

Navigating the Skies: A Comprehensive Guide to Aircraft Leasing and Minimizing Exposure

Sofema Aviation Services (SAS) <u>www.sassofia.com</u> takes a deep dive into the business process of Aircraft Leasing and considers various best practices which can be used to minimize exposure.

Aircraft leasing is a strategic option for airlines seeking flexibility and financial efficiency.

- By understanding lease types, conducting thorough due diligence, negotiating favorable terms, implementing risk management strategies, maintaining open communication, and preparing for lease return, you can minimize exposure and maximize the benefits of aircraft leasing.
- Equip yourself with the knowledge and resources to navigate the intricacies of aircraft leasing, ensuring a smooth and profitable journey in the skies.

Understanding Lease Types (Choosing your Lease)

Clearly define your operational needs and budget constraints to select the lease type that best suits your requirements.

- Align the lease term with your operational needs, considering both short-term and long-term implications.
- Negotiate competitive rates based on market conditions, aircraft type, and lease duration.

Dry Lease: This type of lease provides the aircraft only, without crew, maintenance, or insurance. The lessee is responsible for operational control of the aircraft.

Wet Lease: In contrast, a wet lease includes the aircraft, full crew, maintenance, and insurance. The lessor maintains operational control.

Damp Lease: A damp lease is a hybrid, where the aircraft plus some additional crew are provided.

General Considerations

- Ensure Open Communication
- Keep the lessor informed about the aircraft's operational status and maintenance activities.
- Establish clear communication channels and dispute resolution mechanisms in the lease agreement.
- Foster a transparent and cooperative relationship with the lessor to facilitate smooth operations and conflict resolution.

Risk Assessment (Before Lease Initiation):



Implementing risk strategies and adhering to best practices will help you mitigate exposure when leasing used aircraft. Keep in mind that the specific time scales and strategies may vary based on individual circumstances,

- It is essential to tailor your approach to the unique characteristics of each leasing arrangement.
- Where necessary consulting with aviation industry experts and legal advisors to ensure comprehensive risk management.
- Start this process well in advance, ideally several months before the lease initiation.
- Conduct a comprehensive risk assessment to identify potential risks associated with leasing a used aircraft.
 - This assessment should consider factors like the aircraft's age, maintenance history, market conditions, and lessee's financial stability.

Airworthiness Compliance & Due Diligence on the Aircraft:

- Airworthiness compliance is governed by a complex web of national and international regulations.
 - Lessees must stay abreast of the applicable regulations and ensure that the aircraft is maintained and operated in compliance with these standards.
- Begin due diligence as soon as a potential aircraft becomes available for lease.
- Review the aircraft's maintenance records and history to ensure it meets airworthiness standards. (Perform a Full Equivalent Airworthiness Review records Inspection (ARC)
- Evaluate the aircraft's maintenance and repair costs over its remaining life.
- Inspect the aircraft's maintenance records, age, and condition to avoid unforeseen operational issues.
- Conducting thorough pre-return inspections allows lessees to identify and address any issues related to maintenance or airworthiness compliance well in advance of the lease return date. This proactive approach helps to avoid last-minute surprises and ensures a smoother transition.
- Airbus and Boeing employ Airworthiness Limitation (ALS) and Maintenance Planning Document (MPD) to provide information and guidance to ensuring safety and compliance with all regulatory standards.
- EASA, the European aviation safety agency authors in harmony with the FAA a series of Certification Specifications (CS). CS25, identifies the requirements for "Large Aeroplanes" during their certification process. CS26, identifies the additional Airworthiness Specifications for Operations.

Aircraft Maintenance Program (AMP)Considerations

- The AMP is a tailored document crucial for the Operators Regulatory Approval and typically managed by the Continuing Airworthiness Management Organization (CAMO) of an aircraft.
- The AMP encapsulates the maintenance tasks, intervals, and procedures tailored to the specific needs and operational profile of the aircraft.
 - $_{\odot}\,$ Ensuring reliability and safety is at its core, making it an indispensable tool in aircraft maintenance.



• The Aircraft Reliability Program must be designed considering the aircraft or fleet's reliability, ensuring all potential issues are preemptively addressed.

• The aircraft's operating environment and other pertinent factors can influence maintenance intervals and tasks. It's not uncommon to find different intervals for the same aircraft type in distinct AMPs.

Market Analysis:

- Continuously monitor the aircraft market leading up to the lease initiation.
- Consider the demand for the specific aircraft type and how it may affect lease rates.
- Analyze current market conditions to determine fair lease rates and terms.

Financial Assessment of Lessee / Lessor:

The physical elements of the actual aircraft can lead to significant penalties.

The correctness of the aircraft technical records can often have financial significance so may also become contentious during discussions.

Performance requirements (for example EGT Margin) shall meet the lease obligations – major costs could be implicated in this area even requiring an engine shop visit (ESV).

The aircraft must be certification criteria (For example STC not certified under an EASA / FAA bi-lateral will not allow an aircraft to be certified within Europe or North America.

Certification requirements, the focus being to ensure compliance with local regulatory authority requirements and, where cross-border transfers are concerned, compliance with the next lessee's regulatory requirements.

- Begin the financial assessment as soon as negotiations start with a potential lessee / lessor
- Review financial statements and credit history (for lessee)
 - Assess the lessee's ability to meet lease payments and other financial obligations.
- Consider requiring a security deposit or letter of credit as a risk mitigation measure.

Legal and Contractual Protections:

- Develop and finalize lease agreements with legal experts well in advance.
- Ensure the lease agreement includes clear terms and conditions, including maintenance responsibilities, insurance requirements, and default remedies.
- Establish a dispute resolution mechanism in case conflicts arise.

Insurance Coverage:

- Arrange for insurance coverage before the lease initiation / Verify that the lessee has the required insurance coverage.
- Ensure the aircraft is adequately insured against various risks, including damage, loss, liability, and business interruption.

Maintenance and Operational Support:



- Determine maintenance and operational support well in advance of lease initiation.
- Consider the Aircraft Maintenance Program (AMP) which will be employed.
 - Note AMP's are the responsibility of the Operator and are not transferrable
 Identify the maintenance plan that outlines scheduled inspections, repairs, and overhauls and supports all Continuing Airworthiness Tasks

What are Aircraft Maintenance Reserves?

Maintenance reserves are calculated to cover use of aircraft for some of the life limited parts:

- For Fixed Wing Aircraft the focus is on Major Components for example Engines, APU, Propellers, Landing Gears, For Helicopters again Engines, also Gear Box, Main Rotor Head etc.
- The essential purpose of Maintenance Reserves is to calculate the cost of consumption of potential typically on a per hour basis
- If the time between to overhaul is 5000 hours for a propeller and the cost of typical overhaul is 15000 Euro then the maintenance reserve for a propeller per hour is 15000/5000= 30 Euro / Operating Hour.

The service time is identified either in Flight Hours or Flight Cycles per OEM MPD.

- So, this service time is the driver of the MR calculation. For example if for example the Air-frame time is 20,000 Flight Hours for next Air-frame Overhaul and the cost of Air-frame Overhaul Cost is 800, 000 USD which is found from OEM OR MRO based on Aviation Industry Information.
- Therefore, the Flight Hour rate is determine by dividing Air-frame Overhaul Cost by Air-frame time so it will be 800,000/20,000 = 40 USD PER FLIGHT HOUR. Thus any airline or maintenance organization should reserve 40 USD for Each Flight Hour Service time in order to finance the total maintenance cost in future when the Air-frame Overhaul Time is due.

At the lease end a close out calculation is performed to cover the use of the propeller during the lease. If there is more potential available on the propeller at the end of the lease than at the beginning, the Lessee normally receives a compensation.

- Of course if there is less potential at the end of the lease than at the beginning the Lessee may in fact be required to pay a compensation to the Lessor.
- Often when developing criteria for the Maintenance Reserve Ground rules the following points to be considered
- During the maintenance check the aircraft is not flying so no reserves are due.
- In addition typically during the initial period say 1 month again no reserves are due.
- When either an Engine or APU is on maintenance the assumption is that a loan item is deployed so the maintenance reserve payments will fall due



- In respect of Engines and APU's typically whilst on Maintenance no specific payments are normally required for these units
- Often there is no adjustment made for Engines which are operating in Hot & High Conditions.
- Inflation may also not be included when calculating forward reserves.

In essence, maintenance reserves are intended only for routine maintenance, being major events such as Heavy Maintenance Visit HMV, Landing Gear Overhaul LDG overhaul, engine overhaul, engine Life Limited Part LLP replacement and Auxiliary Power Unit APU performance restoration.

Within these packages there will of course be various "non-routine" findings for which the maintenance reserve will be used to pay for, however the principle event itself remains a routine maintenance task.

typically in the case of incident or accident, there is no mechanism for maintenance reserves to be paid or to be claimed for on accidental damage.

Of course in respect of managing financial risk Insurance will be the typical vehicle of mitigation.

As a final cautionary note maintenance reserves, especially during end of lease returns, have effectively become an additional "less visible" additional form of payment.

Exit Strategy:

- Develop an exit strategy before the lease initiation.
- Plan for the end of the lease, including aircraft return conditions, inspections, and financial settlements.
- Consider options for lease extension or aircraft purchase at the end of the lease term.

Continuous Monitoring:

- Continue to monitor the aircraft's performance and market conditions throughout the lease term.
- Stay updated on the lessee's financial health and compliance with lease terms.
- Adapt risk mitigation strategies if conditions change.

Documentation and Records:

Lease agreements typically include specific clauses related to the maintenance, operation, and return condition of the aircraft. Failure to maintain complete and accurate records can result in disputes between lessors and lessees, potentially leading to costly penalties or legal actions.

- Aircraft records serve as a comprehensive history of the aircraft, documenting everything from routine maintenance and repairs to major overhauls and modifications.
- These records are crucial for assessing the aircraft's current condition and ensuring
- that it has been maintained in accordance with the applicable regulations and standards.



• Properly maintained and documented aircraft not only comply with regulatory requirements but also preserve their market value. Prospective buyers or lessees place a premium on aircraft with comprehensive and well-organized records, as they provide assurance of proper maintenance and compliance with airworthiness standards.

• Missing or inaccurate entries in the aircraft's maintenance logbooks can create significant challenges during the lease return process.

 $_{\odot}\,$ Lessees must ensure that all records are complete, accurate, and reflect the actual condition of the aircraft.

• Discrepancies between the aircraft's physical condition and the maintenance records can raise red flags for lessors and regulatory authorities.

 $_{\odot}\,$ It is crucial to reconcile any discrepancies well before the lease return to avoid delays and potential penalties.

Navigating the Turbulence: Aircraft End of Lease Return, Records, and Airworthiness Compliance

Over 13,000 large aircraft operating in 2021 are under a lease agreement and as such is subject to the requirements of the lease agreement.

The Lease Agreement contains provisions related to the termination and return of the aircraft.

It is an important process and one which is understood in detail by the lease company and often overlooked by the lessee. (often at a great cost!)

A typical redelivery obligation is for the aircraft to be capable of operating without requiring major maintenance. (usually for a period equal to 1 "C" check)

The end of an aircraft lease agreement is a critical juncture for both lessors and lessees, marked by meticulous inspections, comprehensive reviews of maintenance records, and rigorous assessments of airworthiness compliance.

• Ensuring a smooth transition requires attention to detail and proactive management of potential issues related to aircraft records and airworthiness.

End of Aircraft Lease Considerations

• The aircraft end of lease return process is a complex and challenging endeavor, requiring meticulous attention to aircraft records and airworthiness compliance.

• By adopting a proactive and comprehensive approach to records management and maintenance, lessees can ensure a smooth and efficient transition, preserving the value of the aircraft and maintaining compliance with regulatory standards.

• Ultimately, navigating the turbulence of lease return requires diligence, collaboration, and a commitment to upholding the highest standards of aircraft maintenance and airworthiness.

Aircraft Lease Transitions - What happens during lease return?

- It's crucial to align the AMP thresholds and tasks with the new operating conditions.
- This may involve completing specific tasks or resetting intervals to a standard baseline, often referred to as MPD (Maintenance Planning Document) intervals.



• This process, is typically termed a "bridging check," and is used to align the aircraft with its new maintenance program.

The Role of the Dent and Buckle

The "Dent and Buckle" chart is a vital document detailing any repairs made to the aircraft, ensuring that all maintenance actions are accounted for and comply with airworthiness standards.

• The chart provides a comprehensive overview of the damage, including its location, description, component affected, repair status, and any imposed limitations – the information should be traceable to specific work elements and Repair authorizations

Airworthiness Limitation Section (ALS)

The ALS is a crucial document used by Airbus for maintenance, broken down into various parts to cover different topics. One such part is the Safe Life Airworthiness Limitation Items (SL-ALI), highlighting components with life limitations that must be replaced after a defined lifespan to maintain aircraft safety. Another part is the Certification Maintenance Requirements (CMR), mandating specific maintenance tasks to ensure continued airworthiness and safety compliance. Understanding the applicability of these documents is vital, ensuring that the aircraft details match the specifications mentioned in the ALS.

Inspection of the Aircraft and Associated Documentation

- To ensure & confirm that the lessee has fulfilled all Continuing Airworthiness and "other" documented obligations.
- To ensure the aircraft return complies with all redelivery conditions described in the lease.

Aircraft Lease Return Process Considerations

The aircraft redelivery "will be" a (potentially expensive) and time-consuming burdensome period. It is for this reason that ensuring a well-organized and systematic process is essential to try to reduce both the "pain" and unnecessary cost burden.

Key Issues which can impact a successful lease return

- The aircraft physical inspection process usually takes many hours to complete is potentially subjective and can create stress where the aircraft is required for the next client and frustration where there is no "next customer" waiting for the aircraft.
- Correlation between dent & buckle physical status of the aircraft and the document records and repair records.
- All damaged to be assessed for compliance with the SRM, it is important to ensure the correct classification.

• Borescope inspections can be something of an unknown with the potential for out-oflimit findings – borescope at least months in advance to gain confidence (not a guarantee) however may help to avoid a costly delay due to an borescope failure.

Maintenance Planning Document (MPD)

The Role of the MPD



The Primary Source of the Operators Aircraft Maintenance Program (AMP) is the Maintenance Planning Document (MPD).

- The MPD is actually an "unapproved" document and is essentially a repository for multiple maintenance requirements coming from other documents (so-called "sources") such as the Airworthiness Limitation Section (ALS) or the Maintenance Review Board Report (MRBR).
- The MPD establishes the link between the requirements and the maintenance procedures listed in the Aircraft Maintenance Manual (AMM). The MPD also contains additional information to help operators in the organization of maintenance (e.g. access information, man-hours, elapsed time, required skills, etc.).
- Optimization of maintenance programme intervals essentially relies on scheduled and unscheduled data collected by the manufacturer from different operator environments, aircraft utilisation, aircraft configuration, aircraft age, etc. (Without operators' data, manufacturers do not have the means to optimize maintenance tasks.)

Note - there are different MPD concepts depending on the aircraft manufacturers.

Airbus MPD identifies all repetitive scheduled maintenance requirements and consolidates within the source documentation whereas other aircraft manufacturers may consider the MRBR only, or the MRBR and the ALS.

Special attention should thus be paid when comparing MPDs between aircraft from different manufacturers.

The MPD can be used as a source for all three groups but it must be ensured that requirements issued since its publication are not overlooked.

Note – It is essential to ensure that operators implement a thorough aircraft configuration management to only select tasks applicable to their fleet and, more importantly, not to miss any requirements that apply.

Example – A320 Family MPD lists about 3,000 maintenance requirements for all models. Customized at aircraft level in an operator's AMP this number is reduced to approximately 1,000 tasks.

Manufacturer Maintenance Requirements for Revision / Evolution

ALS and MRBR are developed in the frame of the initial Type Certification (TC) & typically are kept up-to-date for the duration of the life of the programme.

There are three major triggers for a maintenance programme revision:

• Regulation changes



- Configuration changes (aircraft modifications)
- In-service experience feedback
- Manufacturer Maintenance Requirement Summary

The manufacturer maintenance requirements are published in multiple documents (e.g. ALS parts, MRBR, etc.) and developed according to quantitative and qualitative analyses.

The Role of the Certification Process / MRB Process is to:

- Demonstrate compliance with instructions for continued airworthiness regulations according to industry standards (e.g. MSG-3)
- Approved by the certification authorities
- Envelope the entire fleet for a given programme and cover all possible configurations.
- Provide a list of maintenance requirements sorted by ATA chapter
- The Operators AMP shall list all requirements:

From the manufacturer's regulatory compliance documentation (e.g. MRBR, ALS, Certification Maintenance Requirements (CMR's) as well as specific procedures applicable to the operator's fleet).

From the manufacturer's recommendations (e.g. SB, SIL and OIT) (As Applicable) – provided the operator's engineering office considers them to be effective in the local operational environment.

- Coming from Airworthiness Directives (AD).
- Imposed by the operator's NAA and national laws
- Coming from the operator's in-service experience.
- Coming from any aircraft Supplemental Type Certificate (STC).
- Note Operators may not deviate from the ALS and AD requirements applicable to their fleet. However, regarding the MRBR, operators have the possibility to deviate from the published requirements according to procedures agreed with their NAA.

• Complementing the ALS is the Airbus MPD, a comprehensive tool that includes information from various ALS groups. However, it does not encompass all ALS information, making it essential to understand how the MPD and ALS interact. The MPD serves as a foundation to build the aircraft maintenance plan, incorporating additional sources and considerations.

Key Considerations in Aircraft Maintenance

- Maintenance documentation must be considered alongside other documents and factors, including:
- Service Bulletins: Informing operators about non-mandatory changes.
- Airworthiness Directives: Mandatory instructions from aviation authorities to address safety issues.
- Other Factors: Such as reliability, modifications, and national requirements.
- Boeing Maintenance Planning Data (MPD) Document



• The Boeing MPD is an OEM document outlining maintenance tasks, intervals, and notes crucial for maintaining aircraft. It is designed to cover aircraft and aspects for which Boeing is responsible, but it may not cover all maintenance details, especially for customized or complex components.

Sections of Boeing MPD

The Boeing MPD typically includes sections such as system maintenance, structural maintenance, zonal inspection, source documents for tasks, and airworthiness limitations and certification maintenance requirements.

• Each maintenance task within these sections is detailed with specific information, including item number, MRB categories, task type, interval, location, and applicability.

Next Steps

The following courses are available as online training with www.sofemaonline.com

- EASA Part M Maintenance Planning Essentials for Lease Companies
 - Managing Aircraft Lease Agreements and Maintenance Reserves
- Aircraft Technical Records Specialist Lease Management for CAMO & TR Staff

For additional questions or comments please email team@sassofia.com