8%	192	42.6%	218	48.4%	146	32.1%	189	42.0%	149	33.0%	149	33.0%
don't know	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	1.8%	18	4.0%	4	0.9%	16	3.5%
Was that just for a *few minutes*, or was it for a *much longer time*?																				
just a few minutes	75	32.3%	96	51.9%	83	50.9%	126	43.6%	127	49.2%	112	48.1%	89	29.7%	93	38.3%	104	34.8%	106	36.9%
longer period	143	61.6%	79	42.7%	73	44.8%	143	49.5%	116	45.0%	113	48.5%	195	65.0%	138	56.8%	173	57.9%	164	57.1%
don't know	14	6.0%	10	5.4%	7	4.3%	20	6.9%	15	5.8%	8	3.4%	16	5.3%	12	4.9%	22	7.4%	17	5.9%
Were you satisfied with the electric company's handling of the problem?																				
yes	182	78.4%	148	80.0%	131	80.4%	238	82.4%	216	83.7%	191	82.0%	260	86.7%	205	84.4%	242	80.9%	227	79.1%
no	25	10.8%	23	12.4%	20	12.3%	32	11.1%	26	10.1%	32	13.7%	26	8.7%	31	12.8%	41	13.7%	45	15.7%
don't know	25	10.8%	14	7.6%	12	7.4%	19	6.6%	16	6.2%	10	4.3%	14	4.6%	7	2.9%	16	5.4%	15	5.2%
Did you call the electric company to report the outage?																				
yes	47	20.3%	28	15.1%	31	19.0%	50	17.3%	51	19.8%	47	20.2%	67	22.3%	53	21.8%	67	22.4%	69	24.0%
no	178	76.7%	156	84.3%	128	78.5%	237	82.0%	204	79.1%	185	79.4%	229	76.3%	186	76.5%	227	75.9%	217	75.6%
don't know	7	3.0%	1	0.5%	4	2.5%	2	0.7%	3	1.2%	1	0.4%	4	1.3%	4	1.6%	5	1.7%	1	0.3%
Were you satisfied or dissatisfied with how your call was handled?																				
satisfied	34	72.3%	18	64.3%	23	74.2%	35	70.0%	38	74.5%	36	76.6%	55	82.1%	36	67.9%	51	76.1%	50	72.5%
dissatisfied	9	19.1%	5	17.9%	7	22.6%	13	26.0%	11	21.6%	6	12.8%	11	16.4%	14	26.4%	13	19.4%	18	26.1%
neither	1	2.1%	5	17.9%	1	3.2%	1	2.0%	2	3.9%	5	10.6%	1	1.5%	3	5.7%	2	3.0%	1	1.4%
don't remember	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.5%	0	0.0%

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Table C-21: Subsidiary Rate Increase

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Would you be willing to pay more for your electricity so that people on Maui, Moloka'i, and Lana'i pay the same rate?																				
yes	63	20.3%	47	15.7%	48	16.0%	38	12.7%	44	14.7%	41	13.6%	69	22.7%	53	17.7%	46	15.3%	61	20.3%
no	212	68.4%	212	70.7%	207	69.0%	231	77.0%	176	58.7%	220	73.1%	205	67.4%	220	73.3%	218	72.7%	189	62.8%
depends on how much	13	4.2%	22	7.3%	14	4.7%	18	6.0%	53	17.7%	26	8.6%	11	3.6%	6	2.0%	14	4.7%	16	5.3%
don't know/not sure	20	6.5%	16	5.3%	29	9.7%	13	4.3%	26	8.7%	12	4.0%	19	6.3%	19	6.3%	21	7.0%	33	11.0%
refused	2	0.6%	3	1.0%	2	0.7%	0	0.0%	1	0.3%	2	0.7%	0	0.0%	2	0.7%	1	0.3%	2	0.7%
Would you be willing to pay about 2% ($3.90) more a month*?																				
yes	76	79.2%	66	77.6%	69	75.8%	50	72.5%	67	54.5%	59	74.7%	84	84.8%	63	80.8%	53	65.4%	80	72.7%
no	13	13.5%	11	12.9%	15	16.5%	6	8.7%	11	8.9%	6	7.6%	6	6.1%	8	10.3%	8	9.9%	20	18.2%
don't know/not sure	6	6.3%	7	8.2%	7	7.7%	13	18.8%	44	35.8%	14	17.7%	9	9.1%	7	9.0%	20	24.7%	10	9.1%
refused	1	1.0%	1	1.2%	0	0.0%	0	0.0%	1	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Would you be willing to pay about 5% ($9.75) more a month*?																				
yes	39	47.6%	21	28.8%	31	40.8%	18	28.6%	28	25.2%	27	37.0%	35	37.6%	31	44.3%	28	38.4%	31	34.4%
no	33	40.2%	41	56.2%	35	46.1%	29	46.0%	57	51.4%	26	35.6%	47	50.5%	28	40.0%	26	35.6%	48	53.3%
don't know/not sure	10	12.2%	10	13.7%	10	13.2%	15	23.8%	26	23.4%	20	27.4%	11	11.8%	11	15.7%	19	26.0%	10	11.1%
refused	0	0.0%	1	1.4%	0	0.0%	1	1.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
Would you be willing to pay about 7% ($13.65) more a month*?																				
yes	24	49.0%	14	45.2%	15	36.6%	4	12.1%	9	16.7%	8	17.0%	n/a	n/a	n/a	n/a	n/a	n/a	15	36.6%
no	17	34.7%	8	25.8%	16	39.0%	17	51.5%	25	46.3%	17	36.2%	n/a	n/a	n/a	n/a	n/a	n/a	18	43.9%
don't know/not sure	8	16.3%	9	29.0%	10	24.4%	11	33.3%	19	35.2%	22	46.8%	n/a	n/a	n/a	n/a	n/a	n/a	8	19.5%
refused	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	1.9%	0	0.0%	n/a	n/a	n/a	n/a	n/a	n/a	0	0.0%
Would you be willing to pay about 10% ($19.50) more a month*?																				
yes	16	50.0%	6	26.1%	8	32.0%	3	20.0%	6	21.4%	6	20.0%	n/a	n/a	n/a	n/a	n/a	n/a	9	39.1%
no	9	28.1%	10	43.5%	7	28.0%	5	33.3%	9	32.1%	3	10.0%	n/a	n/a	n/a	n/a	n/a	n/a	7	30.4%
don't know/not sure	7	21.9%	7	30.4%	10	40.0%	7	46.7%	13	46.4%	21	70.0%	n/a	n/a	n/a	n/a	n/a	n/a	7	30.4%

*Prior to 2001 calling, monetary amounts were $1.50 (2%), $4.00 (5%), $5.50 (7%) amd $8.00 (10%).
Prior to 2003 calling, monetary amounts were $2.20 (2%), $5.50 (5%), $7.70 (7%) amd $11.00 (10%).
Prior to 2004 calling, monetary amounts were $2.30 (2%), $5.80 (5%), $8.10 (7%) amd $11.60 (10%).
Prior to 2005 calling, monetary amounts were $2.60 (2%) and $6.40 (5%); the 7% and 10% questions were dropped from the survey.

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Table C-22: Bill Receipt and Payment

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Do you receive electric bill?																				
yes	307	99.0%	295	98.3%	296	98.7%	286	95.3%	292	97.3%	297	98.7%	297	97.7%	295	98.3%	292	97.3%	295	98.0%
no	3	1.0%	5	1.7%	4	1.3%	14	4.7%	8	2.7%	4	1.3%	7	2.3%	5	1.7%	8	2.7%	6	2.0%
Who in your household pays the electric bill?																				
respondent	234	75.5%	211	71.5%	218	73.6%	240	83.9%	205	70.2%	226	76.1%	209	70.4%	210	71.2%	208	71.2%	199	67.5%
someone else	57	18.4%	65	22.0%	47	15.9%	38	13.3%	54	18.5%	44	14.8%	74	24.9%	59	20.0%	69	23.6%	83	28.1%
automatic bill payer	9	2.9%	6	2.0%	22	7.4%	6	2.1%	4	1.4%	7	2.4%	5	1.7%	14	4.7%	5	1.7%	9	3.1%
varies	10	3.2%	13	4.4%	9	3.0%	2	0.7%	29	9.9%	20	6.7%	9	3.0%	10	3.4%	9	3.1%	4	1.4%
don't know	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.7%	1	0.3%	0	0.0%

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Table C-23: Environmentally Friendly Alternate Energy Sources

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Would you be willing to pay more for environmentally friendly energy sources?																				
I would be willing to pay more	113	36.5%	119	39.7%	137	45.7%	140	46.7%	121	40.3%	100	33.2%	144	47.4%	142	47.3%	128	42.7%	144	47.8%
I am not willing to pay more	163	52.6%	153	51.0%	147	49.0%	141	47.0%	124	41.3%	161	53.5%	138	45.4%	144	48.0%	155	51.7%	131	43.5%
don't know/no opinion/other	34	11.0%	28	9.3%	16	5.3%	19	6.3%	55	18.3%	40	13.3%	22	7.2%	14	4.7%	17	5.7%	26	8.6%
How much would you be willing to pay?																				
$1.00 or less	15	13.3%	3	2.5%	18	13.1%	10	7.1%	6	5.0%	4	4.0%	2	1.4%	1	0.7%	2	1.6%	8	5.6%
$2.00	8	7.1%	6	5.0%	11	8.0%	12	8.6%	14	11.6%	20	20.0%	7	4.9%	9	6.3%	4	3.1%	8	5.6%
$3.00	1	0.9%	3	2.5%	5	3.6%	2	1.4%	5	4.1%	3	3.0%	4	2.8%	6	4.2%	1	0.8%	3	2.1%
$4.00	9	8.0%	4	3.4%	2	1.5%	1	0.7%	1	0.8%	0	0.0%	1	0.7%	2	1.4%	1	0.8%	2	1.4%
$5.00	20	17.7%	29	24.4%	31	22.6%	31	22.1%	25	20.7%	28	28.0%	28	19.4%	29	20.4%	24	18.8%	24	16.7%
$6.00	0	0.0%	0	0.0%	1	0.7%	2	1.4%	0	0.0%	0	0.0%	2	1.4%	1	0.7%	0	0.0%	0	0.0%
$7.00	0	0.0%	2	1.7%	0	0.0%	3	2.1%	1	0.8%	1	1.0%	0	0.0%	1	0.7%	3	2.3%	3	2.1%
$8.00	0	0.0%	5	4.2%	1	0.7%	0	0.0%	3	2.5%	0	0.0%	1	0.7%	1	0.7%	0	0.0%	2	1.4%
$9.00	1	0.9%	0	0.0%	0	0.0%	0	0.0%	1	0.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
greater than or equal to $10.00	35	31.0%	41	34.5%	54	39.4%	44	31.4%	47	38.8%	31	31.0%	68	47.2%	63	44.4%	66	51.6%	70	48.6%
don't know/refused	24	21.2%	26	21.8%	14	10.2%	35	25.0%	18	14.9%	13	13.0%	31	21.5%	29	20.4%	27	21.1%	24	16.7%
Mean	$12.28		$10.10		$12.16		$9.86		$12.00		$6.92		$12.72		$14.01		$16.51		$13.80	
Median	$5.00		$7.00		$5.00		$5.00		$7.00		$5.00		$10.00		$10.00		$10.00		$10.00	
Maximum	$175.00		$100.00		$200.00		$153.00		$200.00		$67.00		$100.00		$100.00		$100.00		$100.00	

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Table C-24: Would Choose Another Electric Company

	1999 Annual		2000 Annual		2001 Annual		2002 Annual		2003 Annual		2004 Annual		2005 Annual		2006 Annual		2007 Annual		2nd Qtr 2007		3rd Qtr 2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Definitely would NOT	35	7.8%	38	8.4%	73	16.2%	75	16.7%	91	20.2%	57	12.6%	52	11.6%	54	11.9%	55	12.2%	25	16.6%	30	10.0%
Probably would NOT	125	27.8%	115	25.5%	121	26.9%	139	30.9%	118	26.2%	140	30.8%	139	30.9%	130	28.8%	133	29.4%	50	33.1%	83	27.6%
Probably WOULD	167	37.1%	183	40.7%	111	24.7%	124	27.6%	109	24.2%	119	26.2%	123	27.3%	127	28.1%	123	27.2%	39	25.8%	84	27.9%
Definitely WOULD	15	3.3%	12	2.7%	16	3.5%	11	2.4%	18	4.0%	21	4.6%	24	5.3%	32	7.1%	12	2.7%	4	2.6%	8	2.6%
Don't know	108	24.0%	102	22.7%	129	28.7%	101	22.4%	115	25.4%	117	25.8%	112	24.9%	109	24.1%	129	28.5%	33	21.9%	96	31.9%

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Table C-25: Cause of California Energy Situation

	2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Have you seen or heard anything recently about California energy issues or events?														
yes	264	88.0%	279	62.0%	210	46.6%	211	46.5%	217	48.2%	212	46.9%	150	33.2%
no/don't know	36	12.0%	171	38.0%	241	53.4%	243	53.5%	233	51.8%	240	53.1%	302	66.8%
What is the main cause of the current energy situation in California?														
demand exceeding supply	15	5.7%	27	9.7%	12	5.7%	17	8.1%	26	12.0%	43	20.3%	18	12.0%
population growth	28	10.6%	33	11.8%	24	11.4%	27	12.8%	26	12.0%	24	11.3%	14	9.3%
poor mgmt/planning	43	16.3%	28	10.0%	75	35.7%	26	12.3%	25	11.5%	11	5.2%	13	8.7%
corporate greed	42	15.9%	63	22.6%	31	14.8%	31	14.7%	34	15.7%	20	9.4%	11	7.3%
not enough power plants	22	8.3%	11	3.9%	0	0.0%	8	3.8%	5	2.3%	8	3.8%	10	6.7%
shortage of energy	8	3.0%	8	2.9%	8	3.8%	6	2.8%	6	2.8%	4	1.9%	8	5.3%
politics	31	11.7%	23	8.2%	20	9.5%	20	9.5%	12	5.5%	6	2.8%	6	4.0%
deregulation	29	11.0%	28	10.0%	8	3.8%	9	4.3%	6	2.8%	3	1.4%	4	2.7%
lack of conservation	5	1.9%	3	1.1%	1	0.5%	6	2.8%	6	2.8%	1	0.5%	4	2.7%
environmental restrictions	4	1.5%	1	0.4%	1	0.5%	1	0.5%	2	0.9%	4	1.9%	3	2.0%
buying power from other states	1	0.4%	4	1.4%	4	1.9%	0	0.0%	7	3.2%	3	1.4%	3	2.0%
Others	4	1.5%	17	6.1%	3	1.4%	31	14.7%	36	16.6%	58	27.4%	38	25.3%
Don't Know	32	12.1%	33	11.8%	23	11.0%	29	13.7%	26	12.0%	27	12.7%	18	12.0%

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Table C-26: Cause of Possible Hawai'i Energy Situation

	2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Could what is happening in California happen in Hawai'i?														
yes	173	65.5%	189	67.7%	154	73.3%	153	72.5%	158	72.8%	167	78.8%	119	79.3%
no/don't know	91	34.5%	90	32.3%	56	26.7%	58	27.5%	59	27.2%	45	21.2%	31	20.7%
What would be the main cause of a Hawai'i energy situation similar to California's?														
demand exceeding supply	14	8.1%	20	10.6%	18	11.7%	10	6.5%	17	10.8%	33	19.8%	25	21.0%
population growth	36	20.8%	31	16.4%	27	17.5%	21	13.7%	21	13.3%	18	10.8%	10	8.4%
poor mgmt/planning	32	18.5%	32	16.9%	45	29.2%	22	14.4%	16	10.1%	16	9.6%	10	8.4%
corporate greed	21	12.1%	30	15.9%	16	10.4%	15	9.8%	20	12.7%	15	9.0%	6	5.0%
shortage of energy	9	5.2%	10	5.3%	9	5.8%	9	5.9%	8	5.1%	5	3.0%	6	5.0%
not enough power plants	10	5.8%	11	5.8%	0	0.0%	7	4.6%	3	1.9%	5	3.0%	5	4.2%
environmental restrictions	3	1.7%	3	1.6%	0	0.0%	1	0.7%	3	1.9%	4	2.4%	4	3.4%
politics	11	6.4%	10	5.3%	17	11.0%	13	8.5%	10	6.3%	4	2.4%	4	3.4%
deregulation	10	5.8%	8	4.2%	3	1.9%	3	2.0%	2	1.3%	1	0.6%	2	1.7%
lack of conservation	1	0.6%	3	1.6%	3	1.9%	3	2.0%	6	3.8%	3	1.8%	1	0.8%
buying power from other states	3	1.7%	0	0.0%	0	0.0%	1	0.7%	5	3.2%	2	1.2%	0	0.0%
Others	4	2.3%	14	7.4%	1	0.6%	36	23.5%	40	25.3%	48	28.7%	34	28.6%
Don't Know	19	11.0%	17	9.0%	15	9.7%	37	24.2%	7	4.4%	13	7.8%	12	10.1%

Table C-27: Recent News Concerning MECO

	2000 Annual		2001 Annual		2002 Annual		2003 Annual		2004 Annual		2005 Annual		2006 Annual		2007 Annual		2nd Qtr 2007		3rd Qtr 2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Have there been any recent stories in the news concerning Maui Electric that comes to mind?																				
Yes	105	23.3%	67	14.9%	55	12.2%	80	17.7%	34	7.5%	36	8.0%	105	23.2%	60	13.3%	25	16.6%	35	11.6%
No/Don't know	345	76.7%	383	85.1%	395	87.8%	371	82.3%	420	92.5%	414	92.0%	347	76.8%	392	86.7%	126	83.4%	266	88.4%
What have you heard or read?																				
Renewable Ad Messages	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20	4.4%	12	7.9%	8	2.7%
Pilot For Windfarms	0	0.0%	3	0.7%	0	0.0%	0	0.0%	0	0.0%	6	1.3%	35	7.7%	10	2.2%	4	2.6%	6	2.0%
Rate Increase	7	1.6%	9	2.0%	5	1.1%	51	11.3%	7	1.5%	7	1.6%	4	0.9%	7	1.5%	5	3.3%	2	0.7%
Interest in biofuels at new plant	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	1.3%	0	0.0%	6	2.0%
Power Plant Expansion/Addition	82	18.2%	39	8.7%	18	4.0%	33	7.3%	9	2.0%	1	0.2%	2	0.4%	5	1.1%	2	1.3%	3	1.0%
Power Outages	3	0.7%	6	1.3%	7	1.6%	11	2.4%	7	1.5%	1	0.2%	6	1.3%	3	0.7%	1	0.7%	2	0.7%
Energy Eff. Program/Savings/Solar/wind power	9	2.0%	3	0.7%	2	0.4%	9	2.0%	4	0.9%	2	0.4%	56	12.4%	1	0.2%	0	0.0%	1	0.3%
Power Lines	7	1.6%	3	0.7%	17	3.8%	12	2.7%	2	0.4%	2	0.4%	3	0.7%	0	0.0%	0	0.0%	0	0.0%
Others	8	1.8%	10	2.2%	10	2.2%	3	0.7%	8	1.8%	20	4.4%	9	2.0%	15	3.3%	6	4.0%	9	3.0%
Don't Know	3	0.7%	3	0.7%	3	0.7%	4	0.9%	4	0.9%	1	0.2%	2	0.4%	5	1.1%	2	1.3%	3	1.0%

Table C-28: Type of Residence

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Own or rent home																				
own	205	66.1%	206	68.7%	217	72.3%	232	77.3%	200	66.7%	209	69.4%	227	74.7%	363	80.7%	363	80.3%	357	79.0%
rent	100	32.3%	89	29.7%	78	26.0%	63	21.0%	92	30.7%	89	29.6%	68	22.4%	76	16.9%	74	16.4%	69	15.3%
occupy without payment	4	1.3%	4	1.3%	1	0.3%	1	0.3%	6	2.0%	2	0.7%	9	3.0%	7	1.6%	12	2.7%	16	3.5%
don't know	1	0.3%	1	0.3%	4	1.3%	4	1.3%	2	0.7%	1	0.3%	0	0.0%	4	0.9%	3	0.7%	10	2.2%
Type of home																				
house	253	81.6%	250	83.3%	236	78.7%	249	83.0%	231	77.0%	226	75.1%	259	85.2%	388	86.2%	384	85.0%	381	84.3%
condo	20	6.5%	26	8.7%	34	11.3%	33	11.0%	32	10.7%	27	9.0%	29	9.5%	38	8.4%	41	9.1%	36	8.0%
townhouse	4	1.3%	6	2.0%	3	1.0%	5	1.7%	17	5.7%	24	8.0%	7	2.3%	6	1.3%	6	1.3%	11	2.4%
apartment	29	9.4%	14	4.7%	22	7.3%	7	2.3%	15	5.0%	20	6.6%	7	2.3%	13	2.9%	12	2.7%	10	2.2%
other	3	1.0%	3	1.0%	3	1.0%	3	1.0%	4	1.3%	3	1.0%	2	0.7%	3	0.7%	7	1.5%	7	1.5%
don't know/refused	1	0.3%	1	0.3%	2	0.7%	3	1.0%	1	0.3%	1	0.3%	0	0.0%	2	0.4%	2	0.4%	7	1.5%

*** Beginning in 2005, quarterly and year-end demographic numbers are consolidated.**

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Table C-29: Demographic Characteristics

	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Ethnicity																				
Caucasian	126	41.3%	148	49.3%	154	51.3%	172	57.3%	178	59.3%	164	54.5%	172	56.6%	234	52.0%	254	56.2%	245	54.2%
Hawaiian	59	19.0%	57	19.0%	45	15.0%	39	13.0%	34	11.3%	50	16.6%	39	12.8%	62	13.8%	57	12.6%	61	13.5%
Japanese	52	16.8%	37	12.3%	51	17.0%	38	12.7%	36	12.0%	45	15.0%	38	12.5%	58	12.9%	66	14.6%	54	11.9%
Filipino	18	5.8%	23	7.7%	20	6.7%	16	5.3%	16	5.3%	19	6.3%	24	7.9%	44	9.8%	36	8.0%	31	6.9%
mixed, not Hawaiian	13	4.2%	17	5.7%	9	3.0%	12	4.0%	19	6.3%	17	5.6%	12	3.9%	23	5.1%	9	2.0%	26	5.8%
Chinese	4	1.3%	1	0.3%	3	1.0%	6	2.0%	7	2.3%	1	0.3%	4	1.3%	3	0.7%	3	0.7%	4	0.9%
Black	1	0.3%	1	0.3%	0	0.0%	1	0.3%	1	0.3%	0	0.0%	2	0.7%	2	0.4%	1	0.2%	1	0.2%
other	30	9.7%	5	1.7%	14	4.7%	8	1.0%	5	1.7%	4	1.3%	6	2.0%	15	3.3%	9	2.0%	16	3.5%
don't know	5	1.6%	11	3.7%	4	1.3%	8	1.0%	4	1.3%	1	0.3%	7	2.3%	9	2.0%	17	3.8%	14	3.1%
Years in Hawai'i																				
less than 1 year	5	1.6%	2	0.7%	4	1.3%	7	2.3%	1	0.3%	2	0.7%	1	0.3%	1	0.2%	1	0.2%	3	0.7%
1 to 5 years	29	9.4%	33	11.0%	41	13.7%	35	11.7%	34	11.3%	30	10.0%	29	9.5%	44	9.8%	27	6.0%	33	7.3%
6 to 20 years	82	26.5%	92	30.7%	70	23.3%	78	26.0%	95	31.7%	82	27.2%	78	25.7%	110	24.4%	124	27.4%	110	24.3%
over 20, not lifetime	60	19.4%	73	24.3%	54	18.0%	77	25.7%	74	24.7%	67	22.3%	76	25.0%	119	26.4%	140	31.0%	124	27.4%
lifetime	132	42.6%	95	31.7%	130	43.3%	100	33.3%	95	31.7%	119	39.5%	118	38.8%	175	38.9%	159	35.2%	174	38.5%
don't know	2	0.6%	5	1.7%	1	0.3%	3	1.0%	1	0.3%	1	0.3%	2	0.7%	1	0.2%	1	0.2%	8	1.8%
Years at current address																				
less than 1 year	37	11.9%	33	11.0%	26	8.7%	21	7.0%	16	5.3%	11	3.7%	17	5.6%	21	4.7%	20	4.4%	19	4.2%
1 to 5 years	104	33.5%	115	38.3%	111	37.0%	94	31.3%	113	37.7%	101	33.6%	96	31.6%	142	31.6%	109	24.1%	105	23.2%
6 to 20 years	107	34.5%	84	28.0%	99	33.0%	99	33.0%	115	38.3%	115	38.2%	109	35.9%	166	36.9%	200	44.2%	186	41.2%
over 20, not lifetime	48	15.5%	55	18.3%	55	18.3%	75	25.0%	41	13.7%	65	21.6%	68	22.4%	103	22.9%	108	23.9%	121	26.8%
lifetime	12	3.9%	7	2.3%	8	2.7%	8	2.7%	12	4.0%	8	2.7%	14	4.6%	16	3.6%	12	2.7%	13	2.9%
don't know	2	0.6%	6	2.0%	1	0.3%	3	1.0%	3	1.0%	1	0.3%	0	0.0%	2	0.4%	3	0.7%	8	1.8%
Age																				
18 to 24	17	5.5%	14	4.7%	12	4.0%	5	1.7%	11	3.7%	15	5.0%	5	1.6%	15	3.3%	10	2.2%	13	2.9%
25 to 34	44	14.2%	46	15.3%	41	13.7%	26	8.7%	32	10.7%	33	11.0%	36	11.8%	37	8.2%	27	6.0%	30	6.6%
35 to 44	72	23.2%	87	29.0%	66	22.0%	61	20.3%	63	21.0%	57	18.9%	59	19.4%	87	19.3%	66	14.6%	71	15.7%
45 to 54	81	26.1%	75	25.0%	77	25.7%	80	26.7%	103	34.3%	68	22.6%	75	24.7%	120	26.7%	127	28.1%	113	25.0%
55 or older	84	27.1%	73	24.3%	103	34.3%	119	39.7%	89	29.7%	124	41.2%	126	41.4%	182	40.4%	216	47.8%	216	47.8%
refused	12	3.9%	5	1.7%	1	0.3%	9	3.0%	2	0.7%	4	1.3%	3	1.0%	9	2.0%	6	1.3%	9	2.0%
Income																				
less than $20,000	13	4.2%	17	5.7%	23	7.7%	16	5.3%	8	2.7%	19	6.3%	19	6.3%	29	6.4%	24	5.3%	26	5.8%
$20,000 to $30,000	35	11.3%	42	14.0%	27	9.0%	14	4.7%	14	4.7%	26	8.6%	16	5.3%	38	8.4%	27	6.0%	33	7.3%
$30,000 to $40,000	42	13.5%	33	11.0%	36	12.0%	38	12.7%	36	12.0%	29	9.6%	34	11.2%	43	9.6%	35	7.7%	34	7.5%
$40,000 to $50,000	22	7.1%	32	10.7%	45	15.0%	34	11.3%	35	11.7%	33	11.0%	36	11.8%	40	8.9%	39	8.6%	37	8.2%
$50,000 to $75,000	38	12.3%	60	20.0%	79	26.3%	53	17.7%	46	15.3%	53	17.6%	73	24.0%	98	21.8%	90	19.9%	78	17.3%
$75,000 to $100,000	43	13.9%	32	10.7%	48	16.0%	46	15.3%	55	18.3%	43	14.3%	79	26.0%	123	27.3%	157	34.8%	67	14.8%
More than $100,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	82	18.1%
don't know, refused	117	37.7%	84	28.0%	42	14.0%	99	33.0%	106	35.3%	98	32.6%	47	15.5%	79	17.6%	80	17.7%	95	21.0%
Gender																				
male	126	40.6%	124	41.3%	118	39.3%	122	40.7%	118	39.3%	112	37.2%	115	37.8%	167	37.1%	168	37.2%	181	40.0%
female	184	59.4%	176	58.7%	182	60.7%	178	59.3%	182	60.7%	189	62.8%	189	62.2%	283	62.9%	284	62.8%	271	60.0%

* Beginning in 2005, quarterly and year-end demographic numbers are consolidated.

APPENDIX D: SURVEY INSTRUMENT - QUARTERLY

MECO RESIDENTIAL CUSTOMER QUARTERLY SURVEY
Ward Research, Inc. (WR 4501)—Quarter 2
May 2007

PLEASE NOTE THAT SOME OF THE CATI NUMBERS HAD TO BE CHANGED TO MATCH WITH LONG VERSION...

Q.1 **[10]** Hello, I'm _____ with Ward Research, a professional market research firm here in Honolulu. We're conducting a survey about services provided to Maui residents. Are you one of the heads of the household?

IF NO, ASK: May I speak to the head of the household? [REPEAT INTRODUCTION IF NECESSARY]

IF NONE AVAILABLE, ASK TO SPEAK TO THE SPOUSE OF THE HEAD OR ANYONE 18 OR OLDER. REPEAT INTRODUCTION IF NECESSARY.

- ❑ 1 *Head of household*
- ❑ 2 Spouse of head of household
- ❑ 3 Adult over age 18
- ❑ 4 Head/spouse unavailable (TERMINATE & SCHEDULE CALLBACK)
- ❑ 5 No adult available (TERMINATE & CODE AS CALL BACK)

Q.2 **[15]** Do you or anyone in your household work for a marketing company, a market research company, an advertising agency, a utility company, or a company that owns a utility company?

(IF YES) Thank you very much but we have reached our quota for these categories.

[TERMINATE AND CODE AS 'DID NOT PASS SCREENER']

- ❑ 1 yes
- ❑ 2 no

Q.3 **[20]** Are you a resident of MAUI County?

(IF NO) Thank you, but we are only interviewing Maui residents.

[TERMINATE AND CODE AS 'DID NOT PASS SCREENER']

- ❑ 1 yes
- ❑ 2 no

Q.4 **[25]** RECORD GENDER OF RESPONDENT.

ASK FOR CLARIFICATION ONLY IF ABSOLUTELY NECESSARY.

- ❑ 1 male
- ❑ 2 female

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Q.5 **[135]** Utility companies provide service in a variety of ways -- including, billing , providing power or telephone service, repair service, and many other aspects of customer service.

❑1 ENTER [.] TO CONTINUE

[ASK QUESTIONS 6 TO 7 IN RANDOM ORDER]

Q.6 **[140]** On a scale from 1 to 5, where 1 means very dissatisfied, and 5 means very satisfied - -

How satisfied are you with the service you receive from HAWAIIAN TELCOM ?

[REPEAT SCALE IF NECESSARY]

❑1 1 (VERY DISSATISFIED)
❑2 2
❑3 3
❑4 4
❑5 5 (VERY SATISFIED)
❑6 *don't know/refused*

Q.7 **[145]** On a scale from 1 to 5, where 1 means very dissatisfied, and 5 means very satisfied - -

How satisfied are you with the service you receive from MAUI ELECTRIC COMPANY ?

[REPEAT SCALE IF NECESSARY]

❑1 1 (VERY DISSATISFIED)
❑2 2
❑3 3
❑4 4
❑5 5 (VERY SATISFIED)
❑6 don't know/refused

[ASK QUESTIONS 8 TO 23 IN RANDOM ORDER IN GROUPS OF 2]
[ASK QUESTIONS 8 TO 9 IN RANDOM ORDER]

Q.8 **[149]** Now, I would like you to rate two companies on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

[160] How would you rate MAUI ELECTRIC COMPANY on RELIABLE SERVICE?

❑1 1 (VERY POOR)
❑2 2
❑3 3
❑4 4
❑5 5 (EXCELLENT)
❑6 don't know/refused

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Q.9 **[161]** How would you rate Hawaiian Telcom on RELIABLE SERVICE?

IF NECESSARY READ: *on a scale of 1 to 5, with 1 meaning very poor and 5 meaning* excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

[ASK QUESTIONS 10 TO 11 IN RANDOM ORDER]

Q.10 **[170]** How would you rate MAUI ELECTRIC COMPANY on LOW COST?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refusal

Q.11 **[171]** How would you rate Hawaiian Telcom on LOW COST?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

[ASK QUESTIONS 12 TO 13 IN RANDOM ORDER]

Q.12 **[180]** How would you rate MAUI ELECTRIC COMPANY on FAST RESPONSE TO TROUBLE CALLS?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

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Q.13 **[181]** How would you rate Hawaiian Telcom on FAST RESPONSE TO TROUBLE CALLS?

IF NECESSARY READ: *on a scale of 1 to 5, with 1 meaning very poor and 5 meaning* excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

[ASK QUESTIONS 14 TO 15 IN RANDOM ORDER]

Q.14 **[190]** How would you rate MAUI ELECTRIC COMPANY on UNINTERRUPTED SERVICE?

IF NECESSARY READ: *on a scale of 1 to 5, with 1 meaning very poor and 5 meaning* excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

Q.15 **[191]** How would you rate Hawaiian Telcom on UNINTERRUPTED SERVICE?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

[ASK QUESTIONS 16 TO 17 IN RANDOM ORDER]

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Q.16 **[200]** How would you rate MAUI ELECTRIC COMPANY on FRIENDLY EMPLOYEES?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

Q.17 **[201]** How would you rate Hawaiian Telcom on FRIENDLY EMPLOYEES?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

[ASK QUESTIONS 18 TO 19 IN RANDOM ORDER]

Q.18 **[210]** How would you rate MAUI ELECTRIC COMPANY on FAST RECOVERY AFTER STORMS?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

Q.19 **[211]** How would you rate Hawaiian Telcom on FAST RECOVERY AFTER STORMS?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5
- ❑ 6 don't know/refused

[ASK QUESTIONS 20 TO 21 IN RANDOM ORDER]

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Q.20 **[220]** How would you rate MAUI ELECTRIC COMPANY on **accurate billing**?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

Q.21 **[221]** How would you rate Hawaiian Telcom on **accurate billing**?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

[ASK QUESTIONS 22 TO 23 IN RANDOM ORDER]

Q.22 **[230]** How would you rate MAUI ELECTRIC COMPANY on **good things** they do to benefit your island's residents -- like sponsoring events or helping charities and community groups?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

Q.23 **[231]** How would you rate Hawaiian Telcom on **good things** they do to benefit your island's residents -- like sponsoring events or helping charities and community groups?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑ 1 1 (VERY POOR)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (EXCELLENT)
- ❑ 6 don't know/refused

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[ASK QUESTIONS 24 TO 25 IN RANDOM ORDER]

Q.24 **[250]** *Now, how would you rate MAUI ELECTRIC COMPANY's* ***overall performance****?*

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑1 1 (VERY POOR)
- ❑2 2
- ❑3 3
- ❑4 4
- ❑5 5 (EXCELLENT)
- ❑6 don't know/refused

Q.25 **[251]** Now, how would you rate Hawaiian Telcom's **overall performance**?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑1 1 (VERY POOR)
- ❑2 2
- ❑3 3
- ❑4 4
- ❑5 5 (EXCELLENT)
- ❑6 don't know/refused

[ASK QUESTIONS 26 TO 27 IN RANDOM ORDER]

Q.26 **[260]** Now, thinking about everything you are able to do as a result of having electricity, how would you rate the **"value for the money"** of electric service?

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑1 1 (VERY POOR)
- ❑2 2
- ❑3 3
- ❑4 4
- ❑5 5 (EXCELLENT)
- ❑6 don't know/refused

Q.27 **[261]** Think about the value of having telephone service. How would you rate the " **value for the money"** *of telephone service?*

IF NECESSARY READ: on a scale of 1 to 5, with 1 meaning very poor and 5 meaning excellent.

- ❑1 1 (VERY POOR)
- ❑2 2
- ❑3 3
- ❑4 4
- ❑5 5 (EXCELLENT)
- ❑6 don't know/refused

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Q.28 **[395]** Do you agree or disagree that MAUI ELECTRIC COMPANY is doing its best to protect the environment in all of its operations?

- ❑ 1 agree
- ❑ 2 disagree
- ❑ 3 don't know

Q.29 **[530]** Have there been any recent stories in the news concerning MAUI ELECTRIC COMPANY that comes to mind?

- ❑ 1 yes
- ❑ 2 no/don't know

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION 32]

Q.30 **[535]** What have you heard or read?

DO NOT READ LIST
RECORD UP TO 3 ANSWERS
ROLLING BLACKOUTS/CONSERVATION/PEAK DEMAND IS DIFFERENT THAN JUST "POWER OUTAGE"
STUDENTS /SOLAR SYSTEM/NEW AD IS DIFFERENT THAN JUST "SOLAR"
(note: code 8 and 9 added Feb 2005)

- ❑ 1 powerplant expansion/additions
- ❑ 2 rates/increase in cost
- ❑ 3 energy efficient programs/savings
- ❑ 4 powerlines
- ❑ 5 power outages
- ❑ 6 Other (SPECIFY)
- ❑ 7 don't know
- ❑ 8 Solar/wind power
- ❑ 9 Rolling blackouts/conservation/peak demand
- ❑ 10 STUDENTS /SOLAR SYSTEM/NEW AD
- ❑ 11 Pilot for Wind Farm
- ❑ 12 Credit on the monthly bill for the Kapolei area residents
- ❑ 13 Bill insert/Coupon and information about CFL (compact fluorescent light)
- ❑ 14 *Change in leadership/new CEO*

[A - IF THE ANSWER TO QUESTION 30 IS NOT 6, THEN SKIP TO QUESTION 32]

Q.31 **[537]** Other (SPECIFY)

_____

_____

Q.32 **[540]** Are you aware of any recent cost savings or information programs offered by Maui Electric Company?

- ❑ 1 yes
- ❑ 2 no
- ❑ 3 don't know

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION 37]

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Q.33 **[545]** Which ones do you remember?

DO NOT READ LIST ---
PROBE -- ANY OTHERS

RECORD UP TO 5 ANSWERS

- ❑ 1 coupon program for $20 off air conditioning
- ❑ 2 Emergency Prepared Handbook
- ❑ 3 solar rebate program
- ❑ 4 coupon compact fluorescent light bulb
- ❑ 5 showerhead
- ❑ 6 sun power for schools
- ❑ 7 Other (SPECIFY)
- ❑ 8 don't know
- ❑ 9 Energy Scout
- ❑ 10 Conservation Campaign.
- ❑ 12 Low income assistance program

[A - IF THE ANSWER TO QUESTION 33 IS NOT 7, THEN SKIP TO QUESTION 35]

Q.34 **[547]** Other (SPECIFY)

_____

_____

Q.35 **[550]** And, where did you hear or see this offer?

RECORD UP TO 3 ANSWERS

- ❑ 1 television
- ❑ 2 radio
- ❑ 3 newspaper
- ❑ 4 magazine
- ❑ 5 bill insert
- ❑ 6 direct mail (i.e. flyers, brochures)
- ❑ 7 word-of-mouth
- ❑ 8 Other (SPECIFY)
- ❑ 9 don't know

[A - IF THE ANSWER TO QUESTION 35 IS NOT 8, THEN SKIP TO QUESTION 37]

Q.36 **[552]** Other (SPECIFY)

_____

_____

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Q.41 **[320]** Has the power in your neighborhood gone off in the last six months?

- ❑ 1 Yes
- ❑ 2 No
- ❑ 3 DON'T KNOW (DO NOT READ)

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION 47]

Q.42 **[325]** Was that just for a few minutes, or was it for a much longer period?

- ❑ 1 Just a few minutes
- ❑ 2 Longer period
- ❑ 3 DON'T KNOW (DO NOT READ)

Q.43 **[330]** Were you satisfied with the Electric Company's handling of the problem?

- ❑ 1 Yes
- ❑ 2 No
- ❑ 3 DON'T KNOW (DO NOT READ)

Q.44 **[335]** Did you call the Electric Company to report the outage?

- ❑ 1 Yes
- ❑ 2 No
- ❑ 3 DON'T KNOW (DO NOT READ)

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION 47]

Q.45 **[340]** Were you satisfied or dissatisfied with how your call was handled?

- ❑ 1 Satisfied
- ❑ 2 Dissatisfied
- ❑ 3 NEITHER (DO NOT READ)
- ❑ 4 DON'T REMEMBER (DO NOT READ)

[A - IF THE ANSWER TO QUESTION 45 IS NOT 2, THEN SKIP TO QUESTION 47]

Q.46 **[345]** Why were you dissatisfied?

PAUSE FOR RESPONSE
PROBE - Any other reasons?

_____

_____

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Q.47 **[575]** Currently, Maui Electric is the only provider of electricity on Maui. Suppose there were more than one electric company and you could choose another electric company to serve you. What would you do? Would you say you (READ LIST).....

- ❑ 1 definitely would NOT choose another electric company
- ❑ 2 probably would NOT choose another electric company
- ❑ 3 probably WOULD choose another electric company
- ❑ 4 definitely WOULD choose another electric company
- ❑ 5 (DO NOT READ) don't know

Q.48 **[580]** Have you seen or heard anything in the past about issues or events in California or on the East Coast related to energy, like the price or availability of electricity?

- ❑ 1 yes
- ❑ 2 no
- ❑ 3 don't know

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION 52]

Q.49 **[585]** Thinking about the energy-related events you have seen or heard about, what do you think is the main cause of the energy situation in California or on the East Coast?

INTERVIEWER: DO NOT READ LIST AND RECORD ONE ANSWER ONLY

- ❑ 01 poor management/planning
- ❑ 02 deregulation
- ❑ 03 population growth
- ❑ 04 not enough power plants
- ❑ 05 demand exceeding supply
- ❑ 06 corporate greed
- ❑ 07 politics
- ❑ 08 lack of conservation
- ❑ 09 shortage of energy
- ❑ 10 environmental restrictions
- ❑ 11 buying power from other states
- ❑ 12 other causes
- ❑ 13 don't know

Q.50 **[590]** Do you think what happened in California or on the East Coast could happen in Hawaii?

- ❑ 1 yes
- ❑ 2 no
- ❑ 3 don't know

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION 52]

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Q.51 **[595]** If it happens, what would be the main cause of any energy situation in Hawaii similar to the situations that happened in California and on the East Coast?

INTERVIEWER: DO NOT READ LIST AND RECORD ONE ANSWER ONLY

- ❑ 01 poor management/planning
- ❑ 02 *deregulation*
- ❑ 03 population growth
- ❑ 04 not enough power plants
- ❑ 05 demand exceeding supply
- ❑ 06 corporate greed
- ❑ 07 politics
- ❑ 08 lack of conservation
- ❑ 09 shortage of energy
- ❑ 10 environmental restrictions
- ❑ 11 buying power from other states
- ❑ 12 other causes
- ❑ 13 don't know

Q.52 **[600]** Now, I just have a few more questions for statistical purposes. Do you own or rent your home?

- ❑ 1 own
- ❑ 2 rent
- ❑ 3 occupy without payment
- ❑ 4 don't know/refused

Q.53 **[605]** *Is that a house, apartment, condominium, or a townhouse?*

- ❑ 1 house
- ❑ 2 apartment
- ❑ 3 *condominium*
- ❑ 4 townhouse
- ❑ 5 other
- ❑ 6 don't know/refused

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Q.54 **[610]** What is your ethnic background?

READ LIST

IF MIXED, ASK: Would that include Hawaiian ?

PORTUGUESE, SPANISH, GERMAN, IRISH, ETC = CAUCASIAN
HISPANIC, AMERICAN INDIAN = OTHER

RECORD ONE MENTION ONLY

- ❑ 1 Caucasian
- ❑ 2 Chinese
- ❑ 3 Filipino
- ❑ 4 Hawaiian or part-Hawaiian
- ❑ 5 Japanese
- ❑ 6 mixed, not Hawaiian
- ❑ 7 Black of African-American
- ❑ 8 Other (SPECIFY)
- ❑ 9 *don't know/refused*

[A - IF THE ANSWER TO QUESTION 54 IS NOT 8, THEN SKIP TO QUESTION 315]

Q.55 **[612]** Other (SPECIFY)

_____

_____

Q.56 **[615]** How many years have you lived in Hawaii?

- ❑ 1 less than 1 year
- ❑ 2 1 to 5 years
- ❑ 3 6 to 20 years
- ❑ 4 over 20, not lifetime
- ❑ 5 lifetime
- ❑ 6 don't know/refused

Q.57 **[620]** How many years have you lived at your current address?

- ❑ 1 less than 1 year
- ❑ 2 1 to 5 years
- ❑ 3 *6 to 20 years*
- ❑ 4 over 20, not lifetime
- ❑ 5 lifetime
- ❑ 6 *don't know/refused*

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Q.58 **[625]** What is your age? is it.... (READ LIST)

- ❑ 1 18 to 24
- ❑ 2 25 to 34
- ❑ 3 35 to 44
- ❑ 4 45 to 54
- ❑ 5 55 or older
- ❑ 6 (DO NOT READ) don't know/refused

Q.59 **[630]** *What was the total 2006 income before taxes, for all members of your household?* Was it... (READ LIST)

- ❑ 1 less than $20,000
- ❑ 2 $20,000 - but under $30,000
- ❑ 3 $30,000 - but under $40,000
- ❑ 4 $40,000 - but under $50,000
- ❑ 5 $50,000 - but under $75,000
- ❑ 6 $75,000 - but under $100,000
- ❑ 7 (DO NOT READ) don't know/refused
- ❑ 8 $100,000 or more

Q.60 **[635]** Finally, please think now about your experience with this survey. How would you rate this survey experience overall, from start to finish? Please a 5 point scale, with 5 = excellent and 1 = poor, and please feel free to rate it honestly.

- ❑ 1 1 (poor)
- ❑ 2 2
- ❑ 3 3
- ❑ 4 4
- ❑ 5 5 (excellent)
- ❑ 9 9 (don't know/no opinion)

[A - IF THE ANSWER TO QUESTION 60 IS 3-9, THEN SKIP TO QUESTION 345]

Q.61 **[640]** Why do you give that rating?

PROBE: What else can you tell me about that?

_____

_____

Q.62 **[645]** Do you know or are you acquainted with anyone working the electric company?

- ❑ 1 yes
- ❑ 2 no
- ❑ 3 (DNR) don't know/not sure

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Q.63 **[650]** Thank you very much. That is all the questions I have for you today. May I please have your first name or initials in case my supervisor needs to verify that I completed this survey with you?

[IF RESPONDENT DOES NOT WANT TO PROVIDE FIRST NAME ENTER "NONE"]

_____

INFORMATION FROM SAMPLE FILE:

[725] CUSTNBR

[726] ACCTNUM

[727] NAME

[728] SVC_ADD

[729] SVC_CITY

[730] ST

[731] SVC_ZIP

[732] ISLAND

[733] PHONE1

[734] BILLAMT

[735] KWH

[737] NUM_TYPE

[738] WARDID

~~**[739] RAND**~~

~~**[740] PHONE2**~~

~~**[741] "NP, D, MP"**~~

~~**[742] PHONE 1?**~~

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APPENDIX E: SURVEY INSTRUMENT – 3RD QUARTER/YEAR-END

MECO RESIDENTIAL CUSTOMER QUARTERLY SURVEY
Ward Research, Inc. (WR 4580)—Quarter 3—Year-End
July 2007

Q.1**[10]** Hello, I'm _____ with Ward Research, a professional market research firm here in Honolulu. We're conducting a survey about services provided to Maui residents. Are you one of the heads of the household?

IF NO, ASK: MAY I SPEAK TO THE HEAD OF THE HOUSEHOLD?
IF NONE AVAILABLE ASK TO SPEAK TO THE
SPOUSE OF THE HEAD OR ANYONE 18 OR OLDER.

1 head of household
2 spouse of head of household
3 adult over 18
4 head/spouse unavailable (SCHEDULE CALLBACK)
5 no adult available (THANK AND TERMINATE)

A.**[15]** Do you or anyone in your household work for a marketing company, a market research company, an advertising agency, a utility company, or a company that owns a utility company?

1 yes (THANK AND TERMINATE)
2 no

B.**[20]** Are you a resident of MAUI COUNTY?

1 yes
2 no (THANK AND TERMINATE)

C.**[25]** RECORD GENDER OF RESPONDENT.
IF NECESSARY -- ONLY ASK FOR CLARIFICATION

1 male
2 female

Q1.**[30a-c]** When you think of large companies that provide basic services to Hawaii's residents, which ones come to mind? Any others?

DO NOT READ LIST
ENTER CODES IN ORDER MENTIONED BY RESPONDENT, RECORD UP TO 4 RESPONSES

1 Hawaiian Telcom
2 Gasco/The Gas Company
4 Maui Electric Company
5 OTHER (SPECIFY)
6 NONE/DON'T KNOW/REFUSED

Q1A.**[32a-b]** Other Specify (Q1)

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Q2.**[35a-c]** For which companies that provide basic services do you remember seeing or hearing advertising in the past month? Any others?

DO NOT READ LIST
ENTER CODES IN ORDER MENTIONED BY RESPONDENT, RECORD UP TO 4 RESPONESES

OTHER SPECIFY

1 Hawaiian Telcom
2 Gasco/The Gas Company
4 Maui Electric Company
5 OTHER (SPECIFY)
6 NONE/DON'T KNOW/REFUSED

Q2A.**[37a-b]** Other Specify (Q2)

[S- IF NOT MENTIONED IN Q1 OR Q2 – ASK Q3, Q4 & Q6]

Q3.**[40]** Have you heard of Hawaiian Telcom?

1 yes
2 no/don't know

Q4.**[45]** Have you heard of Gasco or The Gas Company?

1 yes
2 no/don't know

Q5. Have you heard of The Gas Company? **DELETED 7/2001**

1 yes
2 no/don't know

Q6.**[55]** Have you heard of Maui Electric Company?

1 yes
2 no/don't know

[S- IF Q2 IS 1 OR Q3 IS 2 THEN – SKIP TO Q8]

Q7.**[60]** In the past month, do you remember seeing or hearing advertising for Hawaiian Telcom?

1 yes
2 no/don't know

[S- IF Q2 IS 2 OR Q4 IS 2 THEN – SKIP TO Q10]

Q8.**[65]** In the past month, do you remember seeing or hearing advertising for Gasco or The Gas Company?

1 yes
2 no/don't know

Q9. In the past month, do you remember seeing or hearing advertising for The Gas Company? **DELETED 7/2001**

1 yes
2 no/don't know
[S- IF Q2 IS 4 OR Q6 IS 2 THEN – SKIP TO Q11]

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Q10.**[75]** In the past month, do you remember seeing or hearing advertising for Maui Electric Company?

1 yes
2 no/don't know

[S- IF Q2 OR Q7 IS NOT 1 THEN SKIP TO Q12]

Q11.**[80a-b]** You said you remember some advertising for Hawaiian Telcom. What do you remember seeing or hearing?

PROBE --- RECORD UP TO 3 RESPONSES

1 just remember it was on TV
2 lower rates, special rates
3 Yellow pages
4 long distance calls
5 services offered
6 international calling
7 interisland calls
8 newspaper ad
9 Phone Mart
10 Beyond the Call
11 nothing
12 OTHER (SPECIFY)
13 DON'T REMEMBER

Q11A.**[82a-b]** Other specify (Q11)

[S- IF Q2 IS NOT 4 OR Q10 IS NOT 1 THEN SKIP TO Q13]

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Q.12.**[85a-b]** *You said you remember some advertising for Maui Electric company. What do you remember seeing or hearing?*

PROBE --- RECORD UP TO 3 RESPONSES
ROLLING BLACKOUTS/CONSERVATION/PEAK DEMAND IS DIFFERENT THAN JUST "POWER OUTAGE"
STUDENTS /SOLAR SYSTEM/NEW AD IS DIFFERENT THAN JUST "SOLAR"

1 Employees, on the job
2 conservation of energy
3 service calls
4 dealing with power outages
5 rates
6 environment, testing the water
7 HEI or an HEI company
8 other resources, solar, wind, etc.
9 Storm Tracks
10 American Savings
11 nothing
12 OTHER (SPECIFY)
13 DON'T REMEMBER
14 Rolling blackouts/conservation/peak demand (code14 & 15 added Oct 2004).
15 Students /Solar system/new ad
16 Coupon and information about CFL (compact fluorescent light)
20 New renewable tv commercials and ads with Jade Moon
(Code 16 added as per BW/MF, Oct, 10, 2005; 20-added as per MF 10/2/06)
21 CFLs -- coupons, print info
22 CFLs - television/radio ad
23 Anything about Jade Moon
24 Any mention of Hiroshima music

Q12A.**[87a-b]** Other Specify (Q12)

Q13.**[90]** Some people feel that large companies are a valuable part of the community - because they provide jobs and provide essential services to our residents. Other people feel that these companies are mostly out for their own profits, and can't be trusted to look out for the interest of our residents. Which of those is closest to your opinion?

READ CHOICES

1 *large companies are valuable, or*
2 they can not be trusted?
3 DON'T KNOW

[ASK QUESTIONS 14a TO 14f IN RANDOM ORDER]

Q14A.**[95]** In particular, do you consider Hawaiian Telcom to be a trusted partner to the community, or do you feel they cannot be trusted?

1 Trusted
2 Not Trusted
3 Don't know

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Q14B.[100] In particular, do you consider MAUI ELECTRIC COMPANY to be a trusted partner to the community, or do you feel they cannot be trusted?

1 Trusted
2 Not Trusted
3 Don't know

Q14C. [105] In particular, do you consider OCEANIC CABLEVISION to be a trusted partner to the community, or do you feel they cannot be trusted?

1 Trusted
2 Not Trusted
3 Don't know

Q14D. [110] In particular, do you consider FIRST HAWAIIAN BANK to be a trusted partner to the community, or do you feel they cannot be trusted?

1 Trusted
2 Not Trusted
3 Don't know

Q14F. [115] In particular, do you consider THE HONOLULU ADVERTISER to be a trusted partner to the community, or do you feel they cannot be trusted?

1 Trusted
2 Not Trusted
3 Don't know

[135]Utility companies provide service in a variety of ways -- including, billing, providing power or *telephone service, repair service, and many other aspects of customer service.*

1 text screen

[ASK QUESTIONS 15a TO 15b IN RANDOM ORDER]

15A.[140] On a scale from 1 to 5, where 1 means very dissatisfied, and 5 means very satisfied; How satisfied are you with the service you receive from ....

HAWAIIAN TELCOM (REPEAT SCALE IF NECESSARY)

1 1 (VERY DISSATISFIED)
2 2
3 3
4 4
5 5 (VERY SATISFIED)
6 don't know/refused

15B.[145] On a scale from 1 to 5, where 1 means very dissatisfied, and 5 means very satisfied; How satisfied are you with the service you receive from ....

MAUI ELECTRIC COMPANY (REPEAT SCALE IF NECESSARY)

1 1 (VERY DISSATISFIED)
2 2
3 3
4 4
5 5 (VERY SATISFIED)
6 don't know/refused

[ASK QUESTIONS 16a TO 16h1 IN RANDOM ORDER IN GROUPS OF 2]

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[ASK QUESTIONS 16a TO 16a1 IN RANDOM ORDER]

[149] Now, I would like you to rate two companies on a scale from 1 to 5, with 1 meaning very poor and 5 meaning excellent.

Q16a.**[160]** How would you rate MAUI ELECTRIC Company on RELIABLE SERVICE?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16a1.**[161]** How would you rate Hawaiian Telcom on RELIABLE SERVICE?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16b TO 16b1 IN RANDOM ORDER]

Q16b.**[170]** How would you rate MAUI ELECTRIC Company on LOW COST?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16b1.**[171]** How would you rate Hawaiian Telcom on LOW COST?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16c TO 16c1 IN RANDOM ORDER]

Q16c.**[180]** How would you rate MAUI ELECTRIC Company on FAST RESPONSE TO TROUBLE CALLS?

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IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 *don't know/refused*

Q16c1.**[181]** How would you rate Hawaiian Telcom on FAST RESPONSE TO TROUBLE CALLS?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16d TO 16d1 IN RANDOM ORDER]

Q16d.**[190]** How would you rate MAUI ELECTRIC Company on UNINTERRUPTED SERVICE?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16d1.**[191]** How would you rate Hawaiian Telcom on UNINTERRUPTED SERVICE?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16e TO 16e1 IN RANDOM ORDER]

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Q16e.**[200]** How would you rate MAUI ELECTRIC Company on FRIENDLY EMPLOYEES?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16e1.**[201]** How would you rate Hawaiian Telcom on FRIENDLY EMPLOYEES?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16f TO 16f1 IN RANDOM ORDER]

Q16f.**[210]** How would you rate MAUI ELECTRIC Company on FAST RECOVERY AFTER STORMS?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16f1.**[211]** How would you rate Hawaiian Telcom on FAST RECOVERY AFTER STORMS?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16g TO 16g1 IN RANDOM ORDER]

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Q16g.**[220]** How would you rate MAUI ELECTRIC Company on ACCURATE BILLING?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16g1.**[221]** How would you rate Hawaiian Telcom on ACCURATE BILLING?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

[ASK QUESTIONS 16h TO 16h1 IN RANDOM ORDER]

Q16h.**[230]** How would you rate MAUI ELECTRIC Company on GOOD THINGS they do to benefit your island's residents -- like sponsoring events or helping charities and community groups?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

Q16h1.**[231]** How would you rate Hawaiian Telcom on GOOD THINGS they do to benefit your island's residents – like sponsoring events or helping charities and community groups?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 don't know/refused

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[ASK QUESTIONS 17a TO 17b IN RANDOM ORDER]

Q17a.**[250]** Now, how would you rate the MAUI ELECTRIC'S OVERALL PERFORMANCE?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 6 don't know/refused

Q17b.**[251]** Now, how would you rate Hawaiian Telcom's OVERALL PERFORMANCE?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 6 don't know/refused

[ASK QUESTIONS 18a TO 18b IN RANDOM ORDER]

Q18a.**[260]** Now, thinking about everything you are able to do as a result of having electricity, how would you rate the "value for the money" of electric service?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 6 don't know/refused

Q18b.**[261]** Think about the value of having telephone service. How would you rate the "value for the money" of telephone service?

IF NECESSARY READ: ON A SCALE OF 1 TO 5, WITH 1 MEANING VERY POOR AND 5 MEANING EXCELLENT

1 1 (VERY POOR)
2 2
3 3
4 4
5 5 (EXCELLENT)
6 6 don't know/refused

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Q19.**[300]** In your opinion, other than providing electric power, what is the ONE thing that the electric company does that is the greatest benefit to the community?

PROBE --- RECORD ONE MENTION ONLY

1 provide jobs
2 build/help economy
3 community projects/services/events
4 education of kids/safety/McGruff
5 education of public/bill insert/newsletter
6 provide information on conservation/energy
7 employees donating their time
8 alternative energy sources
9 cooking/recipes
10 clean up after storms and floods
11 american safety
12 just provide power and electric
13 no opinion
14 nothing
15 OTHER (SPECIFY)
16 DON'T KNOW/NO IDEA

Q19a. **[302]** Other Specify (Q19)

Q20. **[305]** On a scale of 1 to 7, with 1 meaning "very unfair" and 7 meaning "very fair," how fair do you think electric rates are?

1 1 (VERY UNFAIR)
2 2
3 3
4 4
5 5
6 6
7 7 (VERY FAIR)
8 DON'T KNOW

Q21. **[310]** On a scale of 1 to 7, with 1 meaning "not concerned at all about customers," and 7 meaning "very concerned about customers," how concerned do you think your electric company is?

1 1 (NOT CONCERNED)
2 2
3 3
4 4
5 5
6 6
7 7 (VERY CONCERNED)
8 DON'T KNOW

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Q22. **[315]** On a scale of 1 to 7, with 1 meaning "very poor" and 7 meaning "very good," how well do you think your electric company works with its customers to help keep the electric bills down?

1 1 (VERY POOR)
2 2
3 3
4 4
5 5
6 6
7 7 (VERY GOOD)
8 8 DON'T KNOW

Q23.**[320]** Has the power in your neighborhood gone off in the last six months?

1 yes
2 no
3 DON'T KNOW (DO NOT READ)

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q29]

Q24.**[325]** Was that just for a few minutes, or was it for a much longer period?

1 just a few minutes
2 longer period
3 DON'T KNOW (DO NOT READ)

Q25.**[330]** Were you satisfied with the Electric Company's handling of the problem?

1 yes
2 no
3 DON'T KNOW (DO NOT READ)

Q26.**[335]** Did you call the electric company to report the outage?

1 yes
2 no
3 DON'T KNOW (DO NOT READ)

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q29]

Q27.**[340]** Were you satisfied or dissatisfied with how your call was handled?

1 satisfied
2 dissatisfied
3 NEITHER (DO NOT READ)
4 DON'T REMEMBER (DO NOT READ)

[S - IF THE ANSWER IS NOT 2, THEN SKIP TO QUESTION Q29]

Q28.**[345a-b]** Why were you dissatisfied?

PAUSE FOR RESPONSE
PROBE -- Any other reasons?

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Q29.**[350]** Does your household receive an electric bill?

1 yes
2 no
3 DON'T KNOW

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q32]

Q30.**[355]** Who in your household pays the electric bill?

1 respondent
2 someone else
3 automatic bill payment
4 it varies
5 DON'T KNOW

Q31. Did you know that people can have their electric bill paid automatically from their checking accounts?
DELETED 7/2001

1 yes
2 no
3 DON'T KNOW

Q32.**[365]** Have you seen the NEWSLETTER --- "CONSUMER LINES", that is enclosed with your monthly electric bill?

1 yes
2 no
3 DON'T KNOW

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q35a]

Q33.**[370]** Do you usually read all of it, some of it, a little of it, or not read it at all?

1 all
2 some of it
3 a little of it
4 not at all
5 DON'T KNOW

[S - IF THE ANSWER IS NOT 1 or 2 or 3, THEN SKIP TO QUESTION Q35a]

Q34.**[375a]** What do you remember reading about in CONSUMER LINES?

PROBE --- DO NOT READ LIST
RECORD UP TO 2 RESPONSES

1 save energy/ways to conserve
2 recipes
3 rate increases/explanations
4 Hurricane and storm tips
5 safety practices/safe energy use
6 other (SPECIFY)
7 nothing specific
8 don't remember
9 Solar power program
10 Information about CFL (compact fluorescent light)
11 Wind Mill/Wind Power Added 5/07

Q34a.**[377a-b]** Other Specify (Q34)

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[ASK QUESTIONS 35a TO 35h IN RANDOM ORDER]

Q35a.**[380]** Do you agree or disagree that the electric company is basically honest when they give the reasons for needing to increase rates?

1 agree
2 disagree
3 DON'T KNOW

Q35b.**[385]** Do you agree or disagree that the electric company is committed to providing quality service?

1 agree
2 disagree
3 DON'T KNOW

Q35c.**[390]** Do you agree or disagree that the electric company is telling the truth when they explain the reasons for power outages?

1 agree
2 disagree
3 DON'T KNOW

Q35d.**[395]** Do you agree or disagree that the electric company is doing its best to protect the environment in all of its operations?

1 agree
2 disagree
3 DON'T KNOW

Q35e.**[400]** Do you agree or disagree that the electric company helps its customers to conserve energy?

1 agree
2 disagree
3 DON'T KNOW

Q35f.**[405]** Do you agree or disagree that the only time you hear anything about the electric company is when they want to raise rates?

1 agree
2 disagree
3 DON'T KNOW

Q35g.**[410]** Do you agree or disagree that the electric company doesn't really give anything back to the community?

1 agree
2 disagree
3 DON'T KNOW

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Q35h.**[415]** Do you agree or disagree that the electric company is doing its best to encourage using *energy sources that don't use oil*?

1 agree
2 disagree
3 DON'T KNOW

Q36.**[420]** People on Maui, Molokai, and Lanai pay different electric rates because it costs more on Molokai and Lanai to provide electrical service than it does on Maui. Would you be willing to pay more for your electricity so that people on all three islands would be paying the same rate?

1 yes
2 not sure/don't know
3 depends on how much
4 no
5 REFUSED

[S - IF THE ANSWER IS 4 or 5, THEN SKIP TO QUESTION Q37]

Q36a.**[425]** Would you be willing to pay more if the increase was about **(Change 7/07 per MF)** 2 percent, which is $3.90 a month for an average customer?

1 yes
2 not sure/don't know
3 no
4 REFUSED

[S - IF THE ANSWER IS 3 or 4, THEN SKIP TO QUESTION Q37]

Q36b.**[430]** Would you be willing to pay more if the increase was about **(Change 7/07/per MF)** 5 percent, which is $9.75 a month for an average customer?

1 yes
2 not sure/don't know
3 no
4 REFUSED

Q36c. and Q36d. added back per Milton Fujioka's July 18, 2007 email

Q36c. **[431]** Would you be willing to pay more if the increase was about 7 percent, which is $13.65 a *month for an average customer?* **(was DELETED 7/04)**

1 yes
2 not sure/don't know
3 no
4 REFUSED

Q36d. **[432]** Would you be willing to pay more if the increase was about 10 percent, which is $19.50 a *month for an average customer?* **(was DELETED 7/04)**

1 yes
2 not sure/don't know
3 no
4 REFUSED

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Q37.**[520]** Electric and magnetic fields surround every wire that carries electric power from household appliances to overhead lines. Have you heard or read anything recently about the possible health or environmental effects of electrical and magnetic fields?

1 yes
2 no
3 DON'T KNOW

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q39]

Q38.**[525]** In general, how much of a threat to your personal health and safety do you consider electric and magnetic fields? Do you consider them: (READ CHOICES)

1 a very serious threat
2 somewhat serious threat
3 not too serious a threat
4 not a threat at all
5 DON'T KNOW

Q39.**[530]** Have there been any recent stories in the news concerning Maui Electric that comes to mind?

1 yes
2 no/DON'T KNOW

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q40]

Q39a.**[535a-b]** What have you heard or read?

DO NOT READ LIST, RECORD UP TO 3 ANSWERS
ROLLING BLACKOUTS/CONSERVATION/PEAK DEMAND IS DIFFEREN THAN JUST "POWER OUTAGE" STUDENTS /SOLAR SYSTEM/NEW AD IS DIFFERENT THAN JUST "SOLAR"

- ❑ 1 powerplant expansion/additions
- ❑ 2 rates/increase in cost
- ❑ 3 energy efficient programs/savings
- ❑ 4 powerlines
- ❑ 5 power outages
- ❑ 6 Other (SPECIFY)
- ❑ 7 don't know
- ❑ 8 Solar/wind power
- ❑ 9 Rolling blackouts/conservation/peak demand
- ❑ 10 STUDENTS /SOLAR SYSTEM/NEW AD
- ❑ 11 Pilot for Wind Farm
- ❑ 12 Credit on the monthly bill for the Kapolei area residents
- ❑ 13 Bill insert/Coupon and information about CFL (compactfluorescent light)
- ❑ 14 Change in leadership/new CEO
- ❑ 15 New renewable tv commercials and ads with Jade Moon
(Code 15-added as per BW/MF Oct 2, 06)
- ❑ 16 Interest in biofuels at new plant

Q39a1.**[537a-b]** Other Specify (Q39a)

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Q40.**[540a-b]** Are you aware of any recent cost savings or information programs offered by Maui Electric Company?

1 yes
2 no
3 DON'T KNOW

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q41]

Q40a.**[545a-d]** Which ones do you remember?

DO NOT READ LIST
PROBE --- Any others? RECORD UP TO 5 RESPONSES

- ❑ 1 coupon program for $20 off air conditioning
- ❑ 2 Emergency Prepared Handbook
- ❑ 3 solar rebate program
- ❑ 4 coupon compact fluorescent light bulb
- ❑ 5 showerhead
- ❑ 6 sun power for schools
- ❑ 7 Other (SPECIFY)
- ❑ 8 don't know
- ❑ 9 Energy Scout
- ❑ 10 Conservation Campaign.
- ❑ 12 Low income assistance program
- ❑ 13 Wind Mill/Wind Power **Added 5/07**

Q40a1.**[547a-b]** Other Specify (Q40a)

Q40b.**[550a-b]** And, where did you hear or see this offer?

RECORD UP TO 3 ANSWERS

1 Television
2 Radio
3 Newspaper
4 Magazine
5 Bill insert
6 Direct Mail (flyers/brochures)
7 Word-of-mouth
8 OTHER (SPECIFY)
9 DON'T KNOW

Q40b1.**[552a-b]** Other Specify (Q40b)

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Q41.[555] Some people say that they would be willing to pay more on their electric bill each month if the electric company would do more to develop and use alternate energy sources that are more environmentally friendly. Others say that they are not willing to pay more on their electric bill for such things.

Which would you say is closest to your opinion:

READ LIST

1 I would be willing to pay more... or
2 I am not willing to pay more for such things..."
3 DON'T KNOW/NO OPINION/OTHER

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q43]

Q42.[560] About how much more would you be willing to pay on your monthly electric bill?

PROMPT FOR AMOUNT -- ENTER AS WHOLE NUMBER
DO NOT ACCEPT RANGE
REFUSED = 9999

Q43.[575] Currently, Maui Electric is the only provider of electricity for Maui County. Suppose there were more than one electric company and you could choose another electric company to serve you. What would you do? Would you say you (READ LIST) ...

1 definitely would NOT choose another electric company
2 probably would NOT choose another electric company
3 probably WOULD choose another electric company
4 definitely WOULD choose another electric company
5 (DO NOT READ) Don't know

Q43a.[580] Have you seen or heard anything in the past about issues or events in California or on the East Coast related to energy, like the price or availability of electricity?

1 yes
2 no
9 don't know

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q44]

Q43b.[585] Thinking about the energy-related events you have seen or heard about, what do you think is the main cause of the energy situation in California or on the East Coast?

INTERVIEWER: DO NOT READ LIST AND RECORD ONE ANSWER ONLY

1 poor management/planning
2 deregulation
3 population growth
4 not enough power plants
5 demand exceeding supply
6 corporate greed
7 politics
8 lack of conservation
9 shortage of energy
10 environmental restrictions
11 buying power from other states
12 other cause
13 don't know

Q43c.[590] Do you think what happened in California or on the East Coast could happen in Hawaii?

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1 yes
2 no
3 don't know

[S - IF THE ANSWER IS NOT 1, THEN SKIP TO QUESTION Q44]

Q43d.**[595]** If it happens, what would be the main cause of any energy situation in Hawaii similar to the situations that happened in California and on the East Coast?

INTERVIEWER: DO NOT READ LIST AND RECORD ONE ANSWER ONLY

1 poor management/planning
2 deregulation
3 population growth
4 not enough power plants
5 demand exceeding supply
6 corporate greed
7 politics
8 lack of conservation
9 shortage of energy
10 environmental restrictions
11 buying power from other states
12 other cause
13 don't know

Q44.**[600]** Now I just have a few questions for statistical purposes. Do you own or rent your home?

1 own
2 rent
3 occupy without payment
4 DON'T KNOW OR REFUSED

Q45.**[605]** Is that a house, apartment, condominium, or a townhouse?

1 house
2 apartment
3 condominium
4 townhouse
5 other
6 DON'T KNOW OR REFUSED

Q46.**[607]** Including yourself, how many people live in your household?

ENTER NUMBER
DO NOT ACCEPT RANGE
REFUSED = 99

Q47.**[608]** What is your zip code?

VERIFY IF ZIP CODE IS DIFFERENT THAN
REFUSED = 99999

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Q48.**[610]** What is your ethnic background?

READ LIST

.

IF MIXED, ASK: Would that include Hawaiian ?

.

PORTUGUESE, SPANISH, GERMAN, IRISH, ETC = CAUCASIAN
HISPANIC, AMERICAN INDIAN = OTHER

1 Caucasian
2 Chinese
3 Filipino
4 Hawaiian/part Hawaiian
5 Japanese
6 mixed, not Hawaiian
7 Black or African-American
8 other (SPECIFY)
9 DON'T KNOW/REFUSED

Q48b.**[612]** Other Specify (Q51)

Q49.**[615]** How many years have you lived in Hawaii?

1 less than 1 year
2 1 to 5 years
3 6 to 20 years
4 over 20, not lifetime
5 lifetime
6 DON'T KNOW/REFUSED

Q50.**[620]** How many years have you lived at your current address?

1 less than 1 year
2 1 to 5 years
3 6 to 20 years
4 over 20, not lifetime
5 lifetime
6 DON'T KNOW/REFUSED

Q51.**[625]** What is your age? Is it (READ LIST) ...

1 18 to 24
2 25 to 34
3 35 to 44
4 45 to 54
5 55 or older?
6 DON'T KNOW/REFUSED

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Q52.**[630]** What was the total 2006 income before taxes, for all members of your household? Was it (READ LIST) ...

1 less than $20,000
2 $20,000 to $30,000
3 $30,000 to $40,000
4 $40,000 to $50,000
5 $50,000 to $75,000
6 $75,000 to $100,000
7 DON'T KNOW/REFUSED
8 $100,000 and over

Q53.**[635]** Finally, please think now about your experience with this survey. How would you rate this survey experience overall, from start to finish? Please use a 5 point scale, with 5 = excellent and 1 = poor, and please feel free to rate it honestly.

1 1 (poor)
2 2
3 3
4 4
5 5 (excellent)
9 9 (don't know/no opinion)

[S - IF THE ANSWER IS 1 or 2, THEN SKIP TO QUESTION Q53b]

Q53a.**[640a-c]** Why do you give that rating?

PROBE: What else can you tell me about that?

Q53b.**[645]** Do you know or are you acquainted with anyone working at the electric company?

1 yes
2 no
9 (DNR) don't know/not sure

[650] Thank you very much. These are all the questions I have for today. May I have your first name just in case my supervisor needs to verify that I completed this survey?

IF RESPONDENT DOES NOT WANT TO PROVIDE FIRST NAME
ENTER "NONE"

THIS IS A COMPLETED INTERVIEW.

[678] CUSTNBR

[679] ACCTNUM

[680] NAME

[681] SVC_ADD

[682] SVC_CITY

[683] ST

[684] SVC_ZIP

[685] ISLAND

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[675] PHONE1

[687] BILLAMT

[688] KWH

[690] NUM_TYPE

[676] WARDID

[686] Phone2

[691] Phone1?

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