

Mar 4th, 9:00 AM - 10:30 AM

Outsourcing Aircraft Maintenance and Related Safety Implications

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Olganathan, Rajee Ph.D.; Miller, Mark Ed.D.; and Mrusek, Bettina M. Ph.D., "Outsourcing Aircraft Maintenance and Related Safety Implications" (2020). *National Training Aircraft Symposium (NTAS)*. 58. <https://commons.erau.edu/ntas/2020/presentations/58>

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Managing Safety Risks in Airline Maintenance Outsourcing

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Managing Safety Risks in Airline Maintenance Outsourcing

- Global Aviation Outsourcing Market
- Related Risk Factors
- Resulting Safety Issues
- Regulatory Response and Tools for Improving Safety
- Conclusions and Recommendations



Global Aviation Outsourcing Market

- Evolution
- Market Growth
- Global Nature of the Industry
- Recent Developments

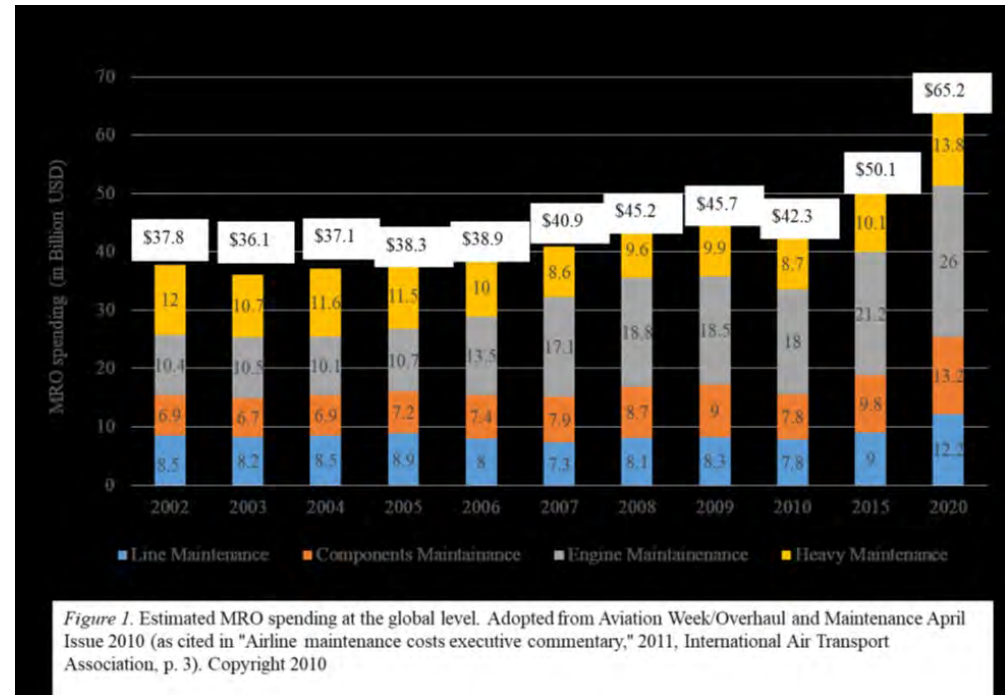


Evolution of the Global Aviation Outsourcing Market

- Gradual shift towards outsourcing (Airline Deregulation Act of 1978 and the introduction of non-stop international routes)
- MRO's enter the market; outsourcing phase maintenance which would be costly to perform in house due to labs or unions could now be outsourced to cheaper, non-unionized labor in foreign countries.
- Maintenance is necessary and highly regulated, both in the US and abroad (FAA/EASA), further supporting the MRO/outsourcing component to maintenance.
- Impact of 9/11; outsourcing grew from 37% in 1996 to 64% in 2009; resulted with safety concerns.

Market Growth

- Outsourcing of airframe maintenance nearly doubled between 2003 and 2007
- By 2020, the world MRO spending is projected to increase to \$65 billion, which is roughly double compared to the spending of 2003.
- Market is forecasted to increase at a rate of 3.5% by 2023, totaling more than \$91.9 billion.
- By 2028 it is expected to increase by four percent annually, accounting for nearly \$114.7 billion.



Global Nature of the Industry

- US, China, Western Europe, Asia-Pacific
- Though China is the primary contributor in Asia, limitations due to infrastructure, capacity and increasing cost of labor may force Chinese air carriers to send their fleet to southern and eastern regions to ensure maintenance work is completed on time.
- Currently, 24% of heavy airframe maintenance work of wide-body fleets are outsourced to China, but due to the projected growth of the region, the Asia MRO market cannot meet its own demand along with the outsourced work. Such opportunities could be shifted to America and Europe.

Related Risk Factors

- Complexity of MRO Organizations
- Location and Technological Challenges
- Advisory Organizations
- Unapproved Parts



Complexity of MRO Organizations

MRO organizations are incredible complex; efficient operations require substantial expertise and risk.



Location and Technological Challenges

- **Remote locations and unreliable internet:** Some foreign MRO's are located in remote locations (which can limit regulatory oversight) and have limited internet access.
- **Cyber-security risks:** Cyber risk poses a serious threat to safety, especially in the electronic documentation and transmission of reports and personnel records. This can make it difficult to ensure regulatory compliance (absence of clear paper trail).

Advisory Organizations

- The International Civil Aviation Organization (ICAO) is an advisory body that encourages and advises MROs about lack of consistent standards, but it does not have the authority to enforce it.
- Federal Aviation Administration (FAA) - Aviation maintenance organizations within the US have quality insurance programs. These quality programs create a system of safety checks and balances within the maintenance organization to ensure safety. Maintenance organizations outside the US lack these quality programs and as a result, it is difficult to maintain the quality of work.



ICAO



**Federal Aviation
Administration**

Unapproved Parts

Another area of concern is the suspected unapproved parts used by MRO's.

Difficult to monitor globally, SMS programs can mitigate this risk.



Accidents

- 1995: ValuJet DC 9 (Flight 597) flight from Atlanta, Georgia to Miami, Florida.
- 2009: In a China Airlines flight, a Boeing 737, on a scheduled flight from Taiwan to Japan landed in the Okinawa airport.
- In 2010, a Boeing 747, an Air France aircraft, went through a major maintenance inspection at a facility in China. It was later grounded when it was found that the exterior of the aircraft was refinished with flammable paint (Steele, 2015).



Regulatory Response and Tools for Improving Safety

- Regulatory Oversight
- Role of Airlines and Manufacturers
- Discrepancies



Regulatory Oversight

- FAA regulations, treaties and agreements
- Role of the Airlines
- Role of Manufacturers



Discrepancies

Errors Still Occur, Even in Safe Airlines

- Office of Inspector General received a complaint against American Airlines (AA), one of the largest and safest air carriers, that included 10 maintenance-related charges.
- The complaint questioned the effectiveness of FAA's oversight over the air carrier's maintenance program.
- Due to the seriousness of the complaint, OIG conducted an audit (June 2008 – December 2009).
- The NTSB found that AA's CASS (Continuing Analysis and Surveillance System) system was not effective, and that it failed to detect the repeated maintenance discrepancies.
- The FAA did not perform the routine surveillance of AA's CASS and reliability programs. The OIG audit also confirmed that AA did not implement Boeing's service bulletin.

Conclusions and Recommendations

- Global Partnerships
- Technological Advancements
- Regulations
- Data Collection and Analysis
- Mandate SMS Programs – emphasis on human factors





QUESTIONS?