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Indian MRO industry: Business retention and development opportunities pre COVID-19
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A B S T R A C T
This viewpoint focuses on increasing and retaining Indian MRO market within India by improving the maintenance standard through EASA approved maintenance organizations and by change in existing investment approach. An overview on MRO market demand and the market retention with respect to outsourced services during pre covid-19 is detailed. The existing standard of maintenance with respect to global standards was compared to identify the well-focused training need. Need of EASA framework implementation for maintenance training to improve existing training standard are detailed. Focus to improve leasing and investment approaches in MRO are discussed to retain and increase the MRO market. Effective business retention and focused growth to become a global MRO hub can be achieved by adopting EASA regulatory framework for maintenance training and MRO, supported by the developments in aircraft leasing sector. Addressing the EASA training need and leasing opportunities can be helpful in convincing authorities and market leaders to realize the potential of India to be a global MRO hub. This viewpoint can be thought provoking in retaining the Indian MRO market by addressing the need of EASA standardization in maintenance training with respect to improve the maintenance quality and to attract investment and leasing. Ways of increasing the MRO business through change in existing aircraft leasing approach and need of EASA framework in maintenance training and standardization are provided to convince authorities and market leaders to realize that India can become future global MRO hub.

1. Introduction

As Indian aviation market is expected to become third largest aviation market by 2022 it should prepare itself to handle 1,124 million passengers in 2040 whereas it had 187 million passengers in 2018 [17]. Indian domestic passenger growth increased to 144 million in the FY 2019 whereas it was 138 million during FY 2018 [8]. For 94% increase in 20 years India should concentrate in multi-dimensional development of its aviation market [17].

The first National Civil Aviation Policy of Indian Ministry of Civil Aviation came into act in 2016. The skills needed for Indian maintenance, repair and overhaul sectors were addressed by this policy and about disadvantages that are existing in the Industry Institution framework were discussed. DGCA is an Indian Civil Aviation Authority which governs the safety aspects of civil aviation in India. For effective aviation safety oversight administrative and financial autonomy can be given to DGCA. Around $723 Billion USDs were spent on MRO business and in which 90% is spent outside of India. In terms of domestic and international passenger traffic India can be given position among the top three nations. The shortage of appropriate skills plays a major role in the growth of Civil Aviation. In the fields of aircraft engineers and technicians, cabin crew, ground handling staff, cargo handling staff, administrative and sale staff India is lagging and also in the area of trained pilots. To meet the demands of industry India have to improve the courses and infrastructure facilities provided by large number of private institutions in the field of aviation education and training. In priority India have to mention about the shortages. There are two implications for manpower like airlines/ airports / MROs cost of operations gets increased and other is safety implications [18].

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In the next few years, Indian aircraft maintenance, repair and overhaul sector will reach 14.2% so India will be positioned as a top of Asia, when compared with India there are expecting like overall growth rate will be less than half in future. There is a demand for labour resources to accommodate these needs in the aviation maintenance sector. In the next ten years, India is expected to earn triple the times in the overall earnings of MRO business [14].

2. Level of maintenance

Annual Safety Report will be released by International Civil Aviation organization. For statistical convenience specific groupings are assigned by Regional Aviation Safety Group (RASG) as regions. The specific groupings are AFI- Africa, APAC-Asia Pacific, EUR-Europe, MID-Middle East and PA-Pacific America. With respect to the need of adequate global aviation safety oversight, ICAO launched annual Universal Safety Oversight Audit Programme (USOAP). USOAP assess effective implementation of safety oversight system which involves 8 critical elements as per the ICAO’s safety related Standard and Recommended Practices (SARPs). Each country’s aviation safety capability is assessed and rated during USOAP audit. Annual Universal Safety Audit Programme (USOAP) is conducted by ICAO to find Serious Safety Concern (SSC) of Civil Aviation Authorities [10,11].

The 8 Critical Elements are identified as CE1 Legislation, CE2 Organization, CE3 Licensing, CE4 Operations, CE5 Airworthiness, CE6 Accident Investigation, CE7 Air Navigation and CE8 Aero-dromes. As per USOAP results on 2019 for licensing India is very poor in implementing the effective ICAO regulations. Among RASG-APAC countries with respect to ICAO safety report 2018 only 25.26% was scored by India for license implementation. 73.65% is the average globally awarded score for license implementation, even though 36.67% was scored by Thailand which is a poor performer as per reference table [10,11] (Table 1).

3. Maintenance training standards

For Indian Companies to enter into highly regulated international market, India needs an approval from a recognized aviation regulatory body like EASA [12]. This approval leads to the rapid growth of MRO activities in India recently. Upon inducting EASA as FAA lags in AME training curriculum standards, among Asia, India will play a leading role in providing MRO services. To meet the volume of engineers required to support the growth of aviation industry [4].

For Indian aircraft maintenance training organization approval, the technical standards and guidelines were provided by the Civil Aviation Requirements. To conduct approved aircraft maintenance training courses, to conduct examinations if permitted and to issue training course completion certificates, the guidelines and technical standards were discussed in the CAR 147. The basic conditions for issue, renewal, suspension and revocation of certificates attached to the approval and privileges were specified in the CAR 147 [5]. It is essential for the maintenance training organizations to be in an international standard as per CAR 66 [6].

Aircraft maintenance personal licensing system and EASA part 66 (general) to be combined together by drafting the CAR-66 (dated 5th February 2019) with current rule 61, which provides redefined modular pattern examination syllabus and Indian aircraft maintenance engineer’s license requirements for its qualification and extension. The revision 01 to CAR 66 issued revises the format of license and license conversation issued prior to it. Requirements for issuance of aircraft maintenance licenses for training, examination, knowledge and experience to adapt to complexity of different categories of aircraft are amended by issuing the CAR 66 issue II, which are its main features [6].

Aircraft maintenance licensing exam for 17 different modules under different airframe and engine category A, B1, B2 and B3 respectively are detailed in CAR 66 syllabus. The number of questions and time allotted for particular modular examination are classified for each module [7]. As per the Table in Category-A module 11A has maximum number of questions is 108 and maximum time is 135 min, module 5 has minimum number of questions is 16 and minimum time is 20, calculation of average number of questions and time allotted for Category-A module is 49 questions in 62 min (summation of total questions in Category-A divided by number of modules and summation of total time taken to complete all Category-A questions divided by number of modules) but module 9 Human Factor of Category-A has 20 questions and time 25 min [8]. Human factor module of category-B1B2 and B3 is same as minimum importance having modules or slightly more than that as per Table 2.

The casual human attitude is the primary factor for the majority of aircraft accident. Human factor knowledge should be broadly applied in order to decrease the accident rate and better understanding of human factor issues in aviation is needed [9].

If CAR 147 is effectively implemented majority of AME training institutes would not be approved. Only 10% of existing AME training schools are in approval with international standards as per 2010 survey by CAPA. The DGCA approved number of AME training institutes before and after the implementation of CAR 147 are same. The pressure to focus on the quality of student would have been greater, if India had a strong MRO sector with leading global operators. After several years of on the job training, engineers achieving their license of a long apprenticeship model were generally followed by airlines. This method of approach will not simply meet the volume of engineers required to support the growth of aviation industry [4].

The poor training infrastructure is one of the major disadvantages of Indian MRO sectors. The quality of institutes and technicians for MRO work approved by DGCA is poor, which is needed

| Country   | CE1 | CE2 | CE3 | CE4 | CE5 | CE6 | CE7 | CE8 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| Global Average | 75% | 72% | 75% | 71% | 80% | 57% | 67% | 62% |
| Thailand  | 29% | 8%  | 37% | 40% | 76% | 43% | 32% | 33% |
| Australia | 81% | 100% | 98% | 89% | 93% | 97% | 99% | 96% |
| Malaysia  | 81% | 75% | 77% | 84% | 85% | 76% | 77% | 49% |
| Nepal     | 91% | 50% | 69% | 86% | 94% | 19% | 56% | 71% |
| India     | 91% | 62% | 25% | 83% | 90% | 67% | 74% | 76% |
| China     | 81% | 92% | 99% | 87% | 88% | 69% | 88% | 89% |
| Philippines | 100% | 80% | 82% | 83% | 88% | 73% | 57% | 49% |
| Japan     | 91% | 82% | 85% | 88% | 95% | 90% | 87% | 92% |
for retraining every two years. At least 20–30 institutes that do not even have an aircraft in-house for training apart from few reasonable standards [4].

4. Easy framework implementation

EASA certification to Indian MROs will allow them to maintain and to release aircraft registered in European Union or to fit components on such aircraft. Suspensions of EASA approval for Indian MROs will not permit them to provide services to aircraft registered in European Union. Even if the MROs have DGCA and FAA approvals they need to have EASA approval for European Union registered aircraft. These MROs have to handle intense EASA audits on their documents, procedures, processes, stores, AME licensing, stock referring and parts issued or fitted in aircraft to get approved by EASA. The European aircraft lessors and owners are not convinced with Indian MRO standards as EASA approval is lagging. Even with FAA and DGCA approvals the European Lessor’s aircraft are maintained in Europe which affects the in-house MRO market [2]. With current fleet capacity India has a MRO market value of $900 million which will reach $1.75 billion if the ordered 1,000 aircraft are added to its fleet [16].

Indian government has realized the potential of Indian aircraft leasing market but India should develop a self-reliant leasing industry which will directly support its MRO industry. Ireland is the best example for aircraft leasing model as it is the earliest player in leasing industry. Irish aircraft leasing industry also creates opportunities in MRO, asset management, ancillary products, and aviation consultant services and in training, which contributes $660 million to the Irish economy [1].

There are 107 DGCA approved foreign MROs WHICH are providing maintenance services to leased aircraft and Indian registered aircraft but India has only 8 MRO organizations inside India approved by EASA that too for limited operations. Only 10% of the MRO business is handled by Indian MROs. DGCA is making efforts to streamline its licensing procedures similar to EASA system by entirely changing AME licensing as module system. Implementation of new DGCA regulations by training schools and its effectiveness in improving quality requires a long term observation by industries to gain confidence. The growth phase of Indian aviation and need of retaining the MRO market requires a quick change in regulation which will be accepted by the MRO industry. India should incorporate EASA framework and should concentrate in increasing the MROs and AME licensing with EASA approval than focusing reformation in DGCA licensing. This will set a platform for expanding MRO business in India [5,13].

China has developed its aircraft leasing industry successfully through its own leasing companies and by denominating leases through Chinese currency. Annually, 15% of the total domestic airline revenue contributing to more than 1.4 billion USD is paid as lease rentals by Indian airliners denominated in USD [1]. Increase in oil price effects in increasing ATF price and decreases Indian currency value with respect to USD which again increases the local cost of ATF and cost of payment in USD. Domestic aviation market depending on USD payment has become a barrier for hedging. Adding to the denomination barrier India imposes wide range of taxes which should be reduced or rationalized. If India follows China’s model and allows low taxed Indian Aircraft Leasing firms, which can accept Indian denomination, India could set an aviation culture like in Ireland. Also, this will increase high skill-based job, retaining Indian economy, offer new local investments, new local MROs and much more local industry opportunities [1].

India’s neighbour Singapore is a leading MRO service provider in South East Asia whereas Thailand started to implement plans to host full-fledged MRO ventures for providing services for Airbus and Boeing. The Singapore based MROs are expected to provide maintenance services for 16,000 new aircraft by 2036, valued at $2.5 trillion [16].

In addition to DGCA accreditation, EASA & FAA accreditation is required by the MROs to certify leased aircraft. In spite of advantages in Indian MRO industry such as promising domestic market, strategic location, rich pool of expertise and low labour cost, the industry faces crisis through it’s the wide range of taxes, non-availability of local investors in MRO, foreign lessors, USD payment for lease rentals and fluctuating ATF pricing. Thailand faced same scenario as 60% of its MRO was outsourced. In 2017 Thailand took measures to improve its MRO business by reducing the tax and by promoting MRO, in turn which allowed Thailand MROs to increase their quality and attracted more business [16].

DGCA has increased the period of retaining imported spare parts from 90 days to 180 days and the import duty has been waived of by the government which has provided a short favourable position for Indian MROs to import and store spares but this is not going to help the MRO industry to improve the current state. Due to several unfavourable taxes in the year of 2019 the Indian aviation is struggling to cross 10% of its growth but as per the Indian economy’s expected 6.9% growth the aviation should have experienced 14% growth [15,20]. Realizing the tax hurdles faced by MRO sector India has reduced its MRO taxation from 18% to 5% during March 2020 [21]. This reduction in MRO taxes will increase MRO settings in India which will help India to move towards becoming global MRO hub [19].

5. Leasing industry need

81% of total commercial aircraft operated in India are leased aircraft whereas leased aircraft shares 53% in global and 52% in Asian aviation market. India is not having local leasing company all the leasing companies as foreign companies. India should have lessees from India [3].

6. Conclusion

Aiming to improve EASA approved MRO organizations in a rapid phase needs an intense focus on improving the standards and documentation. Preferring EASA approval than DGCA approval will require increase EASA approved AME. The need for EASA approved AMEs will increase EASA approved training institutes which is
directly coupled with EASA approved MRO existence. The scenario of maintenance training will continue post covid-19 as before. This change in approach in licensing will increase trust among existing foreign leaders to maintain aircraft with in which India which will further increase the number of EASA approved MROs. After the increase in MRO business India should focus on paying the MRO in Indian denomination and should waive or rationalize existing taxes which will allow both the airline and MRO business to experience sustainable profit. This strategy will encourage Indian investors to start aircraft leasing companies which will further increase the MRO market players in India. Thus increased MRO investment opportunity will provide a healthy competition among the MRO investors which will increase the quality of maintenance. This focused development approach will retain the existing $900 Million USD MRO expenditure inside India which is 10% of the expenditure now. Retaining 100% MRO business will contribute 0.03% of India’s $2.72 Trillion USD economy. Attaining this mark will not only benefit India to retain its own MRO market but also will ensure to become a global leader in MRO market.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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