

THE CHALLENGES AND OPPORTUNITIES OF MAINTENANCE, REPAIR AND OVERHAUL (MRO) IN KERTAJATI INTERNATIONAL AIRPORT (2021)

**Alifea Nabilah Shali¹, Alifia Nur Almadita², Salahudin Rafi³, Alit
Sodikin⁴**

1, 2, 3, 4, Trisakti Institute of Transportation and Logistics Jakarta

✉ Corresponding author: alifea3213@gmail.com

Abstract: Maintenance, Repair, and Overhaul (MRO) is one necessary thing to ensure safety and airworthiness of all aircraft by international standards related to service quality in aviation. It was needed along with the development of aviation in Indonesia as it is growing quite high at around 9.2% per year up to 2025. One of the airports in West Java namely Kertajati International Airport is developing MRO business in Indonesia. The objective of this research is to identify the Strengths, Weaknesses, Opportunities, and Threats or known as SWOT analysis to determine what can help the MRO business at Kertajati International Airport in achieving its goals as well as the obstacles that must be overcome or minimized to get the results according to the masterplan in order to make the MRO development runs smoothly and to obtain large profits for entry point of national and regional economic recovery of West Java.

Keywords: MRO, Airport, Aviation, Masterplan, SWOT

Introduction

The aviation industry has a huge social and commercial role for society as it is one of the most regulated global industries that connects people, create new travelling to various places and as a worldwide transportation so that with the global economic growth that continues to grow, the demand for air transportation is expected to arise rapidly. Currently, Indonesia is one of the regions with the highest fleet growth (7.4%) among other countries (Adi, Eliyana, & Hamidah, 2021). Thus, it is undeniable that

the growth of fleet in the aircraft business will inevitably have an impact on the need for routine maintenance and periodic repairs by an aircraft maintenance organization known as Maintenance, Repair & Overhaul (MRO). By definition, MRO in the aviation industry is a complex process that has strict and precise requirements set by the airworthiness authorities to ensure the safety of passengers and crews (Vieira & Loures, 2016).

The MRO market in Indonesia is growing quite high at around 9.2% per year up to 2025, just second after India which has an MRO market growth rate of around 10% per year and above China with a growth rate of around 8.7% per year (Franciscus et al., 2016). Clearly, it is a lucrative business opportunity for the MRO business in Indonesia. Moreover, the MRO business in Indonesia has an advantage, especially in cost. The man-hours cost in Indonesia is half the cost of man-hours in Europe and other developed countries in Asia. Hence, it is a great opportunity to increase the competitiveness of Indonesian MRO industry.

Unfortunately, there are fewer MRO businesses in Indonesia compared to other countries. There are 6 MRO businesses in Indonesia that credible and quite credible and also with few locations, such as PT Garuda Maintenance Facility Aero Asia Tbk, Batam Aero Tech MRO Lion Air, PT Nusantara Turbin & Propulsi (NTP), PT Indopelita Aircraft Manufactured Services (IAS), PT Dirgantara Indonesia, and Merpati Maintenance Facilities (MMF). It is obvious they can't handle all the fleet services from the airlines, so the rest is still done aboard. Whereas the aircraft maintenance operation must be carried out domestically and be the host in our own country, because as mentioned before that the MRO business in Indonesia has a big opportunity not only for the domestic market but also for Asia Pacific market. In addition, the growth of the MRO industry also encourages the creation of high-tech jobs and creates a multiplier effect for supporting industries.

Bandara International Jawa Barat (BIJB) or known as Kertajati International Airport is one of the airports that is developing the MRO business in Indonesia. Kertajati International Airport is a regional owned enterprise or Badan Usaha Milik Daerah (BUMD) which is mandated through

the governor's decision and regional regulations to manage airports and Aero City. Kertajati International Airport has a land area of 1,800 Hectares for the airport and 3,480 Hectares for the Aero City. The shareholders are the West Java Provincial Government at 83.20%, West Java Cooperatives at 1.54%, Jasa Sarana (BUMD) at 0.64% and PT Angkasa Pura II at 14.62%. Kertajati International Airport has not been able to manage the airport itself because it does not have an airport business entity permission yet called Badan Usaha Bandar Udara (BUBU) certificate so that Kertajati International Airport agreed to carry out joint operations or Kerjasama Operasional (KSO) with PT Angkasa Pura II (Airport, 2020).

The government also encourages the use of Kertajati International Airport to carry out aircraft maintenance functions so that later Kertajati International Airport will not be used for passenger and cargo facilities only. Nevertheless, the minister of transportation has coordinated with the Tentara Nasional Indonesia (TNI) Commander and PT GMF AeroAsia (GMFI). Later on, government-owned aircraft from various agencies will conduct MRO at Kertajati International Airport. Even more, this MRO will not only be for the government but in the future, it will also be used for the MRO of private aircraft that have been carrying out maintenance abroad. Hence, the development of MRO in Kertajati International Airport will be carried out in a short time because of the vital functions in the aviation world. The MRO industry continuously has many opportunities and also challenges that need efforts to overcome so that the industry is able to survive, grow, and develop.

Besides the MRO business, Kertajati International Airport also plans to become an Aero City and develop a logistics center (Tjahjono & Yuliawati, 2017). From the data graph attached to the master plan shows statistics on the movement of aircraft, cargo, and passengers at Kertajati International Airport, which have almost the same pattern. In June 2018, when Kertajati International Airport started operating commercially, the movement of aircraft and passengers continued to move up and increased rapidly in July 2019. This was due to the distribution of the Kertajati International Airport (KJT) - Husein Sastranegara Airport (BDO) route. Then the movement

decreased slowly until January 2020 and finally dropped drastically until the last scheduled flight on April 3, 2021. This drastic decrease was caused by restrictions on aircraft and passenger movements as a result of the COVID-19 pandemic.

As for the movement of cargo, incoming and outgoing operations continued to increase from July-December 2019 and reached their peak in January 2020. Then, it decreased drastically from March 18 until now. Although, Kertajati International Airport is still trying to carry out the movement of cargo by making the airport as a logistics center and cooperating with Garuda Indonesia. The main objective of developing the non-passenger business mentioned before is to obtain large profits and serve as an entry point for the national and regional economic recovery of West Java.

Research Methods

The method used is descriptive qualitative analysis. The data collection was done through direct observation in the fields, interviews with informants, and literature studies (Saribanon, Purba, & ..., 2018). There are two types of data that will be used, primary and secondary data. The source of primary data is from the master plan document from Kertajati International Airport and interview with the President Director of PT Bandara Internasional Jawa Barat (BIJB). The source of secondary data is from survey, news, and several journals related to the research theme. The data collection techniques used are: (a) Observation, that is by observing the airport environmental development, particularly in the current MRO construction process, (b) Interviews, that is by asking several questions about the masterplan and its current progress to the President Director and airport staffs, last is (c) Documentation, that is by providing accurate information in the form of text and pictures.

Discussion and Result

The MRO business is expected to grow substantially in the coming years. As per estimates from aircraft manufacturers, the number of aircraft

will double in the next 20 years. The aircraft retirement age has been increasing year by year and has increased from 15 to 25 years now, which makes the MRO business predicted to be a promising business. In fact, in the midst of the ongoing COVID-19 pandemic, even though the airline fleets are not operating, they still need to carry out routine maintenance to keep them well-maintained. This prolong inspection is carried out on several aspects, such as engines, cabins, and aircraft systems with the aim of keeping the aircraft airworthy, in accordance with the aircraft manual of each fleet. So, when the aircraft is needed immediately to operate, passengers and crews can feel comfortable and safe.

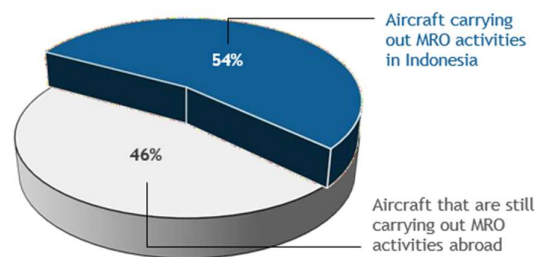


Figure 1. MRO usage comparison chart

Source: DKUPPU Kementerian Perhubungan

Based on figure 1, the data from DKUPPU of the Indonesia Ministry of Transportation, 46% of domestic airline aircraft still carry out MRO activities abroad. Since the Indonesian MRO market is projected to grow 9.2% per year, the development of Kertajati International Airport MRO will support the development of the national MRO industry so that national airlines can perform efficiently by performing aircraft maintenance in the country. Thus, in the ultimate stage, Kertajati International Airport MRO intends to equip the MRO capacity with 10 hangars with 16 slots for wide-body aircraft and 16 slots for narrow-body aircraft.

In general, according to the Federal Aviation Administration (FAA), aircraft maintenance is a facility that has at least 6 (six) services, namely aircraft maintenance hangar, warehousing, office space, apron area, auto

parking, and engine run-up area. Based on the layout of the aircraft in the hangar, there are 2 (two) types of aircraft slots arrangement, namely conventional and T-hangars. In the Kertajati International Airport master plan, the hangar and MRO have an allocation of 15 hectares of land. Currently, the land that has been acquired is 9.5 hectares. However, because there is an increase in capacity, it requires an area of 62 hectares. For this reason, it is proposed to move the location of the MRO facility to a more adequate location. Figure 2 below is an illustration of the layout plan of the MRO area at Kertajati International Airport.

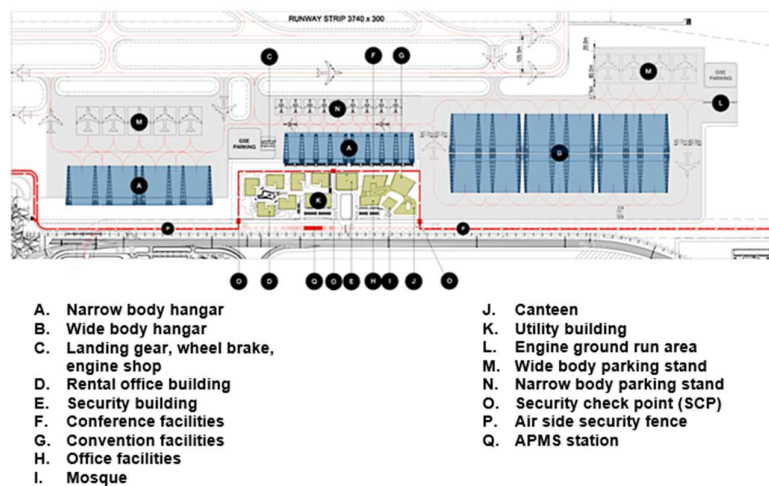


Figure 2. Layout of MRO Area at Kertajati International Airport

Source: Master plan of BIJB Kertajati

Therefore, in order that MRO business development at Kertajati International Airport runs smoothly and according to the plan, it is necessary to find out the Strengths, Weaknesses, Opportunities, and Threats or commonly known as SWOT analysis. A SWOT analysis evaluates the internal strengths and weaknesses, and the external opportunities and threats in an organization's environment (Sammut-Bonnici & Galea, 2015). Internal analysis is used to identify the current resources, capabilities, core competencies, and competitive advantages as strengths for Kertajati International Airport in building the MRO business as well to find out what

shortcomings they have that can hinder the success of the MRO business. While the external analysis identifies market opportunities and threats by looking at competitors' resources, industry environment, and the existing general environment.

To identify a SWOT analysis, the researcher reviewed the master plan document provided by Kertajati International Airport and conducted interviews with the President Director and airport staffs. All data collections were processed and resulted in the attachment of SWOT analysis as shown below in Figure 3. After completing a SWOT analysis that determines what can help the MRO business at Kertajati International Airport in achieving its goals as well as the obstacles that must be overcome or minimized to get the results according to the desired plan to make the MRO development runs smoothly and more organized.

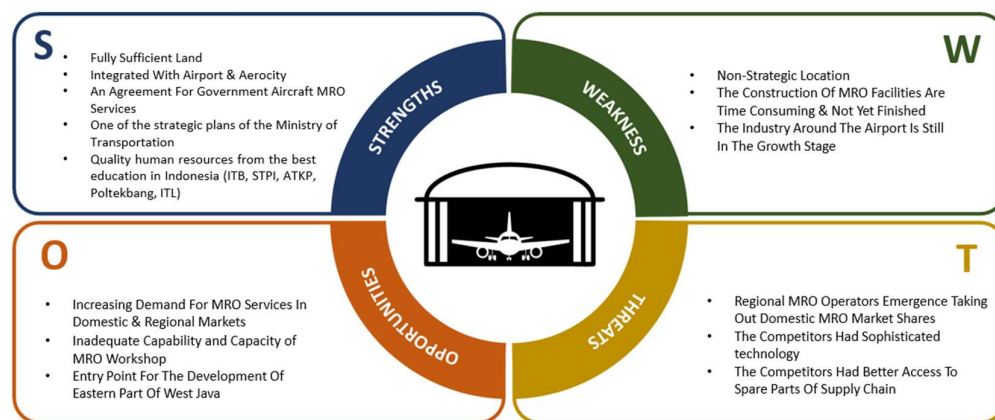


Figure 3. SWOT analysis of MRO at Kertajati International Airport

Conclusion

The growth of fleet in the aircraft business will inevitably have an impact on the need for routine maintenance and periodic repairs by an aircraft maintenance organization or known as Maintenance, Repair & Overhaul (MRO). MRO means repair, service, or inspection of an aircraft or aircraft component that the maintenance activities take place on the need for routine maintenance and periodic repairs to ensure safety along with airworthiness of all aircrafts by international standards. In terms of the MRO's market size, Indonesia is the largest spender for MRO services for commercial aircraft,

nevertheless MRO in Indonesia is still unable to accommodate a large number of aircraft from various airlines, so many aircraft in Indonesia are still carrying out their maintenance abroad. Kertajati International Airport (BIJB) is one of the airports that developing the MRO business in Indonesia. So as the development of MRO in Kertajati International Airport runs smoothly according to masterplan, it needs to find out the SWOT analysis to see the advantages and disadvantages Kertajati have in their MRO development.

References

- Adi, E. N., Eliyana, A., & Hamidah. (2021). An empirical analysis of safety behaviour: A study in MRO business in Indonesia. *Heliyon*, 7(2), e06122. <https://doi.org/10.1016/j.heliyon.2021.e06122>
- Airport, I. N. T. L. (2020). *Int'l airport & aerocity* ©.
- Azka, R. D., & Nurcahyo, R. (2018). Quality management strategy for Indonesian aircraft MRO companies based on Kano Model, QFD matrix, and AHP. *Proceedings of the International Conference on Industrial Engineering and Operations Management, 2018-March*, 1544–1555.
- Chaitiparsana, K., & Liangrokapart, J. (2020). *SPECIAL KNOWLEDGE AND SKILLS NEEDED FOR AVIATION MAINTENANCE , REPAIR AND OVERHAUL (MRO) INDUSTRY*.
- Dinis, D., Barbosa-Póvoa, A., & Teixeira, Â. P. (2019). A supporting framework for maintenance capacity planning and scheduling: Development and application in the aircraft MRO industry. *International Journal of Production Economics*, 218(February), 1–15. <https://doi.org/10.1016/j.ijpe.2019.04.029>
- Franciscus, F., Studi, P., Penerbangan, T., Kedirgantaraan, F. T., Dirgantara, U., Suryadarma, M., ... Perdanakusuma, H. (2016). Review Klaster Mro Di Indonesia Dan Strategi Pengembangannya. *Jurnal Teknologi Kedirgantaraan*, 4(2). <https://doi.org/10.35894/jtk.v4i2.314>
- Harapan Baru dari Pengembangan Bisnis Industri MRO. (n.d.). Retrieved

- July 4, 2021, from
<https://www.cnbcindonesia.com/market/20201002162804-19-191351/harapan-baru-dari-pengembangan-bisnis-industri-mro>
- Kamat, S. R., Md Hassan, F., Wan Mahmood, W. H., Ani, M. F., & Suliswiyadi. (2021). Critical Factors Influencing Project on Effective Maintenance, Repair and Overhaul (MRO) in Aircraft Aviation Industry. *Malaysian Journal on Composites Science and Manufacturing*, 4(1), 1–10. <https://doi.org/10.37934/mjcs.4.1.110>
- Lubis, B. U. (2015). THE AEROCITY : The Future of Indonesian Airport. *Architectural Research Group*, (November).
- Marcontell, D., Cooper, T., Martin, C. Ga., & Reagan, I. (2020). Impact of Covid-19 on Commercial MRO. *Journal of Chemical Information and Modeling*, 53(9), 1689–1699.
- PT. BIJB. (2015). *Tentang PT. BIJB*. 34. Retrieved from www.bijb.co.id/sejarah/
- Sammot-Bonnici, T., & Galea, D. (2015). SWOT Analysis. *Wiley Encyclopedia of Management*, 6(January 2015), 1–8. <https://doi.org/10.1002/9781118785317.weom120103>
- Saribanon, E., Purba, O., & ... (2018). Between Halal Logistics And Halal Policies. ... *in Transportation and ...*, 1007–1013.
- Seitz, M., Lucht, T., Keller, C., Ludwig, C., Strobelt, R., & Nyhuis, P. (2020). Improving MRO order processing by means of advanced technological diagnostics and data mining approaches. *Procedia Manufacturing*, 43, 688–695. <https://doi.org/10.1016/j.promfg.2020.02.121>
- Tjahjono, T., & Yuliawati, E. (2017). Bandar Udara Internasional Jawa Barat (BIJB) dan Potensi Kertajati Sebagai Aerocity. *Warta Ardhia*, 43(1), 43. <https://doi.org/10.25104/wa.v43i1.274.43-50>
- Vieira, D. R., & Loures, P. L. (2016). Maintenance , Repair and Overhaul (MRO) Fundamentals and Strategies: An Aeronautical Industry Overview. *International Journal of Computer Applications*, 135(12), 21–29.