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Development of Roadmap for the Aircraft Maintenance Industry, Maintenance Repair and Overhaul in Indonesia

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Abstract
Based on data from IAMSA in 2019, prior to the COVID-19 pandemic, the volume of aircraft maintenance spending from airlines in Indonesia was around US$ 1.2 billion. Of the spending volume, only about 35% can be absorbed by Maintenance Repair and Overhaul (MRO) Indonesia. MRO Indonesia has targeted in the next 5 years it can absorb around 70% of aircraft maintenance expenditures in Indonesia. The purpose of this paper is to build a roadmap for the aircraft maintenance industry in Indonesia. A road map is a guide that is used as directions/navigation to reach the desired target. The development of a roadmap for the aircraft maintenance industry in Indonesia is carried out by taking into account the current condition of Indonesia's MRO and future Indonesia's MRO targets in absorbing aircraft maintenance spending in terms of the 4 main pillars of the MRO industry, namely quality, human resources, infrastructure and supply chain. In terms of quality, it is necessary to increase the level of Indonesian MRO certification to the level of international standards (AS 9110, EASA, FAA). In terms of human resources, it is necessary to increase the number of licensed technicians by collaborating between MRO and vocational education institutions. In terms of infrastructure and supply chain, it is necessary to build hangars and workshops that have an integrated aircraft maintenance center facility 'one stop solution'/aerospace park. The strengthening of the four pillars is carried out gradually and continuously a priority to form a roadmap for the aircraft maintenance industry in Indonesia.

Keywords: roadmap, MRO, international standards, aerospace park

1. Introduction

According to data from the Indonesia Aircraft Maintenance Service Association (IAMSA) as shown in Figure 1.1 below, it can be seen that until the end of 2019 before the Covid-19 pandemic, the total MRO (Maintenance Repair and Overhaul) domestic market was US$ 1.2 Billion and will grow around 15% per year to around US$ 2.5 Billion in 2024. Of the total aircraft maintenance spending by these airlines in 2019, only 35% was absorbed by domestic MRO and another 65% was absorbed by foreign MRO. This is a very interesting value to be targeted by MRO Indonesia to take up a larger portion, which is around 70% (twice the current absorption) of the aircraft maintenance market for domestic airlines in the next 5 years.

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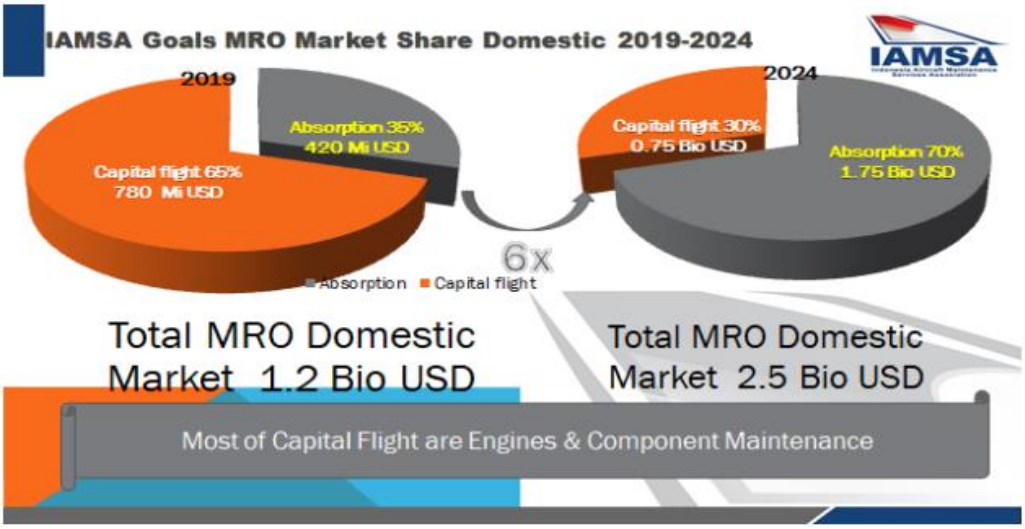

Figure 1. MRO Market Share Domestic & Goal 2019-2024

1.2. Problem Formulation

Several things have become problems for Indonesia's MRO in achieving the 70% absorption target of aircraft maintenance expenditures for domestic airlines, related to the 4 pillars of MRO development as shown in Figure 1.2 as follow:

1. Standardization of Quality: Indonesia's MRO quality level standards need to improve
2. Personnel: the number of technicians and engineers is still lacking
3. Capability & Capacity: capability and capacity is still lacking.
4. Supply Chain Material: supply chain material is still inefficient.

Figure 2. Four Pillars of MRO Development

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1.3. Objective

The purpose of this paper is to develop a roadmap for Indonesia's MRO in order to achieve the target of absorption around 70% of the Indonesian airline aircraft maintenance market so that Indonesian MRO can be the host in our own country.

2. Discussion

In pursuing the target of absorption 70% of aircraft maintenance expenditures, for this purpose an analysis of the causes of the small absorption of aircraft maintenance expenditures is carried out in terms of the 4 pillars of MRO development, namely MRO quality level, personnel, capability & capacity and supply chain materials and after that it is carried out making and elaborating the MRO Indonesia roadmap.

2.1 Quality Standard

From around 76 MROs in Indonesia, according to data from the Ministry of Transportation portal, only a few MROs have FAA and/or EASA certificates, namely GMF AA, Batam Aero Technic, Muladatu, Wira Jasa Angkasa and FL Technic. Meanwhile, there are still aircraft leasing companies that require that maintenance of their aircraft and aircraft components must be carried out at an MRO that has an FAA/EASA certificate. There needs to be a partnership between MROs that have FAA/EASA certificates and other MROs that have adequate facilities and experts to become MRO satellites with international standards. In addition, Indonesian MRO should also have the AS 9110 standard.

2.2 Personnel Development

According to data on the need for certified technicians from IAMSA as shown in chart 2.1 below, one of the issues faced by the Indonesian MRO industry for the next few years is the shortage of skilled personnel in the field of aircraft maintenance. From chart 2.1, Indonesia needs around 800-1000 aircraft maintenance experts per year. Meanwhile, until 2014 there were only 500-700 experts who could supply aircraft maintenance experts from STPI, Unnur, GMF AA and several educational institutions with AMTO certificates. There is still a shortage of around 300 aircraft maintenance experts per year.

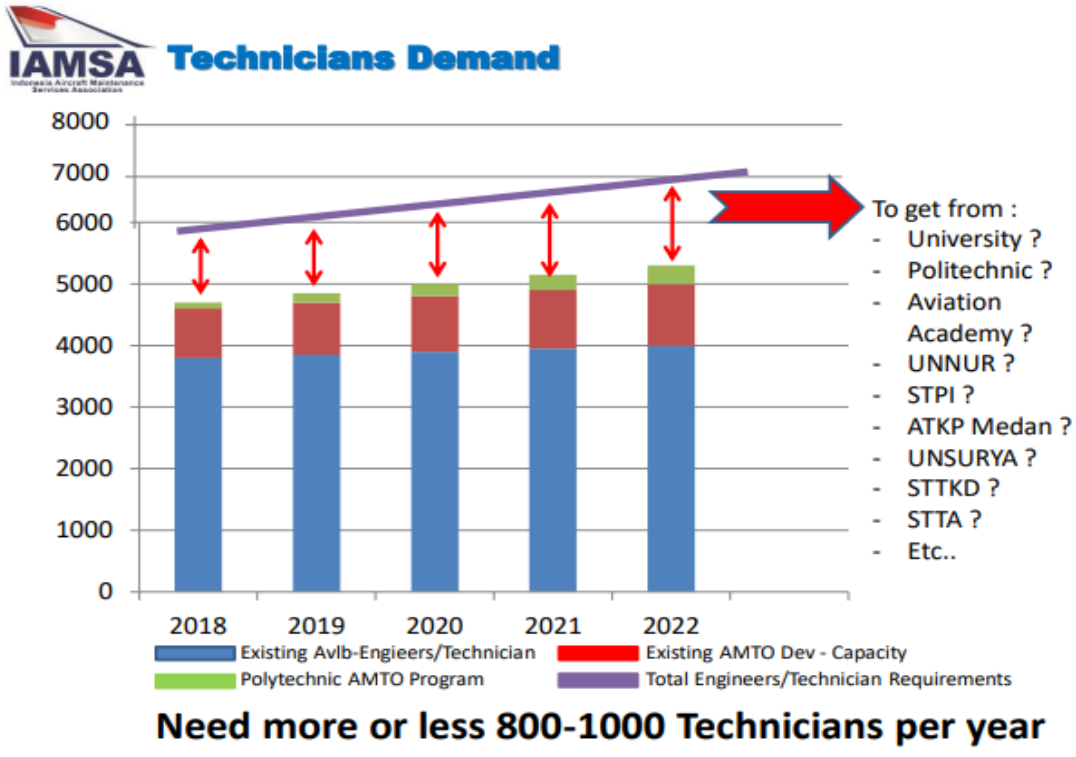

Figure 3. Chart Technicians Demand

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Since 2015, the supply of aircraft maintenance experts has not only been sourced from STPI Curug, GMF AeroAsia, Unnur and several certified AMTO educational institutions, there has also been collaboration between GMF AA, UNSURYA, STTA and several polytechnics in Indonesia. Until the end of 2019 the shortage of aircraft maintenance experts was still around 300 people per year, until finally the Covid-19 pandemic occurred which made the need for aircraft maintenance experts stagnated and decreased. However, the pattern of cooperation in aircraft maintenance expert education between GMF AA and several educational institutions such as UNSURYA and the Polytechnic which has adequate hangar and workshop facilities needs to be continued to anticipate the needs of the aviation industry after the Covid-19 pandemic. Furthermore, once ready, the educational institution assisted by GMF AA is expected to have its own AMTO certificate. Regulation should be simplified in order to get AMTO (Aircraft Maintenance Training Organization) certificate.

2.3 Capability and Capacity Development

From the IAMSA data in Figure 1.1 it is stated that the most unabsorbed aircraft maintenance work is the maintenance of engines and components, both mechanical and electrical. For this reason, it is necessary to develop capabilities and capacities for engine and component maintenance at the existing MRO. The development is carried out for engines and components that have a large population and are fast moving. Such as the development of capability and engine capacity for B737-800 (CFM56-7B) and A320 (CFM56-5B) aircraft. For the development of aircraft component capability and capacity, it can be taken from the top 10 fast moving components from the reliability report data of flight operators. The development of aircraft engine and component maintenance capability and capacity must be supported by government policies in favor of MRO Indonesia to obtain an efficient and effective material supply chain like in neighboring countries. The construction of hangars for aircraft airframe maintenance capability and capacity development needs to be carried out at the existing MRO around the airport if there is available area for expansion, alternately hangar construction in a new area where there is no hangar yet for aircraft maintenance near the airport. Which is a very important one for aircraft maintenance hangars near the airport is that the concession fee charged to the MRO by Angkasa Pura 1 or Angkasa Pura 2 must be very small because the MRO profit margin is small.

2.4 Supply Chain Material

The efficiency of the aircraft material supply chain is very important in the development of MRO in Indonesia. With an efficient and effective material supply chain, MRO and investors will be interested in developing MRO in Indonesia. Things that need to be done to streamline the supply chain of aircraft materials are as follow:

2.4.1 Regulation Simplification

- The government needs to simplify regulations in the national MRO industry, such as:
- Tax Regulations: exemption of value added tax for all aircraft spare parts
- Customs: exemption from import duty rates for aircraft spare parts, accelerated custom clearance process, abolished the red line for aircraft spare parts
- Immigration: ease of regulation regarding residence permits and visas for Technical Representatives of flight operators who send their aircraft to MRO Indonesia during their maintenance period
- Rent of State Land for the aviation industry, which has so far been very high rent, must be granted relief with a very low "Land Fair Value".

2.4.2 Bureaucratic Simplification

- The bureaucracy in the government needs to simplify the national MRO industry, such as:
- Implementation of E-Government (electronic-based government system / SPBE) must be more optimal because there are still many obstacles in the implementation process
- Simplified AMO (Approved Maintenance Organization) renewal process
- Accelerate the time of releasing goods at Customs/customs clearance
- Simplification of the AMTO (Aircraft Maintenance Training Organization) certification process.

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2.4.3 Integrated Infrastructure Development

Integrated infrastructure development or commonly called aerospace park is an integrated area where all aircraft maintenance activities are located, including: MRO companies, manufacturers, vendors, logistics and warehousing centers, workshops for components and engines, training centers and flying schools. This aerospace park model has been developed by several countries in the region and ASEAN. In the Asian region, South Korea has started to develop Cheongju International Airport to become an Aerospace-park since 2011 and India has developed the GMR Aerospace Park in Hyderabad since 2008.

Meanwhile, Singapore has developed the Seletar Aerospace-park since 2007, Malaysia has developed MIAC (Malaysia International Aerospace Center) in Subang since 2007, Thailand at Dong Mueang Airport, the Philippines at Clark Airport, and finally Vietnam in Da Nang City which began developing Aerospace Park since 2014. However, Indonesia with the rapid growth of air transportation and high aircraft maintenance market opportunities have not yet chosen a location to be an Aerospace Park. The existence of the aerospace park, can provide the following benefits:

a. Improve Aircraft Safety and Reliability. With the Aerospace Park, it will make much easier and faster for MRO Indonesia to get the spare parts needed.
b. Cheaper Aircraft Maintenance Costs. There are no additional costs for the procurement of spare parts or convenience in supply chain management so that aircraft operators can sell cheaper airline tickets, aircraft can operate longer, aircraft operator income will be more and at the end the taxes given to the government will also increase.
c. Foreign exchange savings. Less aircraft maintenance works is shipped overseas.
d. Open new jobs. Projecting the addition of new jobs in every additional workforce in the aircraft maintenance industry in Indonesia.
e. Bring in foreign exchange. The presence of manufacturers, suppliers and increasing domestic MRO capabilities so that it will attract foreign airlines to maintain their aircraft in Indonesia, and at the end 65-70% of the market that initially went abroad can be absorbed domestically and increase the country's income.

Based on the results of studies and discussions between IAMSA and stakeholders, Indonesia needs Aerospace Park areas in Batam & Kertajati (west area), Semarang & Makassar (middle area), Timika & Sentani (east area).

From the discussion of the 4 pillars of MRO development problems above, a roadmap for Indonesia's MRO is then made as shown in Figure 2.1 below, as a guide for planning activities that must be carried out in the next 5 years so that the absorption of Indonesian aircraft maintenance spending can reach around 70%. The existing MROs are still maintained, especially MRO that already have PLB (Bonded Logistics Center) and KEK (Special Economic Zones) areas such as GMF AA, FLT and BAT. Other MROs can conduct strategic partnerships to participate in the aerospace park consortium with other stakeholders.

Figure 4. Roadmap of Indonesia's MRO

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3. Conclusion

From the MRO Indonesia roadmap which was built from the results of the analysis of the 4 pillars of MRO, the following conclusions can be taken that several things that must be improved that have a high impact on implementation in the MRO Indonesia roadmap so that the absorption capacity of national aircraft maintenance spending can reach 70% are: the concession fee imposed by AP I and AP II must be much smaller, the material supply chain must be very efficient and effective, and the development of an aerospace park by conducting a strategic partnership must be done as ultimate step. Several other things that need to be improved that have a moderate implementation impact are: developing collaboration between educational institutions to meet the needs of certified technicians, improving MRO quality standards, developing MRO capability and capacity for engine maintenance (especially CFM56-7B and CFM56-5B) and fast-moving aircraft components, building MRO infrastructure at several airports in the west, central and east regions. In addition, it is also necessary to increase the involvement of stakeholders such as the Ministry of Industry, Ministry of Transportation, Ministry of Finance, Ministry of Trade and associations.

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