Operating leases
The impact on maintenance cost

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Athens, Greece
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SGI Aviation

SGI is uniquely positioned in the industry to support your operations as your needs develop

- SGI Aviation is one of the largest independent technical advisors to the aviation industry
- Handles all aspects of technical consulting services, asset management and aviation-focused regulatory advisory
- Services are performed by a team of 45 professionals from all areas of the aviation and aerospace industry
- IATA strategic partner, active participant of the Aircraft Leasing Advisory Group (ALAG)
SGI Aviation

An overview of some of our major programs in 2013-2014

**Technical Services**

- Performed more than 250 aircraft and engine inspections last year:
  - Over 40 midterms were performed on more than 60 aircraft worldwide
  - 18 pre-purchase inspection programs on more than 30 aircraft
  - More than 200 aircraft valuations
  - Over 150 engine inspections
  - And more than 40 aircraft (re)delivery programs

- Consulting services:
  - Performed an ACMI and operational feasibility study for a major Asian carrier
  - Assisted with the optimization of existing lease processes for a European airline
  - Managed several aircraft disposal programs for end-of-life aircraft
  - Assisted an airline in optimizing their existing operation

**Engine Services**

- Responsible for lease and asset management of B737-800, B747-400, ATR72, CRJ200, A320, A330 and A380

**Regulatory Services**

- Assisted a Middle Eastern carrier to resolve the EU ‘Blacklisting’ status
- Performed over 20 training sessions for several aviation authorities
- Helped a start-up simulator training organization implement SMS and obtain their regulatory approval
- Performed a number of regulatory compliance audits at a number of airlines
- Trained several airlines on the EASA Ops regulations
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Introduction

Approximately 50% of the world fleet will be under a lease in next decade

In the 1980’s less than 5% of aircraft were leased, this number will continue to grow to nearly 50% in the next decade¹

Pros
- No residual value risk
- Improved balance sheet, tax advantages, etc.
- Ability to operate new aircraft without large investments

Cons
- Additional requirements (e.g. records, maintenance limitations)
- Payment of maintenance reserves & security deposit
- Additional administrative burden, difficult redelivery event

Introduction

The basics of an operating lease

- The aircraft is delivered in “As-is-where-is” condition
- The lease is a ‘net lease’
- Protection mechanisms are introduced
  - Maintenance reserve or ‘additional rent’ payments are paid
  - Annual inspections by the lessor
  - Additional requirements as specified in the lease
- The aircraft is redelivered in accordance with the redelivery conditions
During the 2013 IATA MCC, it was estimated that:

- Direct maintenance cost for FY2012 was $13,98B
- Overhead was $3.17B

The lessor will introduce many mechanisms to ensure the asset protected

So the real questions are:

- What is the effect on the total maintenance cost as a result of the additional requirements from the lease?
- Can the airline fully benefit from any cost reductions or improvements?

Source: IATA Maintenance Cost Conference, Chairman’s report September 2013
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Airframe

The additional requirements during the operation

**COMPONENTS**
- Dual release certificate
- 110% rule

**AIRFRAME**
- Typically requires FAA & EASA release
- Repair requirements
- Modifications

**DOCUMENTATION**
- Additional standards over and above aviation regulations
- Back-to-birth requirements
- Consolidation & organization

**MAINTENANCE RESERVES**
- Payment of maintenance reserves
- Claim submittal & handling
Additional requirements

What is their effect?

**DOCUMENTATION**
- Additional standards
- Back to birth traceability
- Consolidation & organization

- Longer retention period
- Requirement for more detailed maintenance records
- Adjusted records process or rework at the end of the lease

**COMPONENTS**
- Dual release certificate
- 110% rule

- Issue and retention of FAA and EASA certificate (on top of local certification)
- Limitation of ‘pooling concept’
- Similar or better parts

**AIRFRAME**
- FAA and/or EASA certification
- Repair requirements
- Modifications

- FAA and/or EASA release (on top of local release)
- Limitation of temporary repairs
- FAA and/or EASA approved modifications
Engines
The additional requirements during the operation

LIFE LIMITED PARTS
- Traceability requirements
- Non-incident/accident statements

LRU’s
- Dual release certificate
- 110% rule

OVERHAUL
- Minimum build life requirement
- Qualifying event definition
- PMA/DER limitations
Additional requirements

**What is their effect?**

**LIFE LIMITED PARTS**
- Traceability requirements
- Non-incident/accident statement

**OVERHAUL**
- Minimum build life requirement
- Qualifying event definition
- PMA/DER repairs

**COMPONENTS**
- Dual release certificate
- 110% rule

**Requirements for detailed documentation (over and above aviation regulations)**
- Non-incident/accident statements for each operational period

**Build standard higher than operational requirement**
- Requirement for more detailed work-scope to qualify for reserve reimbursement
- Limitation of PMA parts and DER repairs

**Issue and retention of FAA and EASA certificate (on top of local certification)**
- Requirement to install similar or better parts
Maintenance reserve process

The theory

What are maintenance reserves?
- Monthly payments made to a Lessor to account for aircraft usage, to cover major maintenance events
  - Eliminates or reduces the lessor’s exposure to unfunded maintenance costs in the event of a lessee default
- Reserves are reimbursed to the lessee after the maintenance event occurs
  - Lessee is responsible for any shortfall
- Lessor typically keeps any excess reserve balance remaining at the end of the lease

<table>
<thead>
<tr>
<th>Item</th>
<th>Payment basis</th>
<th>Typical interval (Airbus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airframe 4C</td>
<td>Monthly</td>
<td>6 years</td>
</tr>
<tr>
<td>Airframe 8C</td>
<td>Monthly</td>
<td>12 years</td>
</tr>
<tr>
<td>Engine overhaul</td>
<td>Flight hours</td>
<td>3.5 years</td>
</tr>
<tr>
<td>Engine LLP</td>
<td>Flight cycles</td>
<td>6,000-20,000 cycles</td>
</tr>
<tr>
<td>Landing gear</td>
<td>Monthly</td>
<td>10 years</td>
</tr>
<tr>
<td>APU</td>
<td>APU hours</td>
<td>2.5 years</td>
</tr>
</tbody>
</table>
In reality the mechanism doesn’t always work in the airline’s advantage:

1. Maintenance reserve rates vary between lessors and are often an average.
2. Future cost savings do not benefit the airline as rates are fixed.
3. Cash payments precede the actual event, claim reimbursement takes time & no interest is paid.
4. Exclusions of items from maintenance events.

A protection mechanism for the lessor, but a burden for the airline.
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Redelivery

The airline faces many challenges

- There were more than 1400 aircraft transfers between regulatory jurisdictions in 2013
- Dissimilar regulatory requirements between aviation regulations present a series of unique challenges
- Differences in these regulatory requirements result in US$369 million annually for the aviation industry

Redeliveries - unexpected cost

Cost of a poorly managed redelivery event can be significant

Sum of actions which results in high cost;

- Back to birth traceability is missing or does not meet lessor’s standards
- Missing component or modification certification
- Incomplete repair file
- Significant effort at redelivery to bridge the aircraft back to the MPD and to meet the lessor’s standards
- Interior standard does not meet lessor’s requirements and their definition of “normal wear and tear
- Delayed delivery results in penalty rents

![Bar chart showing the cost breakdown of redeliveries](chart.png)

- Total: ~$1.1M
- Back to birth: ~$350k
- Component certificates: ~$200k
- Repairs: ~$250k
- Interior: ~$100k
- C-Check: ~$200k
## Redeliveries – hidden cost

Maintenance intervals are often not used to the full extend

<table>
<thead>
<tr>
<th>C-Check interval</th>
<th>Hard Time Components</th>
<th>Wheels / Brakes</th>
<th>Airworthiness Directive compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The C-Check interval is often not used to the full extend</td>
<td>Hard Time components require 12 ~18 months life remaining life</td>
<td>Wheels and brakes require 50% life remaining</td>
<td>All AD’s due in the upcoming 12 months are required to be complied with</td>
</tr>
</tbody>
</table>

- **Airframe hidden cost**
  - Results in a higher maintenance cost / flight hour
  - Early replacement of parts
  - Early replacement of parts

- **Engine hidden cost**
  - Redelivery shop visit
    - Return conditions may result in an early removal shop visit due to performance or LLP restrictions
  - Engine shop visit planning may help to avoid this additional shop visit

- **Engine hidden cost**
  - Additional work required to perform the terminating action and comply with all AD’s
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Conclusion

Maintenance cost increases as a result of additional requirements of the lease

Airlines cannot fully benefit from operational maintenance cost improvements

Create a standard lease agreement
Alternative maintenance reserve mechanisms

How can this improve?

Create maintenance reserve benchmark
QUESTIONS.....

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