



Avoidable Showstoppers During Aircraft Transitions



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In a recent article I explained the importance of aircraft record keeping and digitalization of records to ease aircraft transitions, save costs and asset value. In this article I will try to highlight the most common pitfalls that can occur during aircraft transition projects. I have personally managed many such projects to support lessor and lessee customers where I have collected valuable firsthand experience and expertise.

The most important issues before starting an aircraft transition project for the parties are to have a clear understanding of their asset status and the status of the records. Starting a project blind will mostly cause long delays and budget risk exposure due to penalties and additional maintenance costs.

An aircraft transition requires good preparation in a timely manner. The lessee needs to know the exact lease return conditions, which are agreed upon during lease agreement execution, and compare the current Status of the aircraft, its parts, and related documents against these return conditions. The gaps between the lease return conditions and the current condition of the aircraft and its parts will be the basis of the

aircraft transition layover work package. The more the lessee knows about these gaps, the less risk will be faced during the aircraft transition phase and unexpected costs will be reduced or avoided altogether.

The following issues are the most common hurdles which jeopardize the time plan and budget plan during an aircraft transition.

Engine and APU condition

Engines are the most-costly part of an aircraft asset. Therefore, special attention needs to be given to the physical condition and performance condition of the engine.

A pre-Borescope Inspection can be a

precautionary action to see the physical status of the engine and an APU (Auxiliary Power Unit) and provides the lessee with the ability to adjust the works scope accordingly. This can save valuable time, since if an engine fails during the acceptance Borescope Inspection at the end of the layover, it will cause a significant delay from one month to six months depending on if the repair can be completed onsite or in the engine shop.

Engine health monitoring is a non-avoidable part of modern Maintenance programs and needs to be followed carefully. Even a certain Performance level allows the continuation of engine operation, but it may be not acceptable to the owner of the asset

during lease return. Mostly lease return conditions define a minimum Exhaust Gas Temperature Margin (EGTM) level. EGTM is the difference between the peak EGT reached during take-off and the certified max EGT, which is used to evaluate and follow engine health and possible time on-wing. The Operator follows the EGTM trend to see the health condition of the engine to calculate the engine replacement time and take the necessary action according to this projection. During the lease Return this parameter is an important indication whether the engine will be accepted or failed. Engine performance deterioration rate can be reduced with periodical engine washes during the operation period, but if the remaining EGTM is becoming too low or below the contractual level, a possible performance Shop visit needs to be considered before starting the Transition period.

Another important issue is the usage of Part Manufacturer Approval (PMA) Parts especially on Engine and APUs, but not limited. Parts Manufacturer Approval is an FAA design and production approval for aircraft parts which allows them to be installed to the aircraft and for its parts to be used as alternatives to OEM (Original Equipment Manufacturer) parts. The



Two CFM 56 Engines waiting to be repaired onsite

usage of such certified PMA parts can save the operator costs during the time of operation, but the lease contracts usually don't allow the use of PMA parts without any exception or don't allow the usage of PMA parts for critical Systems such as the engine and APUs. Principally, using PMA parts during operation on a leased Aircraft or engine is subject to lessors approval, but mostly this is not allowed and during the lease return the lessee operator needs to prove the non-usage of PMA parts with a statement. If an Operator uses PMA parts in their operation, these parts most probably would need to be replaced by OEM parts before the lease return, which causes additional costs.

Life-limited part Back to Birth (LLP BtB) issues

A life-limited part (LLP) is a part with a hard limitation mostly limited to flight Cycles but rarely also Flight Hours or calendar days. LLPs are mostly installed on Engines, APUs and Landing Gears.

Airlines are using more and more used LLPs as a replacement of an LLP which has reached the approved limit. The Operator calculates the remaining operation time of the asset and the required minimum LLP life during the lease Return and sources the appropriate LLP from the secondhand market. Installing used LLPs have a big cost saving potential

comparing to installing new LLPs which will cause high costs and give away the unused life-limit of the parts. The increased usage of used LLPs has caused a significant increase in the focus on LLP BtB Documentation.

Aircraft documentation is inspected in detail during the delivery and redelivery processes with special attention place on LLPs and their trace to birth (manufacture). Airlines are responsible for the safety of flight and they need to ensure that documentation meets airworthiness standards. Additionally such documentation is considered to be very important by the lessors and aircraft owners as it can have a significant impact on asset value



An A319 waiting for its two CFM56 Engines to be reinstalled after repair

and marketability of the aircraft or its parts such as Engine, APU, Landing Gear or the LLP as a standalone part.

The Problems begin mostly due to the differences between aviation regulation requirements vs. industry requirements considered to be commercial LLP transactions. Aviation regulations typically require an operator to know the current life status of its LLPs. However, to know the current status of the LLP is not sufficient for industry LLP transactions and the lessor or owner of the asset requires the full BtB traceability of each installed LLP such as all the removal installation Data, accumulated cycles and categories, incident/accident clearances, ownership status of the LLP from the time of birth up to the current transaction time.

Since this issue is becoming more and more important

during the aircraft transition process, the IATA Aircraft Leasing Technical Group prepared Guidance Material and Best Practices for Life-Limited Parts traceability in June 2020. This document helps industry professionals to better understand and have a guideline to follow during lease preparation. Beside the definitions the document provides a lot of information about the necessary documentation, considering different scenarios of transactions and some templates for the LLP Documentation.

To avoid any unexpectedly surprises the lessee operators need to check the LLP BtB traceability critically before they agree to buy and install subject LLPs. Furthermore, a BtB traceability review needs to be performed after each Shop visit and before the Aircraft transition process. A lack of proof about the birth traceability can lead to a number of unwelcomed financial repercussions.

Aircraft Structural condition

An aircraft can have many operators in its entire lifetime, and during operations structural damages will occur, where some of them are within limits as per the Structure Repair Manuals (SRM) and can be left as is, and some of them are beyond the limits and need to be repaired as per the Structure Repair Manual or Original Equipment Manufacturer (OEM)s instructions. All these events need to be documented in a proper way and must be listed in a Dent and Buckle, Repair chart. All the necessary documentation with necessary information such as the Structure Defect Reports, SRM extracts, Material Information, Work Orders, required Nondestructive Test (NDT) inspection Reports, OEM instructions

etc. must be kept in proper order assigned to each Structure Item.

The operators should update these documents continuously during asset operation and performing a full structural assessment of the aircraft is highly recommended in an appropriate Layover mostly within C Checks prior to the Lease return layover. This will help to expose any gaps between the current existing structural damages, repairs, and the respective Documents. This can allow time for the operator to search for the missing documentation from the historical records. If a lack of documentation is discovered for an existing repair during the lease return process, the end result may end up being a requirement to remove the existing repair and perform it again which causes unnecessary costs and time delays for the transaction target.

The IATAs Guidance Material and Best Practices for Aircraft Leases Annex V provides valuable information about Structural Repair files and it can be used as a Guideline during the preparation of Structural Repair files.

Aircraft Cabin condition

It is typical for Aircraft Cabins to undergo some refurbishment, cabin layout changes during the change of operators or during the lease term of one operator. These cabin layout changes are mostly performed with OEM Service Bulletins or Design Organization Approved (such as EASA Part 21 Approval) Change Bulletins. These changes need to be documented very well and the spare parts need to be secured for continuous operation. Aircraft cabins usually suffer damage due to heavy usage and the fact that they are being kept within an operator's standard which is not always the industry standard. Cabin material is mostly subject to long lead times, up to 6 months. This will cause delays on the aircraft transition layover since the parts are almost never delivered within the layover period. Cabin defects depend on the category, as cosmetic or if it is an airworthiness

issue it may delay the entire Transition process or at least it has a financial impact in the form of compensation during the acceptance process.

The Operators need to have a continuous overview on the Cabin status and maintenance firstly for their commercial appearance to the passengers and for the lease return process. Therefore, a dedicated cabin team can have more control over the status of the aircraft cabin on the entire fleet and can order the required parts in advance of the aircraft transition layovers to avoid unnecessary delays in the process.

The core interest of Operators is to operate the aircraft safely and cost efficiently, therefore they often concentrate more on daily operational requirements and tend to ignore or not pay sufficient attention to the lease return conditions in a proactive and timely manner. A professional team experienced in the aircraft transition management can help to prepare the aircraft and its records for the Lease return without any daily operational stress. Investing in proper preparation can save extra expenditures, time, and stress ☑



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