Indian and Chinese Aviation Industry: The EASA Framework Option

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Abstract

Purpose – This viewpoint article intends to increase the awareness on the demand faced by the technical sector of the Indian and Chinese aviation industry and how this can be met by the adoption of the European Aviation Safety Agency (EASA) regulatory framework.

Design/methodology/approach – A brief overview of the challenges that the Indian and the Chinese aviation industry is facing is provided, in terms of meeting the demand for sustainable growth. A description of the structure of the EASA framework and its main characteristics is presented, along with focused discussion on it applicability to the Indian and the Chinese aviation maintenance and broader continuing airworthiness sector.

Findings – The EASA regulatory framework can offer a safe and business effective solution for the Indian and the Chinese aviation industry, aligning with world’s best practice.

Practical implications – A discussion in adopting the EASA framework in India and China can be helpful in increasing awareness and assisting decision makers in realise that this is a possible option.

Originality/value – This view point article can be useful in provoking discussion, by summarising the key issues and points surrounding aviation regulation standardisation in India and China, along the lines of the EASA framework. Moreover, some possible ways to increase awareness around EASA in India and China are discussed, from the point of view of influencing tomorrow’s decision-makers.

Keywords Aviation, European Aviation Safety Agency, Safety, Regulations, Aircraft Maintenance, Airworthiness
Introduction

India and China are expected to play a key role in the expansion of the aviation sector in Asia in the coming years. This is attributed not only to the scale of their economies but also to the size of their populations. According to the 2015 Word Bank data, the population of India (1.31 billion) and China (1.37 billion) combined accounted for 37% of the total global population (7.35 billion) (The Word Bank Database, 2017). Any increase happening in the disposable income of the middle class is driving growth in air transportation. This is evidenced by the fact that the air traffic growth in India and China is much faster than that average global growth. For example, when examining the 2012-2015 carried passengers’ figures for India and China (Table 1) one can notice that the growth rate in these countries is almost double (i.e. 37/38%, as opposed to 19%).

Table 1. Air transport, passengers carried (million) in India, China and global level between 2012-2015.

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2012-2015 %Change</th>
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<tbody>
<tr>
<td>Global</td>
<td>2894</td>
<td>3048</td>
<td>3218</td>
<td>3441</td>
<td>+19%</td>
</tr>
<tr>
<td>India</td>
<td>72</td>
<td>76</td>
<td>83</td>
<td>99</td>
<td>+38%</td>
</tr>
<tr>
<td>China</td>
<td>318</td>
<td>353</td>
<td>391</td>
<td>436</td>
<td>+37%</td>
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Traffic growth is affecting the industry’s supporting services, such as technical and engineering services related to the operation and maintenance of aircraft. Covering the anticipated needs for air transportation and operating a functional aviation industry is therefore a challenge which these countries have to meet in the near future. Regulation, as a primary characteristic of the aviation industry, is part of the solution but also part of the problem in moving towards a sustainable growth in the technical sectors of the aviation industry. Looking at the aviation maintenance business sector, broadly speaking as the industry is quite complex in terms of the services provided apart from direct provision of maintenance, it is important to note that this is greatly affected by regulation, both in local (country) and global level. It is therefore interesting to examine how this sector can ride the wave of demand. This article intends to increase the awareness around this issue and provoke a discussion on how best practice in other parts of the world may have to be considered as a way forward. However, it is noted that this viewpoint paper does not intend to compare the EASA with the FAA framework, rather than highlight the level of penetration/influence of EASA in global level. The benefits of an EASA alignment for the Chinese and the Indian aviation industry are already outlined in this work, focusing on the aircraft maintenance and (more broadly) the continuing airworthiness sector.

India

The Indian aircraft Maintenance, Repair and Overhaul (MRO) sector is expected to experience a 14.2% annual growth over the next few years (Khawaja 2011). This figure places India on top of Asia, where overall growth rate is expected to be less than half compared to India. Moreover, in monetary terms, the overall earnings from the MRO business in India is expected to triple in the next 10 years, from 560 to 1,800 million US$ (Khawaja 2011). To accommodate
this need there is clearly a demand for increased manpower resources across all the aviation maintenance sector in:

- Aircraft heavy maintenance / Base maintenance;
- Line maintenance;
- Aircraft components’ modification;
- Engine overhaul;
- Continuing airworthiness management;
- Airline operators (engineering departments and in-house technical operations);
- Aviation regulatory authorities

A clear example, is the total manpower requirements for airlines which has been estimated to rise from 62,000 (2011 data) to 117,000 staff by 2017 (NTDPC 2013). Achieving this level of growth is not trivial and it is questionable how the existing aviation regulation framework is capable of accommodating this effectively and in an efficient (timely) way. The rapid growth of the aircraft MRO activities in India means that approval from a world recognised aviation regulatory body such as the European Aviation Safety Agency (EASA) is of critical importance to Indian companies entering the highly regulated international market. This relates directly to the ambitions of India playing a leading role in providing MRO services in Asia. Moreover, adopting the EASA approach and regulations would assist in transitioning to a work safe culture capable of sustaining the growth rates. However, decentralisation of the functions (such as delegating the authority to conduct basic licensing examinations) would be a challenge for the current mode of operation of the Indian Directorate General of Civil Aviation (DGCA). It is noted that the EASA framework, when compared to the existing Indian framework, can offer improved awareness around human factors and safety management systems (SMS), which is key to the strategic focus of EASA in improving aviation safety.

**China**

The rapid growth and ambition of the aviation sector in China is widely reported (Fallows 2012, The Economist 2014) and is underlined by the relatively recent establishment of new engineering facilities [e.g. Airbus Engineering Centre, Beijing (Airbus 2015)], Training centres [Hua-Ou Aviation Training Centre (Airbus 2015), subsidiary of Airbus] and fleet servicing facilities (Boeing Service Centre, Beijing, opened 2011 (Boeing 2011) by the largest international aircraft manufacturers. In addition, over half of the Airbus fleet in service worldwide has parts produced by Chinese companies and continued expansion and cooperation is forecast (Airbus 2015).

Similarly to India, the anticipated growth trajectory of the MRO sector in China means that approval from a world recognised aviation regulatory body (e.g. EASA) is of critical importance to Chinese companies with ambitions of supplying MRO services and technical staff into the lucrative, but highly regulated, market. It is characteristic that by 2035 119,000 new technicians will be needed in China alone, out of the 268,000 total in the Asia and Pacific region (Boeing 2016). Recognising the benefits of EASA, Chinese subsidiaries of European companies, such as Airbus-helicopters (MRO facility based in Shenzhen (Airbus Helicopters 2014) and Liebherr-Aerospace (Repair station, Shanghai) (Liebherr 2014) have sought and
obtained EASA Part 145 (Aircraft Maintenance Organisation) certification for their base-maintenance facilities in China.

At the regulatory level, EASA and its Chinese counterpart (Civil Aviation Administration of China, CAAC) have been engaged in ground-work projects aiming to address regulation harmonisation and reform, such as the EU-China Aviation Partnership Project (APP) (EASA 2015). Regular exchange has fostered better understanding of what the EASA framework offers and how it works, as well as closer collaboration between the authorities. However, FAA has a strong influence in the Chinese regulatory framework, through similar collaboration programmes (US China Aviation Cooperation Program 2017), the continuous interaction with Boeing in commercial activities and via a significant number of CAAC regulations mirroring FAA regulations.

The EASA Framework as a Candidate

Historically, aviation safety regulation has been a key factor to achieve both business development and sustainment. Since its inception, the European Union (EU) developed aviation safety regulations framework (EASA) was clearly focused towards this direction. Standardising practice across the EU brought clear economic benefits to the member states, both in the field of aircraft manufacturing but also operations (flight operations and technical operations). It is however of note, and definitely one of the main achievements of the EU, how quickly this aviation regulations framework became a truly global framework, overpassing in practice the influence of the well-established Federal Aviation Authority (FAA) regulatory framework (embedded in more or less extent in the national regulations of several countries). However, the FAA maintenance training basis (curriculum) has long recognised weaknesses in meeting the global industry needs (GAO 2003), which is considered to affect negatively its attractiveness in both India and China.

It is of note that in the key growth area of Asia and Pacific EASA has achieved a very significant penetration particularly in the area of continuing airworthiness and maintenance related regulations, practically influencing directly or indirectly most of the key players in the region (e.g. Australia, Singapore and Malaysia).

An overview of the significant benefits and importance of adopting EASA for Indian and Chinese aviation organisations (aircraft and component manufacturers, part suppliers, MRO and training providers) are summarised in the next sections. Benefits of EASA for both India and China can be broadly divided into 2 categories:

- Increased level of standardisation, offering, therefore, safer practice;
- The potential for expansion of the Indian and Chinese aviation sector through access to lucrative international markets.

Standardisation

A look at the technical aspects of an airworthiness framework can be revealing on how proper standardisation can help in achieving safety and business growth. In Fig. 1, the main constituent functions of such a framework are presented, showing also the interactions between the initial and continuous airworthiness regime. From this graph it is clear that the complexity can be accommodated in a structured approach, requiring competent processes, procedures and
people. Looking closer at (aircraft) maintenance and (operations) engineering and the communication loop with the initial airworthiness side, it is apparent that countries wishing to be on both sides (manufacture and maintain aircraft) have to keep this loop active (such as the case of India and China).

![Diagram](image)

**Fig. 1** Technical aspects of an airworthiness framework.

The EASA framework is structured around this concept, by employing a set of robust processes and most importantly an organisation-based philosophy/approach, as opposed to the FAA philosophy. In a multi-national, multi-culture and geographically dispersed operation (both in terms of manufacturing and flight/technical operations) the organisational approach has proven to be more effective, as it raises the level of responsibility/accountability of actions to the level of organised groups, rather than individuals. Taking into account the very nature of the aviation industry today, namely a heavily internationalised industry experiencing a tremendous need for highly specialised staff, it is critical to ensure that safety is managed in a standardised way. This standardisation is not simply a compliance exercise but rather a measure to avoid compromised safety performance by the industry’s very diverse (internationalised) character. Adoption and compliance with the EASA regulatory framework would ensure that India and China meet one of the most comprehensive and stringent world class aviation standards in relation to the following:

- **Aircraft Maintenance Organisation (AMO) approval (EASA Part 145):** Requirements for the establishment and operation of aircraft maintenance repair and overhaul facilities. This would extend in aircraft parts overhaul, both for newer and older aircraft types.

- **Certification of maintenance staff (EASA Part 66):** Licensing of maintenance personnel with clearly defined privileges, namely: Category A Aircraft Maintenance Mechanic, Category B1 & B2 Aircraft Maintenance Technician and Category C Aircraft Maintenance Engineer licence. An interesting step towards this direction was made in 2011 by the Indian DGCA, with the introduction of the Civil Aviation Regulation (CAR) -66 for aircraft maintenance licensing, mirroring in practice the EASA Part 66 regulatory requirements (DGCA 2017).
- Maintenance Training Organisation (MTO) requirements (EASA Part 147): Establishment and operation of maintenance training schools. India has recently established the first EASA Part 147 MTO while China operates a few schools offering basic and type training (EASA 2017). Clearly, the demand gap has a long way to be filled, through the addition of more indigenous (Indian and China based) MTOs.

- Design organisation approval (EASA Part 21): Design of aircraft, aviation components and approval of modifications and repairs. Entering the design approvals’ area would provide a strategic advantage to India and China, compared to the other Asian countries, as both have a vast pool of University-qualified engineering staff, while growth and job creation in this field would attract talent from overseas that have working experience from Airbus, Boeing, Embraer, Bombardier, etc.

- Continuing Airworthiness Management Organisations (EASA Part M): The EASA Part M Subpart G concerns the establishment and operation of a CAMO which coordinates the compliance of an aircraft with maintenance programs, airworthiness directives, service bulletins, etc. CAMO would be completely new concept for both India and China. However the continuous expansion of the aircraft and engine leasing sector and the need of the leasing firms to outsource the fleet management technical activities is expected to create more business for the CAMO sector (both the existing ones and newly established CAMOs).

**Expansion of the Aviation Sector**

EASA approved Indian and Chinese organisations (e.g. Maintenance / Training / Design / Continuing Airworthiness) will have access to lucrative international markets in terms of provision of aircraft, aviation products, training, engineering services, MRO services and maintenance programme development (continuing airworthiness). This has the potential to create employment, new revenue streams (e.g. servicing of international airline fleets in India and China) and allow expansion of the Indian and Chinese and potentially internationally through subsidiaries. Linking with the plans of both countries to expand more their aerospace manufacturing capabilities and portfolio, it certainly offers added value to be attached (directly or indirectly) to a regulatory framework such as EASA, which treats (initial and continued) airworthiness management holistically.

EASA approved base maintenance facilities will have the ability to handle in-depth MRO activities in India and China to the standard provided by international aircraft manufacturers such as Airbus and Boeing. This is attractive for Indian, Chinese and international operators (e.g. Middle East airlines) utilising EASA certified aircraft in the Indian and Chinese airspace and will also allow expansion of the MRO sector. Currently, growth in the MRO sector is constrained by the very complex and sometimes inconsistent national regulatory frameworks in India and China. Moreover, streamlining the AMO’s approvals’ process is another area that can benefit from an EASA-based or EASA-mirrored system.

In aviation maintenance training and staff certification, EASA approved Part 147 MTOs will provide a steady supply of engineering and technical staff trained to the highest international
standards for employment in India and China or at worldwide subsidiaries of Indian and Chinese companies exporting aviation services abroad. Moreover, EASA approved technical staff holding Part 66 aircraft maintenance licences have the opportunity to meet the airlines’ and maintenance organisations’ demand, without the need to undergo country-specific training and certification (as it currently happens). This offers not only great flexibility for the companies and the individuals, in terms of mobility and acceptability of their qualifications and licences, but also ensure a very high standard of safe maintenance practice.

Conclusion

Shifting to the European Aviation Safety Agency (EASA) framework should be a well informed decision. Any decision maker should make this argument, for the shake of the cost and drastic change involved in this move. However, leaving aside country-scale politics and geopolitics, it is widely acknowledged that the EASA framework is a truly globalised standard and as such it would make sense for non-European Union (EU) countries to adopt it. This is also supported by the numerous South East Asia and Pacific and Middle East countries that have already accepted the EASA framework for the regulation of technical operations, maintenance, etc. (e.g. the Australian Civil Aviation Safety Authority, CASA, has adopted in very large extent the EASA framework). It is suggested that India and China should consider the same and in a timely manner, so as not be left behind in the aviation growth race.

Opening and, in fact, extending a discussion on this would greatly assist in finding the ways to converge towards the EASA framework. Nevertheless, as with any change of this magnitude, finding a working balance between current practice and structure and strategic goals would require a guiding vision. To this end, greater interaction with EASA and its ambassadors (of any nature, i.e. aircraft manufacturers, Maintenance Repair and Overhaul (MRO) organisations, training organisations operating in the EU) could act as a catalyst for a smoother transition to an EASA-based framework. It is also believed that EU-offered education and training (e.g. University Degree programmes and EASA Part-147 courses) can play a very important role in influencing positively the next generation aviation leaders of India and China towards the adoption of EASA. Early and mid-career aviation professionals who have the opportunity to witness first-hand the EASA framework operation (e.g. working as EASA-licensed aircraft maintenance mechanics/technicians/engineers, engaged in education/training conducted at EASA-approved organisations, etc.) can be quite valuable in promoting and leading the change process in India and China. EASA-approved/affiliated/supported education and training courses can have a real impact in that regards.

References


