

A large jet engine is shown from a low angle, looking up. The engine's fan blades are visible, and a semi-transparent world map is overlaid on the engine's casing. The map shows the continents and is centered on the Atlantic Ocean. The text "The Global MRO Challenge" is written in white, sans-serif font across the middle of the map.

# The Global MRO Challenge

Globally, every carrier's approach to maintenance, repair and overhaul has a major profitability impact. Successful MRO strategies run the gamut from total outsourcing to developing in-house MRO expertise, then adapting and marketing that expertise as an outsourcing profit center — providing MRO service on other carriers' airframes and components.

■ By Allan Bachan | *Ascend* Contributor



The segment of the global airline industry involving maintenance, repair and overhaul is ever so important, and there are diverse coping mechanisms employed today.

MRO of aircraft, including the airframe and aircraft components, is quite an expensive business. Depending on aircraft age, type and the maintenance program being applied, costs can range from US\$300 to US\$1,800 per flight hour.

Additionally, it is estimated that there is a supply-chain inventory of US\$44 billion to support the global commercial airline fleet of 17,000 aircraft. Aerostrategy estimates that the annual global commercial aviation market amounts to a total of more than US\$40 billion today.

Any individual airline — anywhere in the world — averages between 12 percent and 15 percent of its total annual expenditures on MRO. For U.S. airlines, these figures mean that MRO represents the third-highest expenditure after fuel (approximately 26 percent) and labor (approximately 23 percent).

Maintenance items are typically packaged into four “letter” checks:

- “A” check is generally due every 30 days — or between 300 and 600 hours of flying. The “A” check can normally be performed on an overnight visit or within a 12-hour ground-time slot. “A” checks are often segmented, and completion of all segments usually culminates in a “C” check becoming due.
- “B” check happens about every six to eight months and is an inspection check that fits between “A” and “C” checks. The “B” check usually satisfies requirements of the “A” check,

as well, and it is normally accomplished in one to two days.

- “C” check occurs approximately every 12 to 18 months — or between 3,600 and 6,000 flight hours. The “C” check is considered a “heavy” check and requires significant dismantling of the aircraft, which can take from four to 15 days to complete. “C” checks typically take place in a maintenance hangar, or they are performed by an MRO supplier.
- “D” check is generally due every six to seven years — or 15,000 to 18,000 flight hours — and downtime ranges from 10 to 30 days, or occasionally even more.

Different carriers apply many different approaches to these letter checks. Some carriers may have four segments of C checks and 12 A checks. Other carriers can have 12 C checks and six A checks. The type of aircraft and which frequency of tasks is packaged into these checks will determine what is included, how often and how many segments.

Possibilities from among which to choose for MRO are broad and varied: A carrier can perform all of its own MRO, or it can outsource all of it. Probably most common, however, is the carrier that applies a combination of performing portions of its own MRO, and also selectively outsources certain MRO functions that make better economic sense being completed by an external party.

Of course, any outsourced MRO provider must be carefully monitored, since the ultimate responsibility for satisfying frequency requirements as well as overall accuracy of work performed and aircraft safety lies with the airline itself.

Nonetheless, in an era of critical airline cost reduction whenever and wherever possible, outsourcing MRO can bring huge benefits not only in cost savings, but in MRO performance by suppliers with more expertise and reliable experience than usually can be economically provided by any individual carrier on its own account.

MRO providers can be specialist suppliers or — more and more commonly today — competitor airlines, which are able to turn their MRO shops into substantive profit centers by actively seeking maintenance contracts with other airlines.

A carrier may choose to develop and maintain MRO capability only up to a particular level, and outsource all other MRO work.

Younger carriers, for example, might only have capabilities to manage the A check, the most basic checks of airframe and equipment.

On the other hand, mature carriers can often develop capabilities to perform more-complex maintenance such as nondestructive testing, borescopes and landing-gear changes, with the incentive being to considerably reduce the cost of these notoriously expensive tasks (especially when done in the field rather than at an MRO center). So, for the mature carrier, the potential cost savings are well worth the investment.

Within the global airline industry, more than 70 percent of components maintenance is outsourced. For most carriers, investment in capabilities and facilities to handle components maintenance is not economically justifiable.

But there must also always be sufficient spares to be able to sustain continued operations when unserviceable units enter the repair cycle. So a lot of newer carriers either contract for total support with the original equipment manufacturer or with approved overhaul suppliers. This approach of total care and service packages is an emerging trend.

Other carriers may specialize in one or two MRO areas and exchange MRO services with another supplier or operator for additional types of service. For instance, one carrier may service another’s wide-body aircraft in exchange for narrow-body service. Or carriers may offer each other Boeing repairs in exchange for Airbus repairs.

Similarly, radio components may be serviced by one operator, and instruments may be serviced by another. Such synergies can be very cost-effective, helping keep a carrier’s maintenance skill sets focused and investment in facilities low.

Wheels, brakes, batteries and headsets are often the first classes of components a newer carrier gains expertise in servicing, as these are generally high-turnover, high-consumption components, and they must always be available.

In both the components- and airframe-repair businesses, carriers should strive to “lock in” labor rates and fixed-cost agreements around agreed-upon turn times with suppliers, thus making associated costs much more predictable.



Photo courtesy of American Airlines

Applying the right blend of MRO services, whether in-house maintenance operations or outsourcing to external providers, varies from carrier to carrier, depending on what makes the most economic sense. Many low-cost airlines outsource the majority of their MRO needs, while some larger network carriers, such as American Airlines, run about 80 percent of their maintenance operations in house.



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**Aircraft maintenance, repair and overhaul is the third-highest expense for airlines; therefore, it's critical that each carrier determines the most cost-effective way to maintain planes, whether conducting the service in house, outsourcing all of it or, most commonly, a combination of the two.**

Of course, with any outsourcing agreement, there are risks because airlines have ultimate responsibility for the safety and airworthiness of their aircraft, and they must be diligent in overseeing the suppliers that provide such services.

Fortunately, however, the airline industry is strictly regulated and, as a result, published standards must be met by each and every MRO supplier. All MRO suppliers worldwide must meticulously follow quality-approved procedures. And regular, frequent audits ensure compliance.

There are approximately 4,200 U.S. Federal Aviation Administration-approved facilities in the United States alone and about 700 additional FAA-approved facilities in 70 other countries. Oversight of these repair stations is frequently delegated to local regulatory bodies, and that level of oversight is then audited by the FAA at least once a year.

Even carriers that are mature enough to do most of their own MRO work — and are also doing a thriving third-party MRO business — commonly outsource at least some MRO work to those they consider to offer greater advantages.

For example, FedEx and Southwest Airlines have never found it necessary to develop heavy-maintenance capability or the ability to perform extensive C and D checks that can require

a number of days and considerable aircraft disassembly and reassembly. Yet these are two of the most profitable airlines in the world, with extremely high reliability and safety records.

Other carriers, such as American Airlines, manage up to 80 percent of their own MRO operations large and small. These carriers — also, to one extent or another, including Northwest Airlines, Delta Air Lines and United Airlines — may run thriving MRO businesses themselves, but still outsource some 20 percent of their own needs.

American Airlines, long noted for its maintenance expertise, and Lufthansa are prime examples of carriers that perform extensive MRO for many of the world's airlines. Also globally renowned for its vast and sophisticated MRO capabilities is Singapore Airlines.

Regardless of the maintenance approach and practice by any particular airline, MRO represents a highly labor-intensive activity. The key in MRO operations is being able to use labor effectively to better control MRO-labor costs.

Quintessential assets of any maintenance organization are people skills, the “approvals-and-capability” list (that is, being approved to perform vital MRO functions) and first-rate facilities. Managing and maintaining these resources to the optimum degree is the best MRO-profit strategy any airline or maintenance specialist can adopt.

But, of course, there are many other MRO approaches that can also bear fruit in the cost-sensitive carrier's global context. Outsourcing in geographic regions with lower labor costs — but without sacrificing quality — is a strategy that many carriers strive to adopt, but not all can economically achieve.

Yet it's a developing phenomenon that the most economical, reliable outsourcing services of certain types are found in specific global regions, such as, in general, wide-body maintenance expertise in Asia, narrow-body maintenance in Latin America and engine maintenance in North America and Europe.

As carriers may approach their MRO challenges with open minds, they must also maintain a diligent, stringent commitment to demand the very best results. Only then can a carrier rest assured that its MRO is being performed to the utmost quality standards, but at the extremely elusive “lowest possible cost” in achieving that high-quality result. **F**

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