



JSSI

JET SUPPORT SERVICES, INC.

MANAGING HELICOPTER MAINTENANCE RISK

RAYMOND WEISER | OCTOBER 23RD, 2015

AGENDA



- Introduction
- How Maintenance Effects Asset Values
- Scheduled vs. Unscheduled Maintenance
- What Can Go Wrong?
- How Maintenance Programs Can Protect Operators, Lessors, and Financiers

ABOUT JSSI



- Founded in 1989
- The largest independent provider of hourly cost maintenance programs for business aircraft engines, airframes and APUs
- Comprehensive, flexible and affordable financial tools for managing the often unpredictable costs of operating and maintaining nearly all types of turbine-powered aircraft, including jets, turboprops and helicopters
- Global headquarters in Chicago, USA
- European headquarters in Farnborough, UK
- 45% of JSSI clients are based internationally



JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

There are three distinct types of maintenance

- Scheduled Maintenance
- Unscheduled Maintenance
- Preventative Maintenance


JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

OEM Service Notifications

- Service Letters
- Service Bulletins
- Airworthiness Directives


JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

Special Inspections

- Severe Climates
 - Sandy Atmosphere
 - Salt Laden Environment
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JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

Storage and Preservation

- Weekly Requirements
 - Short Term
 - Long Term
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JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

Technical Documentation

- Log Books
 - Legibility
 - Accuracy
 - Airworthiness Complaint
 - Maintenance Tracking System
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JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

Replacement Parts

- OEM Approved
 - PMA – Parts Manufacturer Approval
 - Time Continued Serviceable
 - Acceptance of Local Airworthiness Approval
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JSSI HOW MAINTENANCE EFFECTS ASSET VALUES

Other Contributing Factors

- SMS – Safety Management Systems
 - OEM Product Specific Training
 - Proper Tooling
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JSSI SCHEDULED VS. UNSCHEDULED MAINTENANCE

Scheduled Maintenance

- Budget – Financially Predictable
 - Scheduling of Manpower and a Back Up Aircraft
 - Quicker Turn Around Time for Increased Aircraft Availability
 - Cost Effective Sourcing of Parts
 - Reduced Human Factors
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JSSI SCHEDULED MAINTENANCE

Example Inspection Schedule used for Rate Calculation: **Bell 407GX**

Inspection Forecast in 12-month Periods with a Start Date of 13-Apr-2015							
Forecasted Annual Utilization: 500 Hours 250 Cycles							
Event	Frequency	Year 1	Year 2	Year 3	Year 4	Year 5	Due Within 6 Months of Contract Expiration
300 Hour Inspection Optional Equipment	300 Hours	•	••	••	•	••	•
600 Hour Inspection	600 Hours		•	•	•	•	
Periodic Inspection	300 Hours / 12 Months	•	••	••	•	••	•
12 Month Inspection	12 Months	•	•	•	•	•	
24 Month Inspection	24 Months		•		•		
600 Hour / 12 Month Inspection	600 Hours / 12 Months	•	•	•	•	•	
1200 Hour / 24 Month Inspection	1200 Hours / 24 Months		•		•		
1200 Hour Inspection	1200 Hours			•		•	
2500 Hour Inspection	2500 Hours					•	

Other Major Component Overhaul or Scheduled Replacement							
with a cost of \$1,000 or more associated with it.							
Event	Frequency	Year 1	Year 2	Year 3	Year 4	Year 5	Due Within 6 Months of Contract Expiration
Weight & Balance	36 Months			•			
25 Hour Lubrication	25 Hours	••	••	••	••	••	••
Main Rotor Grip #1	5000 Hours						
Main Rotor Grip #2	5000 Hours						
Main Rotor Grip #3	5000 Hours						
Main Rotor Grip #4	5000 Hours						
Upper Plate	2500 Hours					•	
Lower Plate	2500 Hours					•	

JSSI SCHEDULED MAINTENANCE

Example Inspection Schedule used for Rate Calculation: **Bell 407GX (A250-C47B)**

[Sort]	[PartCategoryName]	[PartName]	[PartNo]	[LimitHrs]	[LimitCycles]	COST	Cost Per Hour	Cost Per Cycle
1	ENGINE	OVERHAUL	250-C20J	2000		\$ 280,500.00	\$ 140.25	
2	ENGINE	HOT SECTION INSPECTION						
3	COMPRESSOR	IMPELLER ASSEMBLY	23058147	3550	9150	\$ 55,693.00	\$ 15.69	\$ 6.09
4	COMPRESSOR	IMPELLER ASSEMBLY		3550	9150		\$ -	\$ -
4	TURBINE MODULE	1st STAGE WHEEL	M250-10223	1775	3000	\$ 10,243.73	\$ 5.77	\$ 3.41
4	TURBINE MODULE	1st STAGE WHEEL		1775	3000		\$ -	\$ -
5	TURBINE MODULE	2nd STAGE WHEEL	23073854	1775	3000	\$ 11,514.36	\$ 6.49	\$ 3.84
5	TURBINE MODULE	2nd STAGE WHEEL		2025	3000		\$ -	\$ -
6	TURBINE MODULE	3rd STAGE WHEEL	23065718	4550	6000	\$ 17,026.00	\$ 3.74	\$ 2.84
7	TURBINE MODULE	4th STAGE WHEEL	23055944	4550	6000	\$ 12,326.80	\$ 2.71	\$ 2.05
7	COMPRESSOR	4th STAGE WHEEL		4550	6000		\$ -	\$ -
8	1st STAGE NOZZLE	1st STAGE NOZZLE SHIELD	23073533	10000		\$ 3,587.96	\$ 0.36	
9	BLEED VALVE	BLEED VALVE	23053176	1500		\$ 7,451.02	\$ 4.97	
10	FUEL PUMP	FUEL PUMP	6899253	4000		\$ 18,808.75	\$ 4.70	
11	FUEL NOZZLE	FUEL NOZZLE	23077068	2500		\$ 9,907.71	\$ 3.96	
12	GOVERNOR	GOVERNOR	23065123	2000		\$ 23,631.00	\$ 11.82	
13	FUEL CONTROL	FUEL CONTROL	23070606	2500		\$ 45,154.00	\$ 18.06	

JSSI SCHEDULED MAINTENANCE

Example Utilization Schedule used for Rate Calculation: **Bell 407GX (A250-C47B)**

Cycles/Hour	Minutes	Hours	Warranty	First / Second Run
6.0	10	0.1667	\$ 277.79	\$ 292.75
5.5	11	0.1833	\$ 262.30	\$ 276.43
5.0	12	0.2000	\$ 246.82	\$ 260.11
4.6	13	0.2167	\$ 231.33	\$ 243.79
4.0	15	0.2500	\$ 215.84	\$ 227.46
3.5	17	0.2833	\$ 200.35	\$ 211.14
3.0	20	0.3333	\$ 184.86	\$ 194.82
2.5	24	0.4000	\$ 169.37	\$ 178.50
2.0	30	0.5000	\$ 153.88	\$ 162.17
1.7	35	0.5833	\$ 144.59	\$ 152.38
1.5	40	0.6667	\$ 138.40	\$ 145.85
1.2	50	0.8333	\$ 129.10	\$ 136.06
1.0	60	1.0000	\$ 122.91	\$ 129.53

JSSI WARRANTY IS NOT MAINTENANCE

\$125,446 In Scheduled Maintenance Not Covered by Warranty: **Bell 407GX**


Inspection Forecast in 12-month Periods with a Start Date of **13-Apr-2015**

Forecasted Annual Utilization: **500 Hours** **250 Cycles**

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300 Hour Inspection Optional Equipment	300 Hours	•	••	••	•	••	•
600 Hour Inspection	600 Hours		•	•	•	•	
Periodic Inspection	300 Hours / 12 Months	•	••	••	•	••	•
12 Month Inspection	12 Months	•	•	•	•	•	
24 Month Inspection	24 Months		•		•		
600 Hour / 12 Month Inspection	600 Hours / 12 Months	•	•	•	•	•	
1200 Hour / 24 Month Inspection	1200 Hours / 24 Months		•		•		
1200 Hour Inspection	1200 Hours			•		•	
2500 Hour Inspection	2500 Hours					•	

JSSI SCHEDULED VS. UNSCHEDULED MAINTENANCE

Unscheduled Maintenance

- AOG
 - Contractual Fines
 - Impact to the Financial Forecast
 - Man Power
 - Human Factors
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JSSI UNSCHEDULED MAINTENANCE

Example Unscheduled Factor used for Rate Calculation: **Bell 407GX**

Over and Above Factor Rates				
Aircraft Age Years	Squawk Factor	Unsch Only Sgk Factor	In Route Sgk Factor	In Route \$\$
0 to 2	0.5	1.1	1	\$ 7,293
3 to 4	0.8	1.8	2	\$ 10,848
5 to 6	1	2	3	\$ 19,250
7 to 8	1.5	2.5	4	\$ 19,250
9 to 10	1.5	2.5	4	\$ 19,250
11 to 12	2	3	5	\$ 25,750
13 to 14	2	3	5	\$ 25,750
15 to 16	2	3	5	\$ 25,750
17 to 18	2.5	3.5	6	\$ 25,750
19 to 20	2.5	3.5	6	\$ 25,750
21 to -	3	4	7	\$ 38,500

JSSI UNSCHEDULED MAINTENANCE

Top 10 Unscheduled Events – Last 12 months

→ Engine vibration issue - HP Compressor repair	\$2,741,489.72
→ In flight shut down	\$949,227.59
→ High Pressure Compressor malfunction in flight	\$883,724.30
→ Hot Section distress found during a pre-buy bore scope inspection	\$852,605.33
→ In flight shut down	\$802,959.50
→ RH Engine Low Pressure Spool - Gearbox failure	\$565,477.66
→ Engine stall in flight - Repair covered under warranty, rental covered by JSSI.	\$493,926.16
→ LH Engine Oil Leak suspect #4 Carbon Seal	\$479,672.59
→ High Oil Temp & Gearbox Pressures	\$467,518.01
→ Metal in the oil - Shop visit required for repair	\$453,674.83

JSSI WHAT CAN GO WRONG?

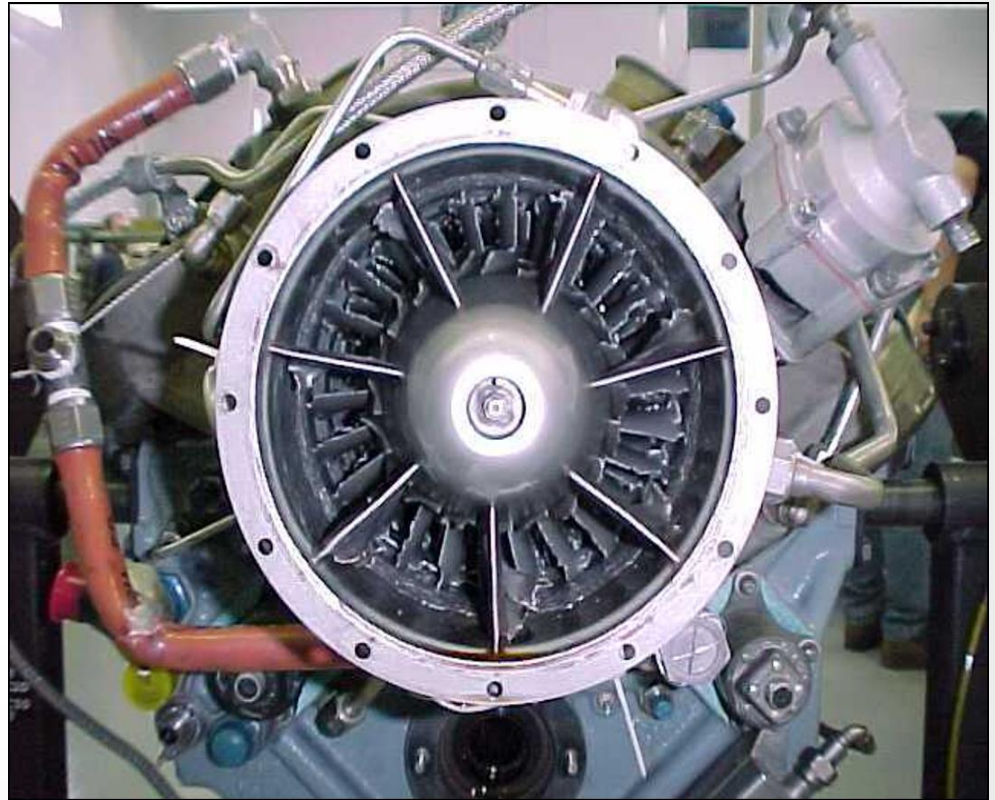
- AOG
 - Pre-Purchase Inspections
 - Product Specific Training
 - Barrier Engine Filters
 - Corrosion
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JSSI WHAT CAN GO WRONG?

The real damage isn't from FOD. Its from what your insurance won't cover.

JSSI Unscheduled Includes:

- Catastrophic Engine Failure
- Rental Engine Costs
- FOD Gap Coverage
- Unscheduled Repair for LRU
- Unscheduled Repair for LLC
- Engine R&R
- Engine Freight



JSSI MAINTENANCE PROGRAM PROTECTION

New Aircraft:

- Coverage For Warranty Loopholes & Maintenance
- Enhanced Residual Value
- 100% Coverage For Scheduled and Unscheduled Maintenance, Including FOD Gap
- Budget Stability, Take the Unpredictability of Maintenance Away for First Time Owners

In-Service Aircraft:

- Consumed Engine Life is Not Just Based on TSN Alone. LLC Considerations
 - Substantial Savings on Upcoming Maintenance Events due to JSSI Buying Power
 - Enhanced Residual Value
 - 100% Coverage for Unscheduled Maintenance from day one
 - No Buy-in Required
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THANK YOU.

QUESTIONS?