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AVIATION ADVISORY

Maximizing Returns Through Effective Management of Engine Performance Restoration: Five Cases

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Introduction

An important source of income for an aircraft lessor is maintenance reserve payments or equivalent end-of-term return compensation for engine overhaul or performance restoration. This is particularly true if the lessor can preempt the performance of restoration shop visits and any associated replacement of life-limited parts before return. Maintenance reserves are monthly payments made by a lessee as specified in a lease, which constitute a sinking fund that builds toward the cost of a maintenance event. Typically, reserves are collected for airframe heavy checks, engine performance restoration or overhaul, replacement of engine life-limited parts, auxiliary power unit overhaul, and landing gear overhaul. Maintenance reserve rates for the individual categories are calculated as the estimated cost of the applicable maintenance event divided by the total interval, in flight hours, flight cycles, APU cycles, or calendar time, between maintenance events under the manufacturer maintenance planning document or lessee's approved maintenance program.

The lease will provide that when a lessee performs a maintenance task in one of these categories, the lessor must make a payment to the lessee or its maintenance vendor corresponding to paid-in reserves for the relevant component. Reserves not paid out during the lease term may usually be retained by the lessor at the end of the lease term. The opposite side of the coin is return compensation, by which the lessee must make a payment to the lessor if the lessee returns an aircraft in worse status for an applicable component than required by the return conditions. Maintenance reserves are a significant source of cash income to the lessor, perhaps larger even than monthly rent. Engine reserves for performance restoration and replacement of life-limited parts are payable by the lessee in larger amounts than reserves for the other categories of maintenance events, because of the higher cost of performance restoration and life-limited parts replacement as compared to those other maintenance events. It is in the interest of the lessor to collect, and not have to expend, maintenance reserves, or to collect return compensation. However, the more reserves collected and retained, or the more return compensation paid, means that the aircraft is closer to a maintenance event. This means that the aircraft may have a lower market value or, if it goes on lease to another carrier, that the reserves will have to be spent on an upcoming maintenance event to ensure the aircraft complies with the delivery conditions required by the new lease. Particularly with older aircraft, maximizing the cash retained by the lessor is of more value than the diminution of the value of the aircraft. Therefore, the active management of the scope and timing of maintenance events for which reserves are collected is an important part of lease management.

There is negative arbitrage in the cost of aircraft maintenance. In the case of an engine, the cost of a performance restoration shop visit and associated replacement of life-limited parts will not be fully reflected in the increase in the market value of an engine once it comes out of the shop. In other words, the market value of an engine fresh out of a performance restoration may be less than the market value of that engine before the performance restoration plus the reserve balance plus any required lessee contribution. This discrepancy can become more attenuated after one

or two periodic performance restorations. Therefore, the owner of an engine that is intended to be sold off-lease, whether as a spare or as part of a whole aircraft, may do well to sell it before a performance restoration. The owner of an aircraft on-lease may do better to accept a reduction in purchase price for the engine performance restoration balance (which will be netted off the purchase price) than to pay any required lessor contribution out of pocket, pay out the reserves, and allow a performance restoration to proceed.

Airframe structural checks cannot be avoided if an airframe will continue to be operated. By contrast, engine maintenance events can be managed because engines can be swapped among airframes and spares. The same is true to some extent for overhaul of landing gear and auxiliary power unit. However, the latter tasks are fairly inexpensive maintenance events compared to engine performance restoration, overhaul and replacement of life-limited parts. The ability to swap engines means that the leasing of an engine either as a spare or part of an aircraft can be thought of as a "lift solution" rather than a dry lease of a defined engine.

Case 1: Feeding Green Time Engines to Lessee

For a lessor with a fleet of (or ability to acquire) low-time nearly run-out engines of a single make and model, leasing an aircraft with a series of engines may be an effective strategy. The lease would provide that the aircraft initially consists of an airframe and engines with specific manufacturer's serial numbers. But the lease also could provide that once the lessee burns off an engine's green time — i.e., until a required performance restoration or expiration of life on any life-limited part — the lessee may redeliver the run-out engine to the lessor. The engine would be required to be serviceable and airworthy but for the expiration of the green time. At that time, the lessor would deliver another engine to the lessee, for continued leasing for the balance of the lease term (or until that replacement engine times out and is itself replaced by the lessor). The substitution procedure should be carefully drafted to accomplish two goals: for the airline, to minimize or eliminate the time that the airframe cannot be operated in scheduled service because one installed engine is run out; and for the lessor, to ensure that there is little or no time that the airline has possession of one extra engine that belongs to the lessor. Once a run-out engine is returned to the lessor, the lessor could disassemble an older engine and sell off the life-limited components that still have life because their lives are longer than relevant performance restoration interval that triggered the required maintenance event. Alternately the lessor could do a performance restoration on a newer engine and swap out the life-limiting parts and any other life-limited parts that would cause the engine not to stay on wing for the upcoming full performance restoration interval. The only limit on the use of this strategy is availability of substitute engines and parts.

Case 2: Short Term Lease Coupled With Early Engine Redelivery

A lease of an aircraft may have a term that is scheduled to end before the next scheduled shop visit for either engine. That does not ensure that the engine will not require an earlier, or unscheduled, shop visit. An engine may suffer an event that renders the engine unserviceable and requires a shop visit to return the engine to serviceability. The lease would not require that the airline pay the portion of the cost of the shop visit attributable to the utilization of the engine by a prior operator before the commencement of the term of the lease. If the engine did undergo the required unscheduled shop visit, the "lessor contribution" required to be paid by the lessor reflecting the utilization of the engine before the beginning of the lease term could be prohibitive. Furthermore, the lessor may not have additional green-time engines to feed to the lessee in exchange for the unserviceable engine. Even with a lessor contribution, removing an engine for a shop visit may not be an not an adequate solution for the airline because it will have an aircraft on ground for the duration of the shop visit unless it has a ready spare or can lease on in another spare engine. In such an event, the lease could provide that the lessee may immediately redeliver the aircraft with the unserviceable engine, in which case the leasing of the aircraft would terminate without any further obligation on the lessee. Alternately, the lease could provide that the lessee will redeliver the unserviceable engine only, retain the airframe and other engine on lease, and pay pro-rated rent for the balance of the lease term. Having to redeliver an aircraft or engine leaves the airline with less lift to support its commercial service, but it at least releases the lessee from some or all of the obligation to pay rent and maintenance reserves. Unlike the case of an engine's becoming

unserviceable because of a scheduled performance restoration, the unserviceability event here is not scheduled (i.e., it is not anticipated). It is important for the lessor to determine the cause of the unserviceability, because the airline should have to perform or at least bear some or all of the cost of the shop visit if the cause can be attributed to the airline or an event not covered by the maintenance reserves.

Unserviceability, insofar as it would entitle the lessee to redeliver an engine, is a negotiated definition in the lease. It would normally include any condition that renders an engine or module thereof (1) ineligible to receive a serviceability tag (such as an EASA Form One or FAA 8130); (2) in need of off-wing repair; (3) beyond serviceable limits; or (4) serviceable only if repeat inspections of the engine (or module) are or are required to be performed every 50 or fewer flight hours or every 14 days or less based on the airline's prevailing operation, whichever is more limiting. The causes of that unserviceability that may fairly be attributable to the lessee could include: (1) foreign object ingestion; (2) an accident (as defined by ICAO Annex 13); (3) an act or omission of the lessee or its employees or agents that constitutes gross negligence or willful misconduct; and (4) any failure to perform (whether or not intentional) in accordance with FAA or EASA approved documentation or manufacturer recommendations (including, but not limited to, storage, handling, shipment, inspection, installation, line maintenance, testing and flight operations). After the lessee redelivers the aircraft with the unserviceable engine or returns just that unserviceable engine, the lessor may elect to send the engine to the engine maintenance manufacturer or another engine maintenance vendor, to do a table-top inspection (more invasive than a borescope) to determine the cause of the unserviceability and whether that cause is one of the ones that the lease provides is attributable to the lessee. If it is one of such causes, the lessee will have to repair the engine lessee's expense or pay compensation to the lessor. This compensation will typically be either a fixed termination payment or the lesser of (1) the cost of the shop visit required to render the aircraft serviceable; and (2) the cost of a performance restoration pro-rated for the portion of the full performance restoration interval remaining when the unserviceability event occurred.

This risk allocation is similar to that of the lease of a used spare engine. If an engine with green time nevertheless becomes unserviceable during the term, the term would end and the lessee would redeliver the engine in compliance with the redelivery conditions except for the mechanical failure. The lessee would have no further obligation to the lessor unless the lessor determined that the unserviceability is attributable to one of the causes referred to in the preceding paragraph. In such case, the lessee would be required to repair the damage at its expense, pay for the repair, or make a termination payment to the lessor.

Case 3: Lease Extension Coupled With Option of Lessor to Substitute Engines

Often when a lessor and lessee agree to extend the term of an aircraft lease, and the aircraft is expected to come due for a performance restoration during the extension, the lessor will add an option of the lessor to substitute an engine during the extension in lieu of allowing the performance restoration to be performed. The lease would provide that before the engine comes due for its scheduled performance restoration, the lessee will notify the lessor. The lessor then would have a specified period to elect, if it wishes, to provide a replacement engine of the same make and model to lease to the lessee, at no additional cost to lessee, in exchange for redelivery of the engine coming due for the shop visit. Once the original engine is redelivered in return condition (i.e., complete and serviceable except for the need of the shop visit), and lessee pays any redelivery compensation for its utilization of the engine owed at redelivery, the leasing of the original engine ends. The replacement engine could be treated as a short-term spare (meaning it would not be sent for a shop visit by lessee). The lessee would get no abatement of rent but would not have to pay additional monthly rent for the spare engine. The lessee also would make maintenance reserve payments for the spare engine, in lieu of paying the reserves that were payable under the lease for the redelivered engine. The lessor would retain the engine reserve balance for the redelivered engine, and have no lessor contribution to pay. In return, the lessee could redeliver the replacement engine early itself if that requires a shop visit (subject to liability for the shop visit or alternate payment as described above if attributable to a lessee risk factor). Otherwise the replacement engine would be redelivered at the same time as the airframe and other engine.

Case 4: Keeping Engines Out of a Flight Hour Program

If an airline leased a used aircraft equipped with engines of the same type as other engines in the airline's fleet, and the airline has entered into a maintenance program for engines of that type with the engine manufacturer or another approved maintenance vendor, the airline would want to enroll the engines on the newly leased aircraft in the program as well. The maintenance program would provide that in exchange for a monthly payment similar in part to engine reserves, the airline receives a maintenance package that includes the next performance restoration shop visit and additional services such as provision of a spare engine to use on an airframe while an enrolled engine is in the shop.

Such a program is appealing to an airline. It allows the airline predictable payments in exchange for comprehensive maintenance services. It also allows the airline to take less perceived credit risk in making maintenance payments to the lessor in that it makes its payments to the engine manufacturer or other vendor who is offering the aftermarket service as compared to say a special purpose lessor in a structured financing. Commonality would be important to the airline. It would want to enroll all engines of the same make and model in its fleet in the same program. The lessor would want to accommodate the desire of the airline to enroll the lessor's engines in the maintenance program as well, in order to win the leasing mandate and otherwise keep its customer satisfied. However, there is a material cost to the lessor in permitting the airline to enroll those engines in the program. The lessor would immediately have to make a "buy in" contribution to the engine manufacturer or other vendor as a fee to enroll the engine in the maintenance program, reflecting the utilization of the engine since its last performance restoration shop visit before enrollment (or since new, if the engine has not undergone its first performance restoration). The lessor also would have to forgo being paid engine performance restoration maintenance reserves, because the lessee would instead make corresponding payments to the maintenance organization. If, before a covered performance restoration has been performed under the maintenance program, an engine is removed from the program, the lessor may be able to negotiate a credit toward the next performance restoration with the engine manufacturer or other approved vendor. But there would be limits on the right of the lessor to do so, including that the credit would not be for the full amount paid in by the lessor and lessee, or that the right could be exercised only if the lessee were in default under the lease and the lessor terminated the leasing of the engine. The larger problem, of course, is that a credit is not cash, as reserves are. Moreover, maintenance program agreements have to be read, understood and negotiated to the extent possible, which is a drag on transaction efficiency. Whether the lessor can succeed in requiring maintenance reserves and keeping an engine out of a flight-hour program may depend on whether the term of the lease is short enough to avoid the next scheduled shop visit.

Case 5: Redelivery Condition Letter of Credit

Lessors prefer to collect cash maintenance reserves every month. If a lease did not require that the lessee pay maintenance reserves, it would require that the lessee pay return compensation to account for the diminution of the status of the aircraft during the term of the lease. For the lessee, deferring the payment to the end of the lease term means the lessee can put what it would have spent for monthly reserves to other uses. For a lessor, however, replacing reserves with return compensation would present timing and credit issues. The lessor would not get to collect cash every month to put to an alternate use. It would have to wait to see if the lease went to term and then see if the lessee could meet what could a large payment obligation that is essentially monthly reserves back-loaded. If the lessee defaulted in the payment of rent, in or out of a formal insolvency proceeding, and the lessor repossessed the aircraft, the lessor would likely not collect the return compensation or collect only a small portion of it. To conserve cash and protect the lessor, the lessee could negotiate to avoid monthly maintenance reserves but secure the obligation to pay return compensation by providing the lessor an irrevocable standby letter of credit at the beginning of the lease term. The face amount required for the letter of credit would be reasonably related to the maximum return compensation calculated by the lessor at the beginning of the lease term. The issuing bank would typically be the lessee's local relationship bank. The letter of credit would then be confirmed by a major money center bank in New York or London. Managing a letter of credit would present certain challenges to the lessor, including (1) ensuring that a letter of credit with the typical one-year term were renewed by the issuing bank

in accordance with its terms or were automatically renewed; (2) ensuring that the letter of credit were transferable (or could be reissued) to a purchaser of the aircraft subject to the lease; (3) monitoring the creditworthiness of the issuing bank and enforcing an obligation in the lease for the lessee to have the letter of credit reissued by a different bank if any negotiated credit downgrade trigger were struck; (4) ensuring that the failure of the lessee to satisfy the letter of credit renewal and replacement requirements had matching lease events of default; and (5) satisfying letter of credit drawing formalities set by the issuing or confirming bank. So again, the payment of cash reserves is preferable to the lessor but return compensation secured by a letter of credit may have to be accommodated.

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