


[Click to Print](#)
[Close](#)

By Frank Jackman/Overhaul & Maintenance



Engine MRO costs are pushing upward world MRO spending, but unit costs continue to fall.

The \$41 billion worldwide market for the maintenance, repair and overhaul of commercially operated jet transports will expand at a compound annual growth rate (CAGR) of 4.8 percent over the next five years and then will taper off to 4.0 percent CAGR from 2012 to 2017, according to O&M's annual MRO Forecast. The increased MRO spend over the 10-year forecast period will be driven by fleet and utilization growth, solidifying labor rates in traditionally low-cost labor regions and continued significant increases in engine parts and overhaul costs. Increasing capacity, however, also will cause MRO unit costs to continue to decline, although not as steeply as in the past several years, according to TeamSAI and Ascend, the organizations that worked together to produce this year's forecast.

By 2012, the value of the MRO market for Western-built, commercially operated jet transports is expected to increase to \$51.8 billion, and then to \$62.9 billion by 2017. For purposes of the forecast, the market is divided into four sectors: heavy maintenance visits and modifications (HVM/mods); engine MRO; component MRO and line maintenance. Engine MRO represents, by far, the largest portion of the MRO market, accounting for \$17.1 billion, or roughly 42 percent, of the total spend this year. That proportion is expected to remain steady over the next decade. Spending on engine MRO is expected to increase at a rate of 4.5 percent to 4.7 percent a year over the life of the forecast, reaching \$21.6 billion in 2012 and \$26.9 billion in 2017.

According to TeamSAI Executive Vice President David A. Marcontell, the ever increasing cost of OEM-made spare parts is a primary driver of rising engine overhaul costs. "That is the reason why everybody has been anxiously awaiting the real impact of Pratt's PMA effort," Marcontell said in reference to Pratt & Whitney's plan to manufacture high value, gas path and life-limited replacement parts for the CFM56-3. "What will really be interesting to see is whether the airlines will adopt them, whether they will use them with any great degree of application. If they do, that is going to have a fairly substantial impact on holding down" the growth rate of material price, he said. Pratt & Whitney plans to deliver the first gas path parts this year and the first life-limited parts in 2008 in a deal with United.

A contributing factor to the rise in engine MRO spending is that new technology engines, which utilize new and expensive alloys and coatings because they burn hotter, are more costly to maintain. But, as Christopher Doan, TeamSAI's president and chief executive officer, pointed out, the new engines stay on wing longer and are more fuel efficient so, despite the increased cost of maintenance, can have an overall positive impact on the cost of operations. "While costs are going up for the newer engines, the overall operating economy contributed to the airplane is positive," he said, "so there is an offset with the fuel side of the equation."

Airframe HVM/mods account for roughly \$8.6 billion, or 21 percent, of the overall MRO market value. HVM spending is expected to grow at a compound annual rate of 4.7 percent through the next five years, and then to drop down to 3.6 percent CAGR for the second half of the forecast period as newer, less maintenance intensive aircraft are introduced into the worldwide fleet. Marcontell and Doan said the increased use of composites in newer aircraft is going to help keep airframe HVM costs down. "The technology we are seeing in airframes ... certainly is promising from the standpoint of reducing unit costs," said Doan, adding that new technology also will help keep component MRO costs in check.

Unlike with engine MRO, where the bulk of the cost is related to parts, more than two-thirds of the cost of an HVM is labor. Over the past few years, labor rates have been on the decline as financially troubled carriers have extracted concessions from their unions and increasingly outsourced labor-intensive airframe work to lower wage providers. But that situation is changing.

"We see that stopping and starting to move in the other direction as airline industry turns from red to black in terms of their financial performance," said Doan. "We are seeing a tremendous upward pressure on labor rates being charged in certain areas," he said. "Most notably, Europe is clearly pushing up into the \$70 to \$80 (an hour) range again. And, interestingly, China seems to be pushing upward in their rates... more in line with what the balance of Asia is seeing. Overall, I think we're going to see some leveling around the world in the next 10 years" as opposed to continued declines.

Doan and TeamSAI believe that the labor rate situation in China is being driven by increased demand for maintenance capacity and, to some extent, increased demand for qualified labor. "Not only does China have its own airplanes to maintain, but it has a lot of opportunity to maintain airplanes from other parts of the world. And as that (maintenance) capacity is tapped out, they have an opportunity to push (rates) upward," he said. If China-based MROs can demonstrate sufficient quality and turntime, they can take advantage of a tightening market and charge prevailing rates.

"The supply of licensed mechanics in both Europe and China is pretty tight," said Marcontell. "There have been a lot of

incidences of MROs poaching licensed mechanics from each other and the guys bouncing around taking the best deal." In addition, labor rates in Europe also are being influenced by the value of the Euro and operator preference to keep aircraft MRO within the region

The decline in labor rates has contributed to a steady decline in MRO unit costs - the cost of MRO per available seat mile (ASM). MRO unit costs were \$14.9 per 1,000 ASMs in 2001 and then spiked upward to \$15.9 per 1,000 ASMs as carriers scrambled to cut capacity in the wake of the economic downturn and Sept. 11. Since then, however MRO unit costs have fallen about 25 percent to \$11.9 per 1,000 ASMs this year. The steady improvement in the unit cost picture is the result of more efficient MRO practices and technology improvement, coupled with lower labor costs and increased capacity as airlines have rebounded operationally and traffic-wise from the depths of 2002 and have continued to focus on increased aircraft utilization.

Over the next 10 years, TeamSAI expects MRO unit costs to continue to decline, but at a more modest rate. By 2017, Marcontell and Doan expect unit costs to be down to \$10.8 per 1,000 ASMs, a decline of 9.2 percent from the current level. "There is no question that the bulk of the historical reduction in cost per ASM has been driven predominantly by a substantial lowering of maintenance costs," Marcontell said. "We are actually anticipating a fairly sizeable continued increase in ASMs per airplane, which is really what's driving it from this point forward as opposed to just the lowered MRO costs," he said. Capacity overall is expected to increase 5.8 percent per year over the next five years and then 5.1 percent annually over the second half of the forecast.

Essentially, aircraft are getting bigger and will be flying longer, which is driving ASM growth, according to TeamSAI and Ascend, a division of Airclaims, which provided the fleet data on which the MRO Forecast is based. In the 10-year forecast period, the average regional jet is going to increase from 55 seats to 72 seats; the average narrowbody from 137 seats to 144 seats; and the average widebody from 284 seats to 308 seats, according to the Ascend CASE database.

Aircraft utilization increased again last year, although a modest 0.5 percent, to an average annual rate of 3,450 flight hours from 3,433 flight hours in 2005, according to Ascend. "Low cost carriers have been in the forefront of the high utilization of narrowbodies, and some of the majors have had to follow to better compete," said Chris Seymour, head of market analysis for Ascend. Seymour added that he thinks "there's a bit more room to squeeze" increased utilization, subject to airport constraints.

Of course, a large part of the growing capacity picture is attributable to an increase in the sheer number of aircraft flying. The 2007 MRO market size projection is based on a fleet of 17,627 Western built jet transports being operated in commercial service (as opposed to a 737NG or A320 being operated in VIP service). Ascend said that the fleet will grow at a compound annual rate of about 4.5 percent over the life of the forecast, reaching 22,017 in five years and then 27,457 planes by 2017.

Narrowbodies comprise 61 percent of the current fleet with 10,770 aircraft. That share is expected to decline slightly to 60 percent in 2012 and dip again to 59 percent in 2017. Widebodies comprise about 23 percent of the current fleet and will maintain that share through 2012 and then increase slightly to 24 percent, or 6,504 aircraft in 2017. The regional jet share currently is 16 percent of the total, and that will increase to 17 percent in 2017 and remain at that level through 2017.

One aircraft type that definitely won't be seen in greater numbers as time progress is the 50-seat regional jet. "New build is effectively over" for 50-seat RJs, said Seymour. He said the exceptions are ERJ-145s that are being built in China under license from Embraer for operation in Chinese domestic markets. "The focus of the market is now 70-, 90-, 100-seaters," he said. "That is where the demand is."

Fleet growth overall is being driven by traffic growth and the need to replace aging aircraft. The latter point is particularly germane to the U.S. major carriers. "The big question in North America is the U.S. majors and when they start their major re-equipment" programs, Seymour said. "The fleet is aging now, especially on the narrowbody side. They're going to have to start placing major orders in the not too distant future."

A complicating factor, however, is that there are very few new aircraft delivery slots available in the next two to three years. Last year was the second strong year in a row for strong aircraft orders, and the backlog for new jets has risen to a record 5,500 units, according to Ascend. The previous record backlog was 4,498 aircraft in 2001. Interestingly, regional jets comprise 30 percent of the backlog in 2001, but only 10 percent of the current backlog, according to Ascend and TeamSAI. Given the strong backlog, U.S. majors likely won't be able to take delivery of significant numbers of new aircraft until the second half of the forecast period. According to Ascend statistics, 1,046 aircraft were delivered in 2006. This year's deliveries are expected to be close to 1,100, with the backlog for 2008 already at 1100, with 995 aircraft scheduled for delivery in 2009 and 773 in 2010, Ascend said.

Regional Development

From a regional perspective, North America, at \$15.6 billion, is the largest in terms of MRO spending, followed by Western Europe (\$10.4 billion), Asia-Pacific (\$5.6 billion), China (\$2.3 billion), the Middle East (\$2 billion), South America (\$2 billion), Africa (\$1.5 billion), Eastern Europe (\$1.2 billion) and India (\$444.1 million). North American is expected to remain the largest market for the 10-year life of the forecast.

The fastest growing region is India at 11.5 percent CAGR, but obviously the relative small size of the base plays a role in that. The only other region expected to show double-digit growth over the next 10 years is Eastern Europe, at 10.5 percent CAGR.

China and Asia-Pacific are forecast to grow at 6.8 percent and 6.4 percent annually, respectively, while Western Europe's CARG is 3.9 percent and North America's is 1.8 percent.

TeamSAI expects the trend of airlines outsourcing MRO work to continue. Currently, the consulting firm estimates that 53 percent HMV/mod work, 70 percent of engine MRO and 63 percent of component work is outsourced to third-party providers. Line maintenance is a different story, less than 17 percent outsourced, although there is a growing business in outsourced line maintenance.

About 80 percent of all outsourced work remains in the operator's region, according to TeamSAI research, while the other 20 percent is exported to other regions. The traditional rule of thumb has been that the larger an aircraft, the more will operator would be to have heavy airframe work done far from home. For instance, an operator of 777s is more likely to go abroad for a D check than an operator of narrowbodies. But generally speaking, most operators seem to be sensitive to keeping their aircraft reasonably close, Marcontell said.

The same is true for engines and components, particularly because lower cost labor has less of an impact on the overall cost of MRO than it does with airframes. If an operator ships an engine or component overseas for work, "you can end up spending a large amount of your total turntime just moving [the equipment] back and forth and that can offset your savings," said Marcontell. So why are engine and component shops springing up in China, India and the Asia-Pacific region? "Not because people are figuring out that they can do it cheaper, but because that is where the market is going to be," he said.

One area that would seem primed for importing airframe MRO work from other regions is Latin America, where labor rates still are 25 percent below the North American market, TeamSAI said. Latin America, however, is capacity constrained, particularly when it comes to widebodies. Mexican and Central American facilities typically cater to narrowbody fleets. VEM in Brazil is probably the region's largest widebody facility and the company is actively trying to grow its business, as are the major Mexican carriers.

The Aeroman facility in El Salvador is a member of the Airbus MRO Network, Singapore Technologies Aerospace is launching a joint venture airframe facility in Panama, and a number of North American and European companies are setting up facilities in Mexico. Overall, however, the region has been pretty quiet in terms of addressing infrastructure needs. "The region is sitting [next to] the biggest market in the world and there does not seem to be the insight yet to start exploiting that and developing that to the degree one might expect," Doan said.

The McGraw-Hill Companies

Copyright ? 2009 Aviation Week, a division of The McGraw-Hill Companies.

All rights reserved. [Terms of Use](#) | [Privacy Policy](#)