Airlines’ Accounting Policies on Aircraft Depreciation and Maintenance Capitalization

An Exclusive Benchmark Analysis by IATA’s Maintenance Cost Task Force
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This article provides information about some airline accounting practices from a practitioner’s perspective. For the official accounting policies of airlines around the world, each airline’s Financial Reporting/Accounting and Investor Relations Department should be contacted as well as experts in accounting firms working on the specific subject.
1. INTRODUCTION

The objective of this survey is to provide benchmark information and “best practices” regarding airlines' accounting policies for aircraft depreciation and maintenance capitalization. For proper accounting treatment (financial reporting to governments, shareholders, etc.), an airline should seek expert accountant assistance.

METHODOLOGY

IATA conducted a survey on “Airline Aircraft Depreciation and Maintenance Capitalization”. This survey took place from June to October 2011. 50 airlines participated, representing over 5,100 aircraft (25% of world’s fleet). Fleet sizes ranged from less than 10 to more than 700 active aircraft*.

Aircraft depreciation was divided in two areas:

- Aircraft as a whole
- Airframe, Engines, LLP, rotables and consumables (for the airlines that depreciate airframe and certain high value components separately)

Maintenance capitalization covered events such as heavy checks, engine shop visits, component maintenance and modifications.
2. AIRCRAFT DEPRECIATION

Depreciation is a non-cash expense that is reported in a company’s financial statements. Depreciation reduces the net book value of the asset as a result of wear and tear, age (deterioration) or obsolescence. Because it is a non-cash expense, depreciation lowers the company’s reported earnings. Depreciation is an exercise in cost allocation undertaken to match the cost of assets to the revenues earned during the periods the assets are used. Reduction of annual depreciation amounts results to reporting higher net income or reduced losses; these results are linked to many airline decisions regarding shareholders, management, unions etc.

Aircraft depreciation is a large airline expense and reflects the decrease of the value of the asset (aircraft) or the allocation of costs to replace the aircraft when time is due. Both decrease of value and allocation of costs are depicted on an annual basis.

The survey asked airlines to provide information on the major items related to depreciation treatment:

- the cost of the asset/aircraft (assumed at 100%),
- the expected salvage value (as % of acquisition value), also known as the residual value of the asset,
- the estimated useful life of the asset, and
- the method of apportioning the cost over such life (depreciation method)

It should be noted that depreciation is not an attempt to measure the current value of the aircraft. Current (market) value is determined by market conditions (agreement on price between seller and buyer). Many factors are considered when estimating the economic life and residual value of a commercial aircraft. These factors include but are not limited to: physical or economic life, corporate strategy, planned use, expected technological changes, aircraft/fleet replacement policy etc.

Depreciation practices have changed as flight equipment and industry conditions have changed. In general, the fleet replacement cycle has lengthened; production and delivery backlogs have played a role as well as any profitability targets set by the airline’s management. Additionally, competition and regulation played a significant role in extending the expected life of an aircraft. Once the rules of aircraft depreciation have been set, it can be cumbersome for the airline to go back and change its depreciation policy. One rare case that an airline can change depreciation policy is during a bankruptcy filing (e.g. “Chapter 11” filing in the USA). In this case a “fresh start” accounting is allowed and required to reset the historic net book value of the assets and liabilities to fair value; in this case, the airline is becoming a new entity for financial reporting purposes.

It should be noted this report is for information, the airline needs the expertise of certified accountants who have the knowledge of national
and international accounting rules, and are fully aware of the airline’s financial objectives.

The following sections cover depreciation of airframe, engines, LLPs, rotables, inventory (i.e. consumables) and repairables.

From our sample, 5 airlines do not use depreciation at all since their whole fleet is under operational leases. The remaining airlines have aircraft that are under lease agreements or fully owned.

2.1. AIRFRAME

Sixty-six percent (66%) of the airlines surveyed depreciated airframe and engines together.

Aircraft depreciation schedules varied across airlines: depreciation period (useful life) ranged from 8 to 30 years with a residual value from 0 to 20%.

Straight-line depreciation is being used; there was not a single airline that used any other form such as accelerated depreciation*.

The next graph shows the average depreciation period and residual value for each airline (red) as well as all the airlines’ depreciation policies. The size of the dots is proportional to the number of airlines they represent.

* Accelerated depreciation is a method of depreciation that allows greater deductions in the earlier years of the life of an asset, whereas the straight-line depreciation method spreads the cost evenly over the life of an asset.
54% of the surveyed airlines had a single depreciation policy for their entire fleet but we also noted that some applied different rules (depreciation period and residual value), based on a great variety of parameters.

The following examples illustrate the different accounting practices but cannot be considered as a trend, due to the limited information.

- Ownership: leased aircraft depreciate faster than owned aircraft, and residual value of leased aircraft is generally lower.
- Aircraft age (2 airlines): new aircraft are depreciated over a longer period with a higher residual value than used aircraft.
- Aircraft operational role: passenger aircraft are depreciated more rapidly than freighters, residual values slightly differ.
- Short haul vs. long haul (1 airline): aircraft operated on short hauls are depreciated faster than long hauls.
- Network (1 airline): aircraft operated on domestic routes are depreciated faster than international routes.
Aircraft type or market group (18 airlines): most of the airlines use the same schedule for Narrowbody and Widebody aircraft, only 4 airlines reported different schedules. TP & RJs (not many data points) have a shorter depreciation period and a slightly higher residual value.

In general, North and South American carriers depreciated their aircraft over a longer period than the rest of the world.

### 2.2. ENGINES

This section covers engines that are not depreciated with the airframe and/or spare engines.

26% of the reporting airlines depreciated engines separately from airframe.

On average, depreciation period was around 19 years and the residual value around 8%.

<table>
<thead>
<tr>
<th>Averages</th>
<th>Depreciation Period</th>
<th>Residual Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widebody</td>
<td>19.6 yrs</td>
<td>9%</td>
</tr>
<tr>
<td>Narrowbody</td>
<td>19.8 yrs</td>
<td>7%</td>
</tr>
<tr>
<td>Regional Jet</td>
<td>18 yrs</td>
<td>15%</td>
</tr>
<tr>
<td>Turbopop</td>
<td>17.6 yrs</td>
<td>8%</td>
</tr>
</tbody>
</table>

Table 1: Average Aircraft Depreciation Period & Residual Value by Market Group
The graph below shows the depreciation policy airlines used for spare engines only. 24% of the responses stated a specific policy for spare engines.

Figure 8: Average Engines Depreciation Period & Residual Value

Figure 9: Average Spare Engines Depreciation Period & Residual Value
2.3. COMPONENTS AND SPARE PARTS / "INVENTORY"

This section focuses on LLPs and Rotables.

For LLPs and Rotables, we identified four main practices:

- No depreciation: LLPs and rotables are expensed.
- Depreciation during a fixed period of time:
  - Aircraft useful life
  - Predefined number of years
- Depending on operations:
  - Usage, number of flight cycles, etc.
  - Estimated time until next shop visit
- Depending on engine type

Among our surveyed airlines, only one was using accelerated depreciation* for components.

Most airlines (80% of our pool) did not depreciate spare parts "inventory". For those that used depreciation, it was:

- over a fixed number of years from 5 to 30 years, with a residual value from 0 to 10%
- over a period based on lease period, estimated ownership or useful life of A/C

* Accelerated depreciation is a method of depreciation that allows greater deductions in the earlier years of the life of an asset, whereas the straight-line depreciation method spreads the cost evenly over the life of an asset.
3. MAINTENANCE CAPITALIZATION

Maintenance events such as airframe heavy checks and aircraft engines overhauls can be very costly, well exceeding US$ 1 Million and at times $5 million. Many airlines treat these events as expenses. These expenses can add significant volatility (fluctuation) to an airline’s income statement; especially for airlines with relatively small operational budgets.

Current International Financial Reporting Standards (IFRS) allow for certain maintenance events to be capitalized. The airline has to specify the certain rules used in applying such treatment. These rules are very similar to the treatment of aircraft depreciation as indicated above. It should be noted that under US Generally Accepted Accounting Principles (US GAAP), maintenance costs are in general treated as expenses in the period incurred.

As an example of a current airline practice, an airline may have a cash payment for a maintenance event, and may depreciate the cost of the event over the calendar interval until a similar event occurs in the future (usually about 6 years). This treatment gives the opportunity to the airline to smoothen its expenses over time, and not to show very high peaks and valleys due to aircraft heavy maintenance.

A number of airlines use “Maintenance Reserves” (MR) as a provision to cover the expenses of future maintenance events. MR have two origins:

1. Lease agreement requirement. Depending on the airline’s credit risk, the lessor will require that the airline pays periodic payments (usually on a monthly basis) to cover future maintenance events. Mainly, this protects the lessor in case of an airline default. In such case of default, the lessor will have to pay for the full maintenance event cost although the lessee operated the aircraft and was supposed to pay for its maintenance. The costs covering the MR in the case of leasing an aircraft are operating expenses and show in the airline’s income statement at year end; money is paid to the lessor or an externally controlled fund and the operator-lessee will never receive this money in the future (the funds will be used to cover the future event). IATA is working on a detailed article regarding MR and best practices for methodology to better understand how MR work (to be available in 2012).

2. Provision to cover future events. An airline can set aside funds as a provision to cover future maintenance events. In such a case, these funds will be recorded as a liability in the airline’s balance sheet and will be used (expensed) when the event occurs by depleting the MR fund.
This chapter covers capitalization policies as well as thresholds above which maintenance events are depreciated.

The maintenance events addressed below include airframe maintenance (heavy checks); engine maintenance (shop visits and LLPs); component repairs or exchange (thrust reversers, APU, landing gear); aircraft modifications and asset improvement.

Intangible assets such as maintenance events usually have been fully depreciated (i.e. no residual value) as they were not resalable at the end of the depreciation period.

Differences in practices may have appeared depending on regional criteria but the size of the surveyed airlines (in terms of active aircraft) didn’t seem to correlate with the capitalization policy.

### 3.1. AIRFRAME

Checks are periodic inspections that have to be done on all aircraft after a certain amount of time or usage (e.g. number of flight hours or cycles). Depending on the scope of work, checks are referred to as A-, B-, C- or D-check. A- and B-checks are lighter checks, while C- and D-checks are extensive inspections that require the aircraft to be put out of service until the check is completed.

In this section, we address C-Checks, Checks + 6-year airframe inspections and Checks + 12-year inspections.

68% of the responding airlines capitalized their airframe maintenance.

52% of our pool capitalized C-Checks + 12-year inspections. Half of them depreciated over a period of 12 years. The rest had different practices that varied from 4 to 10 years.

58% of our pool capitalized C-Checks + 6-year inspections. Most airlines used the same principle to depreciate the C-Checks + 12-year inspections and C-Checks + 6-year inspections (i.e. depreciation until next check), only one had a different practice for each.

Only 18% of our pool capitalized C-Checks, until the next check.

In terms of regional specificity, all our African and Middle Eastern carriers capitalized their heavy maintenance, as well as 75% of ASPAC carriers and 85% of European carriers. Most American carriers (N. Am 60%, S. Am 75%) and Chinese carriers (67%) did not depreciate heavy checks.

Only 8% of the responding airlines capitalized airframe maintenance above a certain monetary amount.
The average thresholds were:
- C-check: no threshold
- Check + 6-year inspection: $200K to $915K (2 airlines)
- Check + 12-year inspection: $200K to $1,350K (3 airlines)

3.2. ENGINES

For engine maintenance, the survey focuses on two items: engine shop visits and engine LLPs (if separate from Engine Shop Visit).

34 out of 50 airlines (66%) capitalized ESVs. Nine of them (18% of total pool) depreciated only above a certain amount, ranging from $250K to $4.35M. Some of them had a different threshold depending on the engine type.

Reported depreciation periods varied as follow:
- Until next ESV or shop interval (8 airlines)
- Based on usage, e.g. flight hours, flight cycles (2 airlines)
- Fixed number of years from 2.5 to 10 years (16 airlines)
- Based on MTBR (3 airlines)
- Based engine condition monitoring (2 airlines)

Engine LLPs’ maintenance has been only capitalized by 24% of our airline pool, 3 of them had a threshold ranging from $500K to $4.7M.

We identified three main practices with regards to depreciation period:
- Fixed number of years: 3 to 10 years (6 airlines)
- Based on LLP life (2 airlines)
- Based on usage (1 airline)

3.3. LARGE COMPONENTS REPAIRS

This section addresses capitalization policies for the repair of the main aircraft components: thrust reversers, auxiliary power units (APU), landing gears.

Capitalization of component maintenance was not a common practice; 36% of the responding airlines capitalize any type of component maintenance. It varied depending on the component: Landing Gear Repair & Exchange have been capitalized by 36% of the participating airline whereas Thrust Reversers and APU Repairs have only been depreciated by 18% and 26% respectively.

Few airlines had threshold above which they capitalized component maintenance and amounts varied:
- LG: $100K to $330K (5 airlines)
- APU: $50K to $320K (3 airlines)
- TR: $50K to $1M (4 airlines)
3.4. MODIFICATIONS

The survey covered aircraft modifications (e.g. cabin upgrade, IFE, etc.) and asset improvements or betterments (e.g. winglets, engine upgrade, etc.).

The costs of aircraft modifications have been capitalized by 76% of our airline pool; the depreciation period usually depended on the remaining useful life or leased period of the aircraft.

The proportion dropped to 66% when it came to depreciating the costs of asset improvements but the depreciation period followed the same pattern as aircraft modifications.

The threshold above which modifications have been capitalized significantly varied from one airline to the other: from $100K to $1M.

4. CONCLUSION

Aircraft depreciation policies varied across airlines. Depreciation period ranged from 8 to 30 years with a residual value of 0 to 20%. On average, depreciation period was about 19 years and residual value was around 10%.

The majority of airlines (over two thirds) capitalized heavy maintenance and engine overhauls. About one third or less of the respondents depreciated any maintenance events for large components. Only 20% depreciated consumables.
# ANNEX 1

## LIST OF PARTICIPATING AIRLINES

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IATA’s Maintenance Cost Task Force (MCTF)

WHY PARTICIPATE IN MCTF?

- MCTF is the industry focal point on commercial airline maintenance costs, including MRO (Maintenance, Repair and Overhaul) cost strategies.
- By joining MCTF, airlines benefit from access to unique tools which permit benchmarking against industry performance covering 47 aircraft versions / 24 aircraft families, and providing for 36 airframe/engine combinations.
- Participation to MCTF is free of charge and open to any interested airline. More than 45 airlines are already members.
- MCTF offers the opportunity to discuss and benchmark key maintenance cost issues facing the airline industry and provides an effective platform for networking and sharing experiences.

COST VS. BENEFITS

- The data required for participation to MCTF’s data collection is already available at your maintenance and finance departments respectively. You just need to populate the input toolset with the relevant information.
- The input toolset is a user-friendly Excel form, developed in collaboration with Airbus. The output software designed with Boeing allows for customized analysis based on the specificities of each airline. Airline fleet performance can be benchmarked based on cost per flight hour, cost per aircraft, and cost per cycle (departure).

TIMELINE FOR AIRLINE PARTICIPATION IN MCTF 2012 EDITION

- June 30, 2012: Deadline for MCTF data collection
- July - September: Data analysis
- October:
  - 8th Maintenance Cost Conference (MCC)
  - e-MCTF toolset
  - Airline Maintenance Cost Executive Commentary (AMCEC)

MCTF’S NEW INITIATIVES

- Maintenance cost per aircraft tail number
- Maintenance Agreement Standardization
- Aircraft Leasing & Maintenance Reserves Methodology (Aircraft Leasing Task Force)

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