June 2023

100 KNOTS

India's Aviation Ecosystem

Business
Economics of Inflight Magazines

MRO
Growing Indian Fleet & MRO Challenges

Human Resources
Availability of Technical Workforce

Flight Operations
Dilemma of Pilot Retention & Business Relevance

Security
Human Trafficking in Aviation

A Kerospace Solutions Company

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EDITORIAL DESK

Radhika Bansal
Editor

Dear Colleagues,

Welcome to the June 2023 issue of the 100 Knots Magazine.

It is with a sense of urgency and responsibility that we dedicate this issue of our magazine to shed light on the disturbing reality of human trafficking by aviation. As one of the most pressing global issues of our time, human trafficking not only violates the fundamental rights of individuals but also undermines the very fabric of our society. We firmly believe that aviation can play a pivotal role in fighting this heinous crime and ensuring a safer world for all.

Aviation, with its unparalleled reach and speed, has transformed the way we connect with each other and explore the world. However, it is disheartening to acknowledge that traffickers exploit these same capabilities for their nefarious purposes, using airlines and airports as conduits for their illegal activities. The illicit transportation of men, women, and children across borders under the guise of legitimate travel is an appalling violation of human rights, and it demands our unwavering attention.

Our aim is to create awareness, generate dialogue, and advocate for change. Human trafficking can only be effectively combated through collaborative efforts involving governments, aviation industry stakeholders, law enforcement agencies, NGOs, and the public at large.

As always, Contributions, comments, and feedback are always welcome. All papers are received with a high degree of enthusiasm and will find a home in future issues.

Our sincere thanks to all the contributors for their support and interest.

We hope to hear from you soon!

Happy Reading!

100 KNOTS

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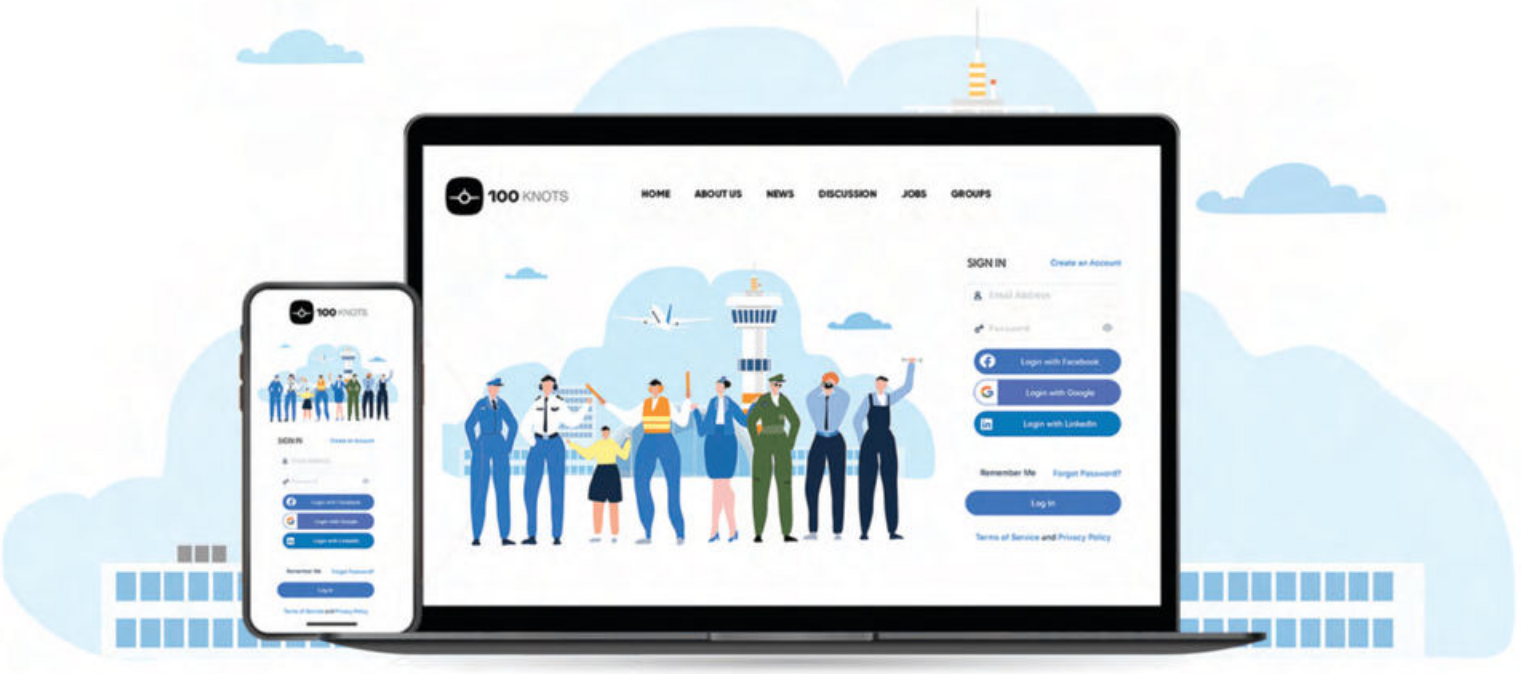

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中國東方航空 CHINA EASTERN
B-919A
C919
1st C919首航

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AVAILABILITY OF TECHNICAL WORKFORCE

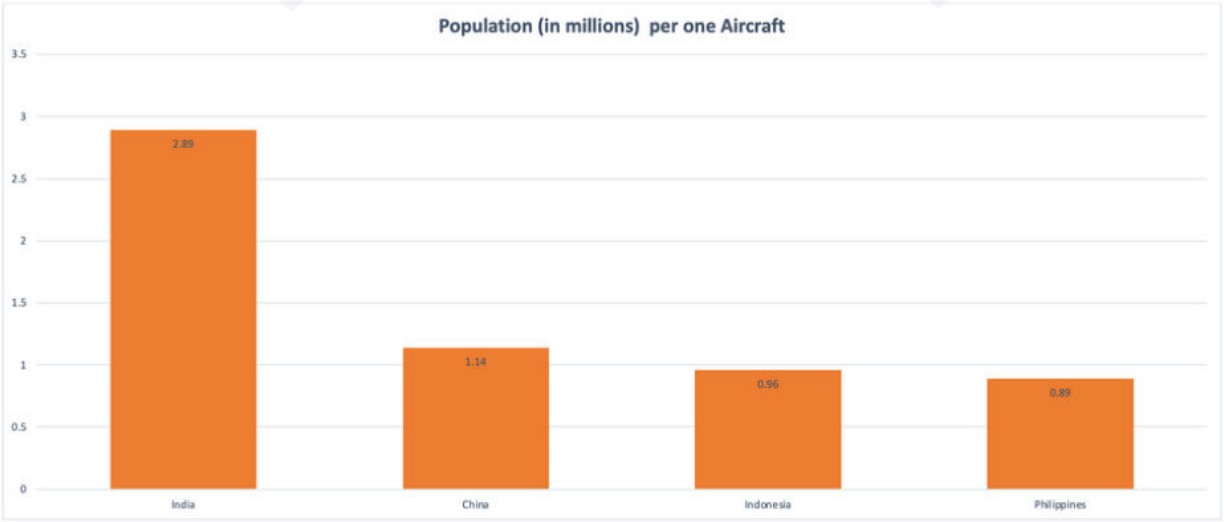
Indian Commercial Aviation MROs

Cdr Amogh Warhadpande (Retd)

In the recent past, India was insignificant in the International Aviation Arena. In 2010, China, despite having only a 15% larger population, had domestic traffic that was five times larger. India's one aircraft per 2.89 million population compared poorly to China's figures of 1.14, Indonesia's 0.96 and Philippines' 0.89 (1) (Fig1). India had barely 0.6% of helicopters and 0.07% of freighters in the world (1). But for the period 2023-33, it is predicted that India's fleet size and Maintenance Repair and Overhaul Industry (MRO) will show an annual growth of 8% and 9.1% respectively which is larger than APAC's 5.2% and 7.2% and China's 4.8% and 8.8%. (2) (Fig 2). India will be the 3rd largest aviation market in terms of aircraft, engines, passengers, and related businesses by 2024 (3) and have 50% more airports by 2040 (4). According to recent Airbus and Boeing studies, there will be a requirement of almost 0.2 million Technicians by the year 2035 to maintain increased fleet sizes.

To facilitate this growth, initiatives to promote aviation in the Civil/ Military sector and provisions for Investment, Taxes, Infrastructure for MRO are needed. (5,6,7) Increasing Fleet and Flying hours will mean increased MRO business only if MRO industry is supported. Survival of MROs without a consistent supply of high Quality and Competent workforce is unimaginable. It is predicted that the Aviation Industry will provide employment to 25 million by 2040 (Including Direct, Indirect and Induced jobs) (8). Spending on Maintenance accounts for 12-15% of Revenue (4). This emphasises that maintenance capability is essential for rapid growth of airline industry and by consequence, growth of an economy. Therefore, MROs and availability of Technical manpower will be critical. In light of the statistics discussed, it is concerning that there is little awareness of the issues pertaining to technical workforce. The MRO industry operates behind what appears to be an Iron Curtain. A testimony to this, is that the 130 page document for Vision 2040 for Civil Aviation in Industry in India (2019), devotes only one very superficial paragraph lamenting the quality of AMEs in India whilst devoting four pages for pilot training.

Figure 1



Fleet Size and MRO Growth 2021-31

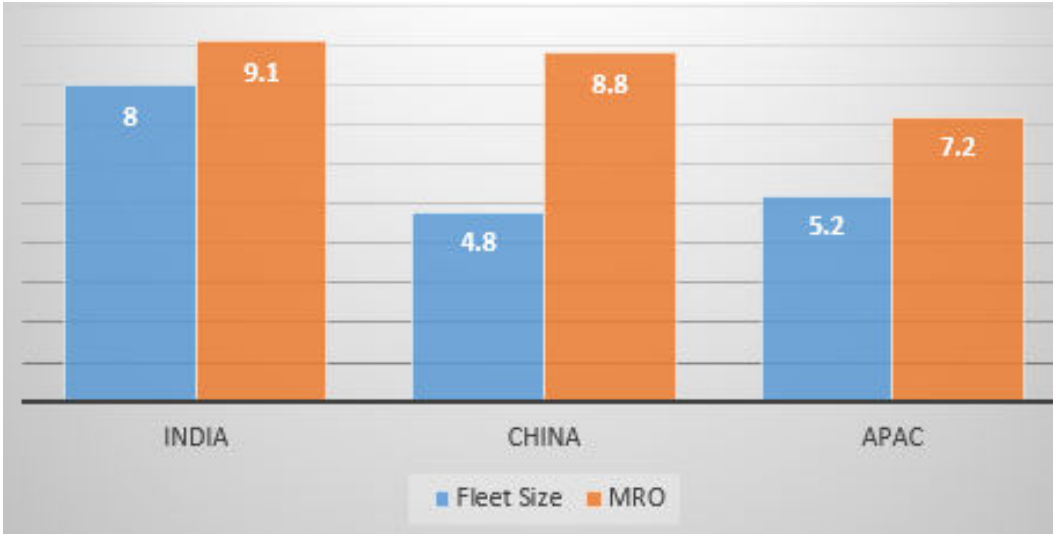
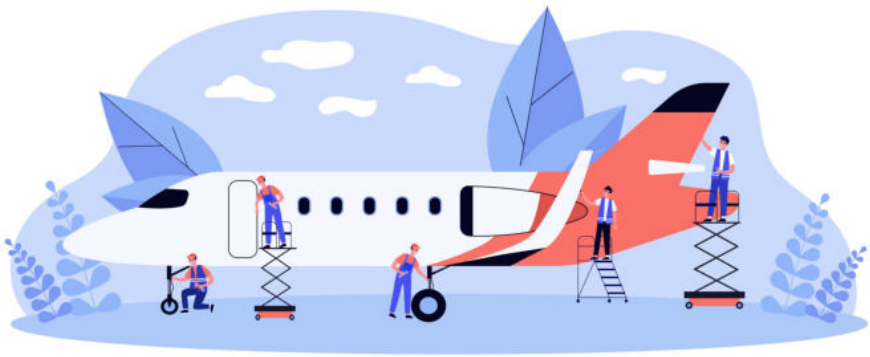


Figure 2

Importance of Technical Workforce



Silently and behind the scenes, this workforce is responsible for airworthiness of aircraft to earn revenue for the airlines. Technical Manpower comprises 20% of Airlines and between 50-70% of MRO workforce. In India, Technical Workforce requirements for MROs in the period 2015-2035 will see an increase of 25X (8).

Therefore, it is imperative to ensure that the next generation of Technicians and Engineers is mentored and skilled carefully. Leading MRO destinations in the APAC, Singapore and Malaysia, have shown foresight in being future – ready. India needs to follow suit and address the challenges in providing skilled manpower to the MRO Industry.

ICAO conducts a Universal Safety Oversight Audit Programme (USOAP) survey amongst its 191 members once every three years for which it has identified eight Critical Elements for Flight Safety. A Global Average is calculated for each of these Critical Elements. One of the Critical Elements, "Technical Personnel Qualification and Training" scored the Lowest Global Average and showed a considerable drop of almost 30 points since the previous Audit (9) (Fig 3).

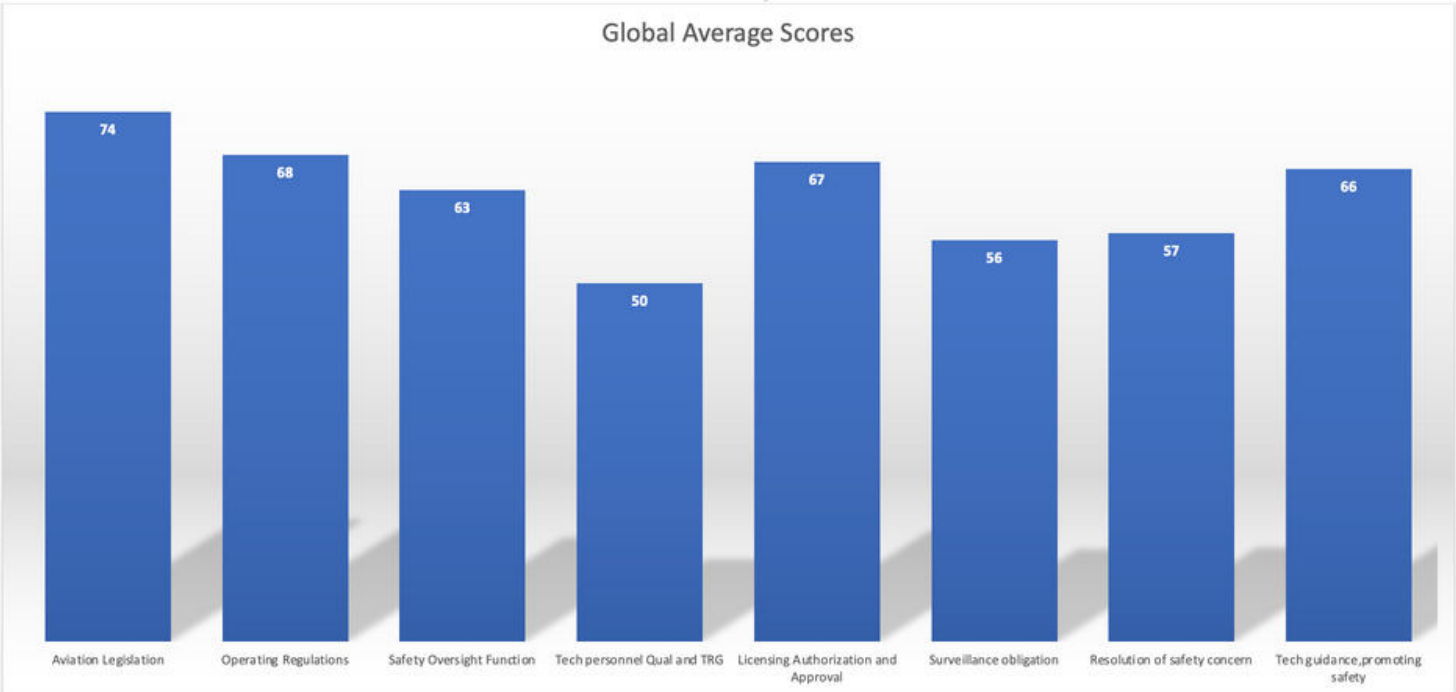


Figure 3

Challenges

MROs in India face the following challenges in scaling up Skilled workforce availability in terms of Capacity, Capability and Competence.

Institutional Infrastructure / Curriculum Completion

As on 28 Feb 2023, India had 54 DGCA approved Aircraft Maintenance Engineering (AME) Colleges (10). These provide the bulk of AMEs and Technicians for Civil Aviation. The licensing requirements include completion of two years curriculum with DGCA authorised Civil Aviation Requirements (CAR)147 Basic approved Institution including approx. 300 Hrs of Operational Environment Practical Training (OEPT), followed by 2 years of experience in a CAR 145 approved organisation, clearance of all DGCA examination modules for the respective trade and undergoing a CAR 147 approved Type Training on specific aircraft culminating in a Structured on Job Training (SOJT). An AME aspirant must then obtain a licence from the Directorate General of Civil Aviation (DGCA) endorsed for specific aircraft and equipment installed therein. This process could take 5-8 years or even more and could cost INR 15 – 25 Lakh (11). For General Aviation, the Type Training itself can cost INR 30 - 40 Lakh per aircraft. For such a critical job description, there is no centralized, transparent Entrance Examination and no control on Standardization and Quality of the Training processes. The AME course is not recognised as a Graduation Degree, the lack of which precludes AMEs / Technicians from applying for many job roles and limits their career progression. This is a potential cause for a demotivated workforce. Some AME colleges now provide students with a backup degree program, but these degrees rarely meet Industry Standards and place an additional burden on students in terms of time, effort and money. Considering a conservative annual throughput of 1500 students, India does not have the necessary infrastructure for students to complete curriculum requirements of OEPT, Type Training and SOJT, thereby delaying Training completion. Most students need multiple attempts to pass DGCA module exams (prerequisite to be eligible for a Type Course, SOJT and Licensing).

Many candidates give up after a few attempts and try their luck in allied verticals in Aviation or attempt alternate careers which adds to the lead time and expenses involved. Some students manage to complete a Type Course but are not able to get a SOJT in a CAR 145 organisation. Even if they do get a SOJT, they are unable to complete their SOJT on time (SOJT needs to be completed within a period of 3 years of completing the Type course otherwise the Type Course is invalid)(11). Consequently, those students who have not been able to complete all steps mentioned above, have no choice but to work as lowly paid Technicians with limited scope of career growth (in terms of job role and compensation). Students then attempt to get a EASA License or go abroad to work as Technicians at a better compensation. This further adds to time and money invested. Career goals are thus denied due to uncertainties and unavailability of curriculum constituents.

Entry Barriers

Requirement to spend INR 30-70 Lakh with delayed or no RoI, prohibitive and recurrent Training cost, no assurance of timely resource availability to fulfill compliance requirements, long lead time for qualifications, need for continuous Upskilling, ageing workforce, and lack of transparency in Regulatory Policies are entry barriers for aspirants and obstacles for those already well entrenched in the system. Unless sponsored by organisations, it is difficult for individuals to afford Training expenses. One would rather choose an alternative career option in favor of better ROIs and working conditions. (11)

Industry Demand / Supply

The demand of AMEs is volatile and dependent on fate of airlines within the country and state of aviation in the neighboring economies. In India, this is an employer's market except in rare instances of highly qualified AMEs and experienced/skilled Technicians. COVID 19 further worsened the situation by creating an excess supply. Manpower Retention of existing workforce to maintain continuity in Operations is a challenge due to inter organization poaching and constant brain drain abroad. (11)

Career Growth / Compensation

Technicians face stagnation in terms of job roles and compensation after 6-8 years. In India, these roles are not highly paid and skilled workforce choose to migrate to Middle East, Europe or Southeast Asia (11). A small percentage who manages to qualify as licensed AMEs also find limited opportunities for career growth and most reach saturation levels without a hope of ever captaining a Base or Line Maintenance Station.

Additional Burden - Acceptability of Indian Standards

As opposed to blanket acceptance of Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA) in India, lack of acceptance of DGCA credentials by American/European aircraft lessors, airlines and owners necessitates need for MROs to obtain and maintain FAA / EASA accreditations and approvals. Consequently, the AMEs need to equip themselves with EASA licenses to increase their survival chances in the industry which burdens them with additional cost. This cost is considerable as EASA SOJT is not available within India. This fosters a tendency of EASA license holders to seek greener pastures abroad to quickly obtain a RoI on the cost incurred in getting their EASA license.

Technology Shift and Employability Gap

Given the continued focus on environmental concerns airlines are transitioning to a more fuel-efficient fleet, new generation aircraft and investing in new technology. (7) The surging oil prices will accelerate this transition and necessitate Time Bound Upskilling/Reskilling. Boeing 737 MAX (growth from 6% to 27 % of global narrow body fleet) and Airbus A 320 NEO (growth from 15% to 39 % of global narrow body fleet) are already forcing the Boeing 737 NGs and Airbus A 320 CEOs into an early retirement.(2)(Figure 4) Airframe MROs which were hitherto resilient because of mandatory calendar driven maintenance requirements will see reduction in maintenance needs and scope of work in check packages due to higher reliability of components and use of predictive and prescriptive maintenance models. With the advent of electric, lithium and hydrogen-based propulsion imminent, the employability gap needs Training infrastructure and opportunities for students to work with new technology to keep pace.

Can MROs afford to pay attractive salaries?

The challenges brought out thus far prevent MROs in India from being competitive and impact their net profitability. Therefore, MROs are unable to pay attractive salaries to their employees making it a destination for those who haven't been able to find better opportunities, or for those who are waiting for attractive opportunities thus keeping the workforce in a permanent state of flux.

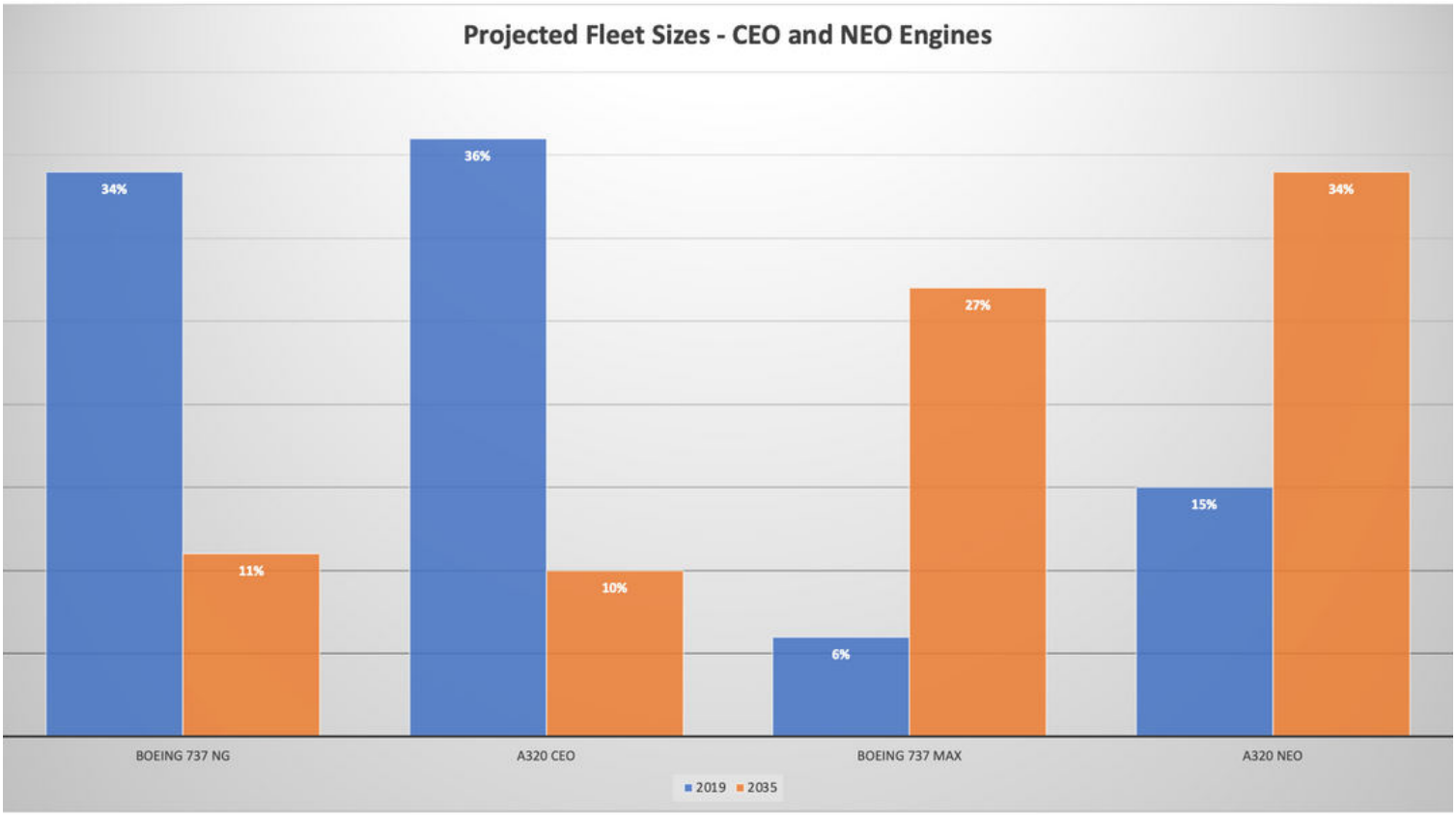


Figure 4

Remedial Measures

The challenges brought out can be mitigated and overcome. Air Works Group, as a leading MRO in the country, has deployed some of the solutions discussed below and played a crucial role in training the workforce for tomorrow (more than 8000+ Candidates upskilled in 147, 147 Basic and 145 verticals in the last four years).

Process Improvements to Overcome System Inefficiencies

Rising costs of oil and shortage of supply will increase maintenance costs and create a skilled labour shortage (7) by forcing implementation of Technology shifts in Maintenance Strategy from Reactive / Preventive to Predictive / Prescriptive. This will need a major upskilling initiative to remain relevant. Predictive and Prescriptive maintenance and use of drones in maintenance activities will entail corresponding changes in Training requirements and abilities of the maintenance personnel of the future. Training Organizations need to incorporate skills in Lean Management, Six Sigma, Block Chain Artificial Intelligence and Machine Learning for Waste Reduction, Process / Efficiency Improvement, Transparency, Security, Traceability, Scrutiny and Tamper Proofing of processes to reap the benefits of Prescriptive and Predictive Maintenance. Training needs to focus on skills relating to usage of real time big data and analytics tools to facilitate overall growth, infrastructure upgradation, improved efficiency,

quality of service and Maximising Manpower Utilisation. This will have the desired outcome of maximising Revenue Passenger Kilometres (RPK). These improvements would be essential to achieve Business Value from analytics in aviation by obviating the need for several costly and time consuming inspections(12).

Training Reforms (8)

Aviation Industry requires a diverse set of skills which are process oriented, regulated and need periodic upskilling. These include Technical, Commercial, and Soft Skills. Presently there is a lack of a Unified Common Policy and Standards to achieve the goal of skill building towards producing the vast number of Human Resources that would be required to sustain aviation in India in 2035. There appears to no convergence of thought and effort between NSDC and DGCA in providing a one stop solution for all Aviation related Training Needs. To standardise the quality and bring in transparency, an apex National Civil Aviation Training Entity functioning under the aegis of a National Aviation University should be established to oversee all Training related activities for the Civil Aviation Sector in India. This body needs to have a unified view of Training and Skill building. Starting with creating awareness about the aviation sector, it needs to work towards preparing a skilled workforce across verticals in Aviation that is capable of meeting the demands of new Technology, bring in investments towards Training and implement best practices in the industry by forging International Collaborations so that Indian Regulatory bodies have a wide acceptance worldwide.

A National Level One Stop Training Solution and establishment of Centers for Excellence for employees, aspiring professionals, and vertical specialization to bridge the Industry, Academia and Regulatory Gap will provide Upskilling, Transparency, Standardisation and Regulatory compliance. To augment this, Industry needs to step in to provide necessary infrastructure requirements for the curriculum and provide expert inputs on Training Policy, Curriculum Development, and placement facilitation. In order to utilise the best that the industry has to provide, Centres of Excellence for Training can be collocated with the Industry hubs at Bangalore, Hosur, Cochin, Hyderabad, Nagpur and Delhi. To cut down on overheads, airports need to be utilised as in-situ Training Centres to provide practical exposure. The infrastructure of ITIs across the country can be utilised for courses focussed towards bridging the skill gap. The vast wealth of experience of Armed Forces Veterans can be harnessed by employing them as Instructors for building this future ready workforce. Implementing Global Best practices by emulating efforts of CFA, Institute, USA and Turkish Aviation Academy, and broadening the scope of National Program on Technology Enhanced Learning (NPTEL), the high training costs (biggest Entry Barrier) can be brought down by employing the Unified Content Development Massive Open Online Courses (MOOCs) Model, especially in Continuation Training.

Retention Strategies

There is a high rate of attrition amongst the MRO industry Technical workforce. This is mainly due to movement of AMEs and Technicians between Airlines, MROs and OEMs in search of better opportunities. Advent of new airlines or collapse of existing ones makes the situation volatile. The attrition is maximum at the base and middle layer of the pyramid, i.e the junior and mid-level technicians / AMEs. Retention by increasing compensation does not always work as this has considerable financial impact due to the sheer weight of numbers and there is no guarantee that the retention will succeed long term. The best retention strategy would be to create a pool of loyal and motivated employees by providing the college students a clear and time bound path towards achieving their career aspirations by providing them with opportunities for OEPT, 145 Experience, Type Training and SOJT in the MRO itself. This is advantageous for all concerned as the students get paid (instead of incurring expenses to the tune of INR 10-15 Lakh) for the 145 experience and the Type Course and SOJT is sponsored. The colleges gain because they can promise the students an end-to-end service thereby improving enrolment and placement records and the MROs gain by having a stable workforce and a consistent feeder channel for the lower and mid-level workforce.

Industry Role

Industries need to play an active role as Training Partners and provide infrastructure support to fulfill the students curriculum and experience requirements. MROs need to drive Industry-Academia Partnerships, Awareness Programs, On Job Experience, Apprenticeships and Outreach / Quality Improvement Programs to create Industry ready Manpower and aid in Human Capital Development.

Conclusion

The projected growth of Civil Aviation in India and in APAC will be an affordable reality only if MROs in the region survive, sustain and grow. It follows that Capacity, Capability and Competence of Technical Manpower available will decide the fate of the contributions that MROs can make to the economies in this region. Technology changes are imminent. These will be accelerated by the volatility of prices in the present geo political situation. Upskilling technical manpower will be needed to maintain relevance. Steps toward building a pool of technically competent and skilled manpower that can adapt to Technology and curate process and efficiency improvements are much needed. The importance that is given to this issue in Singapore can be gauged by the fact that the Civil Aviation Authority of Singapore (CAAS) has a designated Singapore Aviation Academy as its official Training Arm. India must develop Vision and implement transparent policies to ensure that the growth of skilled pool of engineers and technicians is well looked after. This, of course, has to go hand in hand with the policy changes needed to ensure the survival and sustenance of MROs in India.

About the Author

Cdr Amogh Warhadpande (Retd) served in the Indian Navy for 24+years as a Naval Aviation specialist. He is an alumnus of the National Defence Academy, Pune, Naval Engineering College (B Tech), Indian Institute of Technology Madras (MTech, Controls and Instrumentation) and Faculty of Management Studies, Delhi University (MBA).He is a certified PMP from PMI, USA.

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SOARING HIGH

Economics of Inflight Magazines

Abhishek Nayyar
Correspondent
100 Knots

Imagine being suspended thousands of feet above the ground, soaring through the clouds as you embark on an adventure. In these moments, time slows down, and the world feels both expansive and intimate. Amidst this unique setting, one often finds solace and entertainment within the pages of an inflight magazine. With their captivating articles, stunning visuals, and curated content, these magazines have become an essential companion for travelers, transforming the experience of air travel.

Cultural Kaleidoscope

Inflight magazines in India showcase the country's vibrant cultural tapestry. They offer a window into India's rich history, diverse traditions, and regional peculiarities. From articles highlighting ancient architectural wonders like the Taj Mahal to in-depth explorations of colorful festivals like Holi and Diwali, these publications provide travelers with an insightful glimpse into India's cultural ethos. Such features help passengers gain a deeper appreciation for the destinations they are visiting or passing through.

Destination Discoveries

One of the primary objectives of inflight magazines is to inspire travelers to explore new destinations. In India, these magazines play a vital role in promoting domestic tourism by showcasing lesser-known gems alongside popular tourist spots. Travel guides, itineraries, and personal stories introduce readers to the country's diverse landscapes, ranging from the serene backwaters of Kerala to the majestic Himalayan peaks of Ladakh. They provide invaluable insights into must-visit attractions, local cuisine, and off-the-beaten-path adventures, encouraging passengers to embark on memorable journeys across the country.

Culinary Chronicles

India's inflight magazines recognize the country's reputation as a food lover's paradise. They embrace the rich culinary heritage by featuring articles on regional delicacies, food festivals, and renowned street food hotspots. From savoring traditional biryanis in Hyderabad to indulging in aromatic curries in Rajasthan, these magazines showcase the diverse flavors that make Indian cuisine truly remarkable. The inclusion of recipes, chef interviews, and restaurant recommendations allows passengers to embark on gastronomic adventures both in-flight and on the ground.

Captivating Content

Beyond travel and culture, inflight magazines in India also encompass a wide range of captivating content. Lifestyle features cover topics such as fashion, wellness, art, and design, offering passengers a dose of inspiration and entertainment. Interviews with prominent personalities from various fields provide valuable insights into Indian achievements in areas like cinema, literature, sports, and business. Engaging puzzles, quizzes, and horoscopes add a touch of amusement, ensuring a well-rounded reading experience.

Evolution

Inflight magazines have come a long way since their inception. Pan American World Airways launched the first in-flight magazine sometime around 1952. Their Boeing 314 Clipper aircraft was mentioned in the title, "Clipper Travel." The longest-running in-flight magazine, KLM's Holland Herald, was first published in January 1966; ten years later. As new airlines started launching them one after another, in-flight magazines started to boom in the 1980s. To this day, over 150 in-flight magazines are being published.

Popular Magazines Today

Several inflight magazines have garnered recognition and acclaim for their high-quality content, design, and overall reader experience. While opinions may vary, here are a few inflight magazines that are widely regarded as among the best in the world:

Open Skies

Emirates

Discovery

Cathay Pacific

Sky Magazine

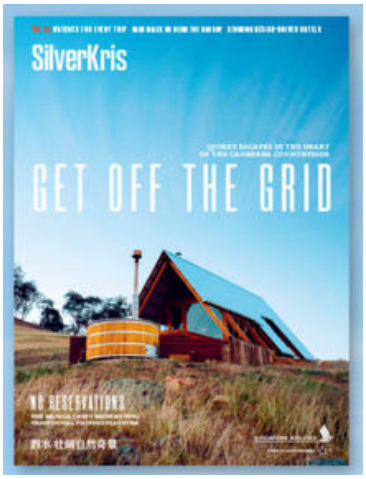
Delta Airlines

Qantas Magazine

Qantas

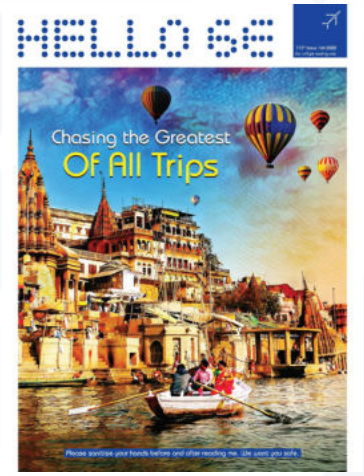
SilverKris

Singapore Airlines



Inflight Magazines in India

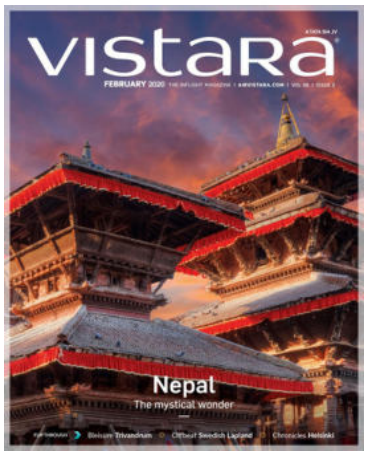
In India, there are several notable inflight magazines that are recognized for their content, design, and overall reader experience. Here are a few of the best inflight magazines in India:



Hello 6E
Indigo

SpiceRoute
SpiceJet

Shubh Yatra
Air India



Vistara
Vistara

Go Getter
Go First

Travel 360
Air Asia

Past Magazines

JetWings
Jet Airways

Hi!
Kingfisher Airlines

Air India's New Inflight Magazine
Air India and BurdaLuxury, one of Asia's leading media companies, have announced a partnership to bring innovative, quality content to Air India travellers through the relaunch of Air India's in-flight magazine in mid-2023.

The Economics

Advertising Revenue

Inflight magazines rely heavily on advertising as a significant source of income.

Circulation and Distribution

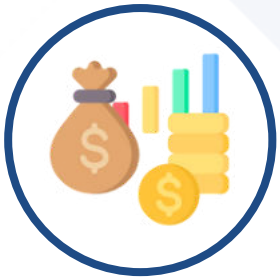
Inflight magazines are distributed directly to passengers during their flights free of cost resulting in increased exposure and potential.

Passenger Experience and Loyalty

By providing high-quality content, engaging articles, and relevant information, inflight magazines can create a positive association with the airline, increasing customer satisfaction, loyalty, and potentially influencing future travel decisions.

Partnerships and Sponsorships

Inflight magazines often establish partnerships and sponsorships with brands to provide exclusive content, special features, or branded sections within the magazine. Such partnerships provide additional revenue streams and enhance the overall content and value proposition of the magazine.



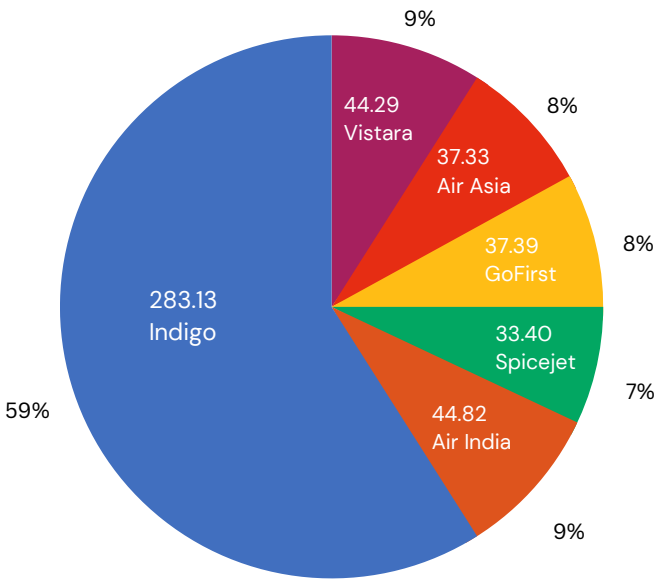
Ancillary Revenue Opportunities

In addition to traditional advertising, inflight magazines may explore ancillary revenue opportunities. This can include selling special edition publications, branded merchandise, or partnering with advertisers to offer exclusive discounts or promotions to readers.

Inflight Magazine Market in India

In India, the inflight magazine landscape has evolved significantly over the years, reflecting the diverse culture, rich heritage, and dynamic growth of the country's aviation industry. The economics of inflight magazines can vary based on factors such as airline size, regional market dynamics, readership demographics, and industry trends. The successful management of revenue streams, cost optimization, and providing a compelling reader experience are crucial for the long-term sustainability and profitability of inflight magazines.

Monthly Passengers (in Lakhs)



Airline	Magazine	Periodicity	Readership	Size	Cost
Indigo	Hello 6E	Monthly	65,78,000	Full Page Colour	10,00,500
SpiceJet	SpiceRoute	Monthly	14,00,000	Full Page Colour	6,00,000
Vistara	Vistara	Monthly	15,00,000	Full Page Colour	6,50,000
Air India	Shubh Yatra	Monthly	15,00,000	Full Page Colour	7,50,000
Go First	Go Getter	Monthly	12,00,000	Full Page Colour	6,00,000
Air Asia	Travel 360	Monthly	10,00,000	Full Page Colour	5,75,000

	Indigo	Air India	SpiceJet	GoFirst	Air Asia	Vistara
Ad Rate	1000500	750000	600000	600000	575000	650000
Avg No. of Flights Per Month	48005	8103	5801	5541	5892	7203
Avg Seat Capacity	180	180	134	183	180	158
Avg Occupancy Rate	0.744	0.783	0.789	0.765	0.679	0.737
Avg No of Pax	134	141	106	140	122	116
Approved CPR in INR	0.05	0.22	0.24	0.21	0.20	0.20

According to the International Air Transport Association's (IATA) 2019 survey:

- Approximately 77% of passengers read in-flight magazines during a journey.
- Passengers read in-flight magazines for 15 to 20 minutes on average.
- The adverts in these periodicals were beneficial or instructive to around 40% of the readers.

According to Global Passengers Survey, about 52% of readers could recall inflight magazine advertisements.

In certain cases, airlines may outsource the production of their inflight magazine to specialized publishing firms. These firms handle the editorial content, design, and advertising sales. The publishing firm often earns revenue through advertising sales and a service fee from the airline. This arrangement allows airlines to focus on their core operations while benefiting from professional expertise in magazine production.

Opportunities and Innovations

Future of Inflight Magazines

Despite the limitations, there are several chances for expansion and innovation in in-flight magazines. Leading airlines across the globe are tapping into the potential of digital in-flight magazines to engage passengers with interactive content.

The use of augmented reality (AR) and virtual reality (VR) experiences, personalized content suggestions, and strategic collaborations can improve the reading experience and give passengers unique value. Artificial intelligence (AI) has the potential to shape the future of digital in-flight magazines. AI systems may deliver highly personalized recommendations and content suggestions by analyzing passenger preferences, behaviors, and historical data. AI-powered chatbots can also provide passengers with real-time support, addressing questions and improving the overall reading experience.

Conclusion

Inflight magazines have transformed the way we experience air travel. Whether it's discovering a new travel destination, exploring a different cuisine, or learning about an innovative idea, these publications spark curiosity and encourage readers to embrace new experiences. They cultivate a sense of wonder and curiosity, reminding us that the world is full of endless possibilities waiting to be explored.

Inflight magazines in India have evolved from mere onboard distractions to valuable resources that enlighten, inspire, and entertain passengers. They provide a delightful blend of travel-related features, cultural insights, and engaging content, fostering a deeper understanding and appreciation of India's diverse tapestry. As India's aviation industry continues to soar, inflight magazines will undoubtedly continue to play a crucial role in enhancing the travel experience and promoting the country's destinations, culture, and brands to an eager audience of explorers and dreamers at 30,000 feet.

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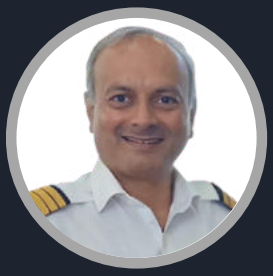
Dilemma of Pilot Retention & Business Relevance

Indian Helicopter Operations



Capt. Peeush Kumar
TRE H145

Titular statement is a realistic concern for many Indian helicopter operators of present times. Post COVID-19, pilots' shortage has put such operators under stress. The trend subtly showed up even during pre- 'COVID19' period through increased outflux of veteran pilots to fixed wing sector and non-flying jobs. Maturing to level of a concern now, ongoing helicopter business expansions and projected rise in pilots' demand in fixed wing sector presents a double whammy. Draft amendments in regulations for licensing of pilots from armed forces hasn't helped the cause of this alarm. Only agile, adaptive operators are therefore likely to retain best cockpit talents in immediate future advantaging over those resistant to change.

Cockpit talent is critical for any operators' business and repute in aviation domain. Indian helicopter industry constitutes a lion's share of veteran pilots from Indian armed forces. The incoming generation of helicopter pilots is however, a 'fresh outlook' community. This outlook is influenced by drifting social priorities, shrinking compulsions for compromises by pilots and enhanced awareness of quality working environment. Emerging picture justifiably claims the need of flexing operators' prevailing HR policies. Prevailing HR policies/frameworks could have worked satisfactorily in yesteryears, but the developing Indian socio-professional domain needs to be absorbed with agility.

Weightage assigned to cockpit talent in aviation business are notable in illustrations of succeeding paras. These references offer an inclusive global perspective on the mainstream argument of attracting best possible talents for a profitable aviation business.

Pawan Hans Limited

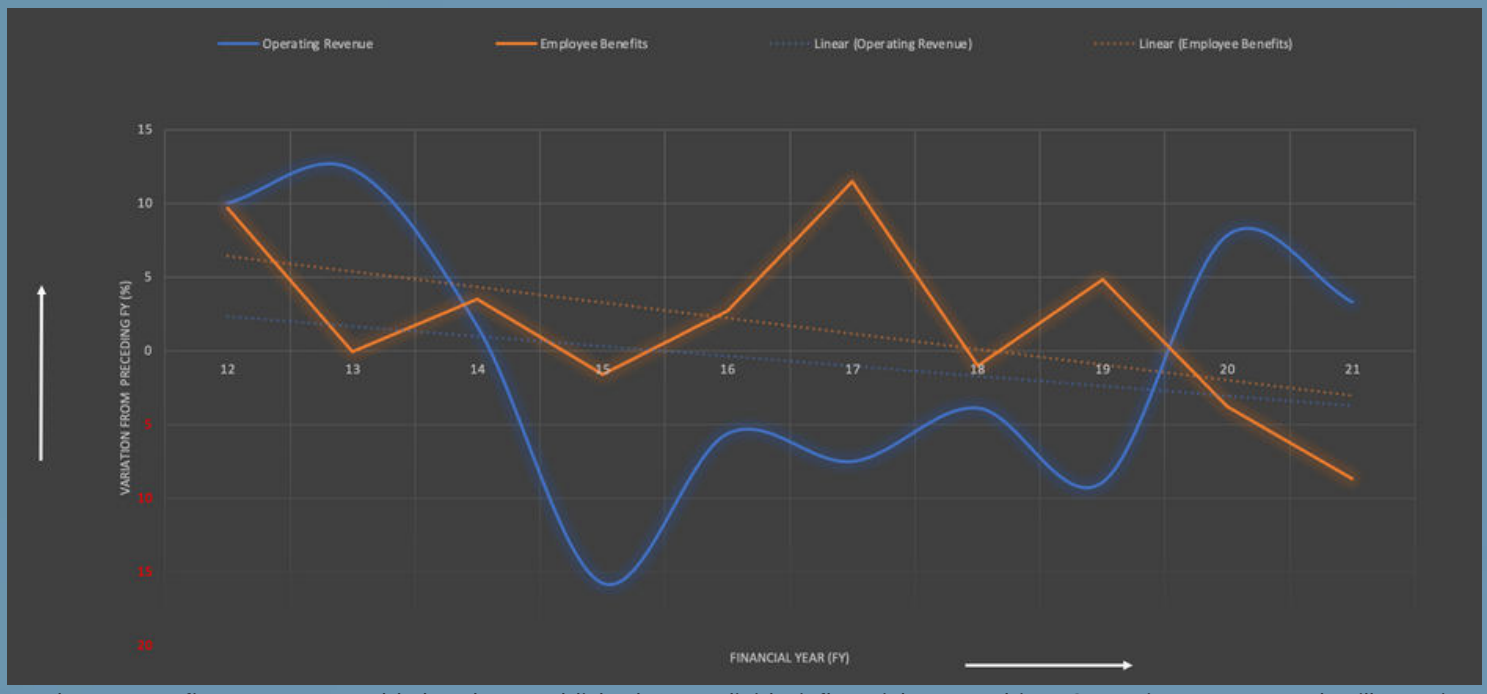
Open-source financial data of Pawan Hans Limited, an Indian public sector undertaking is available on its official website at https://www.pawanhans.co.in/english/inner.aspx?status=2&menu_id=83. Data points for 'Operating Revenue' and 'Employee Benefit Expenses' (both terms reproduced from originator's sheets) are presented on a Financial Year (FY) time line from FY ending 2012, to FY ending 2021.

Dotted/broken lines in respective colours indicate overall trends, and solid lines connect data points extracted from company's website documents. The vertical axis depicts percentage variation from preceding FY of 'Operating Revenue' and 'Employee Benefit Expenses' against time line on horizontal axis. The dependent variable of 'Operating Revenue' influenced by 'Employee Benefit Expenses' is a noteworthy element.

Understated is implicit: -

- Both 'Operating Revenue' as well as 'Employee Benefit Expenses' have been in a decline during considered period – *Refer Dotted/broken Trendlines*
- In considered years, 'Operating Revenue' has followed rise/fall of 'Employee Benefit Expenses'. It's significant that the relationship is not the other way around i.e., a fall/rise in employee benefit expenses has correspondingly impacted operating revenue during succeeding FY and not in the reverse order – *Refer Solid lines*.
- Assisted by vertical grid lines in background, trailing 'Operating Revenue' behind 'Employee Benefit Expenses' could be observed with following examples. A decline in employee benefit expenses between FY ending 2012 & 2013 is followed by declining operating revenues of FY ending 2013 & 2014. Major increment in employee benefit expenses during FY ending 2015 to 2017 positively influences the 'bottomed out' operating revenue in a five-and half-year period. Trailing rise and its peak are available during FY ending 2019-2020.

OPERATING REVENUE VS EMPLOYEE BENEFIT EXPENSE OF PAWAN HANS LIMITED



'Employee Benefit Expenses' could thus be established as explicitly influential on resulting 'Operating Revenue'. The illustration endorses indisputable relationship of general employee satisfaction with business growth.

Helicopter Association International (HAI)

HAI is a US based organisation providing support, services and setting industry safety guidelines for international helicopter community. During a webinar by HAI@Work in Aug 2022 titled '*How to Attract and Retain a Quality Workforce*', interesting experiences were shared by CEO of a helicopter company; https://www.youtube.com/watch?v=F9AnOTc9lGw&list=WL&index=3&t=4034s.
Excerpts bulleted below with inferences in italics: -

- Quality check during the company's recruiting adopted metrics of job experience, learning aptitude and a consideration about who would a candidate interact while on the job – *Company's management in example consciously demands and compensates for work experience, shoulders individual career growth and is cautious about quality of client interface by its pilots.*
- The company spent about $60,000 during towards on-boarding and off-boarding procedures – *Following an employee leaving the company, cost of advertisement, recruitment and consequential transitional dip in revenue for resultant hiring are some contributors. This is a shrinkable cost through employee retention. It is significant that this new company of about five years, operating single engine helicopters with about 70-odd employees doesn't overlook the aspect of talent retention.*
- Company's CEO brought out statistics indicating that 22% of employees left a company because of bad bosses while 72% left due to minor irritants of workplace – *It is indispensable to provide employees ease of administrative procedures, right equipment, tools and consistent support to perform. Ensure they feel safe while performing a job and above all, paid fairly.*

Bristow Helicopters

Bristow Helicopters on its website claims to operate a fleet of approximately 226 of the industry's most modern aircraft with latest generation technology and safety features. Alan Bristow started Bristow helicopters in 1955 with a dream to create a vertical lift service company unlike any other in the world. It is stimulating to uncover elements of employee morale and motivation noted in '*Alan Bristow, Helicopter Pioneer, The Auto-biography*' albeit in a lighter context. Quoted below.

"...Outside duty hours we had company parties, Christmas parties, celebration of events, we even had a social club inside Bristows building at Redhill, which helped to foster a sense of company loyalty. It was a happy hour place, with darts, snooker and table-tennis – it showed that we weren't puritanical about drinking and enjoying yourself, we simply won't countenance it when you were working....

...In fact, it was always said that the first thing Bristow Helicopter's employees did when started to start a new contract, be it in a jungle or desert, was to build a bar....."

Bristow still adheres to its existential philosophy pivoting on its people. Screenshotted below from https://www.bristowgroup.com/about the company's motto displays a depth more than could be stated in words.

Vertical (Periodical)

Published 10 times in a year, the 'Vertical' periodical provides a frontline, in-the-air, on-the-ground perspective with stories from some of the leading writers in the helicopter industry. There are subject relatable quotes at https://verticalmag.com/features/does-the-helicopter-industry-have-a-people-problem/ that echo workforce demands of quality working environment, sensitivity to employee care and a fair, dignified remuneration. Reproduced as under: -

- *"There is no helicopter pilot shortage, there is a pay and quality of life shortage that drives away qualified and experienced helicopter pilots," wrote one. "If helicopter companies paid a low six figure wage (sic), certainly what someone with the experience and skills to operate complex helicopters is worth, then a lot more pilots would choose the industry, especially military pilots."*
- *"If you don't believe that you can be competitive alone with salary, then you're going to need to get creative with your benefits," McKay advised operators. "Identify things that your employees want that are outside of the salary discussion — maybe it's a student loan or repayment program while they're working with you, or the hours. See what kind of vacation time they want, start really identifying what benefits your employees really find the most valuable and then start ramping those up."*
- *UND's research on the fixed-wing market — where it costs a lot less to get certifications and ratings — found that prospective pilots make a consumer decision when choosing their career. "They absolutely weigh the risk, which is the cost and time and effort; versus the reward, which is the future employment opportunities," said Higgins. "If they're doing it on the fixed-wing side, there's no doubt they're going to do the same thing on the rotorcraft side. And . . . the cost of training is staggering, absolutely staggering. I do think that that is a critical problem."*
- *Matt Zuccaro, HAI's president and CEO, agrees that the issue facing the industry today is a shortage of experienced pilots rather than an aggregate number of rated helicopter pilots*

Indian Air Force

Back home too, employees' treatment isn't an overlooked cause. On taking over as the Chief of the Air Staff, Air Chief Marshal N.A.K. Browne gave the Indian Air Force (IAF) a vision statement "People First, Mission Always".

Developing bias of veteran pilots towards non-piloting jobs for a comparable remuneration at MNCs indicates the obvious; being a pilot is just any job in present times. Glorified edge of Indian helicopter sector over non-piloting jobs has shrunk in size and quality. Workforce inflow is on a thin ice banking on those with pure passion for flight, individual compulsions or misinformation follies.

Preceding practices rendering previous results isn't a misnomer. It won't do good to helicopter sector talent if operators continue on past templates. A ball park comparison of pilots' compensation of present times with that from fifteen years in the past adjusted for inflation, emerging opportunities and social changes is a reasonable sounding board to level up value-oriented remunerations. A veteran pilot from armed forces now seeks quality of working environment, work-life balance, professional growth, rewards and a fair treatment from their employer.

The idea of human resource as primary to yield business mandates is readily adaptable in Indian civil helicopter sector. Armed forces veterans in leadership and middle management roles are plenty in India which can help the cause of quality human resource valuation. A demand to trigger this shift is adequately visible amongst helicopter pilot community. It's simply the spirit of 'People First' that does good to aviation business. Minor realignments in HR policies like as stated below could help a 'course' correction: -

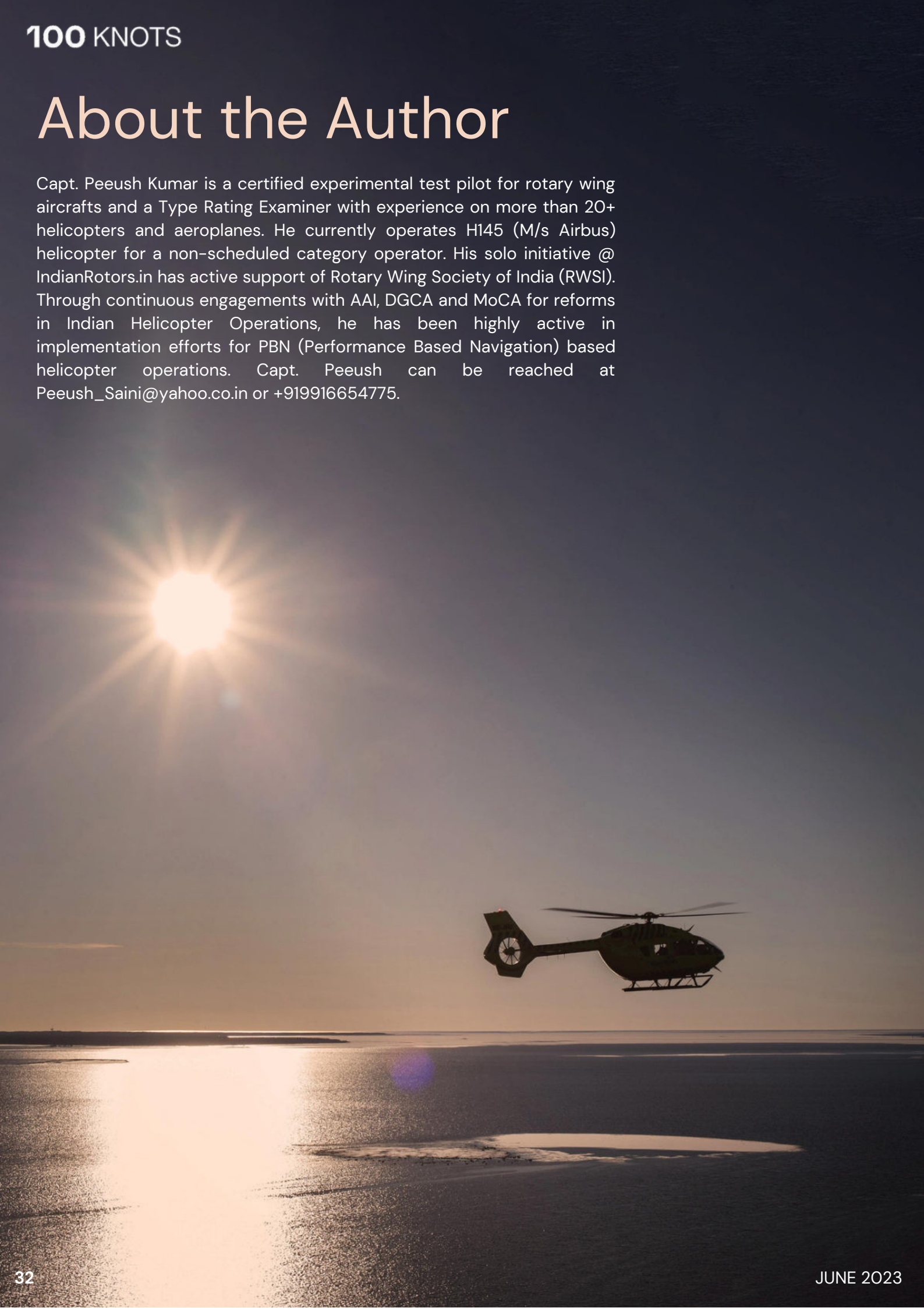
- Acceptance that a job necessity for armed forces veteran pilots is no more a 'survival' or 'standard of living' leverage. Pilots are known to have quit operators due to toxic culture, discriminatory & colonial mindset of Indian management.
- Comparison with peers induces better satisfaction for attracting quality talent. Recruitment and resource pooling merits consideration of this element to support sustained profitability. Improving quality of general treatment, recognition for performers and sensitivity to social requirements of individuals are essential for competitive business prospects. Agile operators must therefore orient HR policies to match working environment quality, compensations and lifestyle of pilots with corresponding pay bracket executives of contemporary private sector.
- Finally, unreasonable terms for training bonds to recover training expenditure for 'Type Ratings' is an avoidable exploitation of pilots. A fair, transparent model would be mutually advantageous to attract and retain quality workforce for sustenance of business trajectories.

Though intangibly, cash outflows for employees' benefits in turn do return better revenues into accounting books. Argument in this writeup has been biased heavily on aforesaid examples and experienced global minds.

Contrarily, possible myopic consideration in a 'slice' of time by management may tempt cost cuttings on employee care. As aforesaid data and experiences overtly imply, it would nevertheless be most beneficial to the company's competitors.

About the Author

Capt. Peeush Kumar is a certified experimental test pilot for rotary wing aircrafts and a Type Rating Examiner with experience on more than 20+ helicopters and aeroplanes. He currently operates H145 (M/s Airbus) helicopter for a non-scheduled category operator. His solo initiative @ IndianRotors.in has active support of Rotary Wing Society of India (RWSI). Through continuous engagements with AAI, DGCA and MoCA for reforms in Indian Helicopter Operations, he has been highly active in implementation efforts for PBN (Performance Based Navigation) based helicopter operations. Capt. Peeush can be reached at Peeush_Saini@yahoo.co.in or +919916654775.



Human Trafficking

in Aviation

Radhika Bansal
Assistant Editor
100 Knots

"Something in the back of my mind told me that something was not right," Shelia Fedrick, a flight attendant working for Alaska Airlines, told reporters. "The girl looked like she had been through hell."

Fedrick was working on a flight from Seattle to San Francisco, United States, when she noticed on board a well-dressed older man travelling with a teenage girl that she said looked "disheveled and out of sorts."

Fedrick tried to speak to the pair but the girl remained silent and the man became defensive. It was at that moment that the flight attendant decided to leave a note for the girl in the restroom and instructed her discreetly to go to the restroom.

"She wrote on the note that she needed help," said Fedrick who immediately informed the pilot. Police officers were waiting at the plane's terminal in San Francisco on arrival and were able to confirm that the young girl was a victim of human trafficking.

Fedrick, who has been a flight attendant for over ten years, said the incident reminded her of her training; although she felt that she could have seen other victims without being fully aware that they were being trafficked.

"If you see something, say something"

Detailed forms of exploitation among detected trafficking victims, 2018 (or most recent)

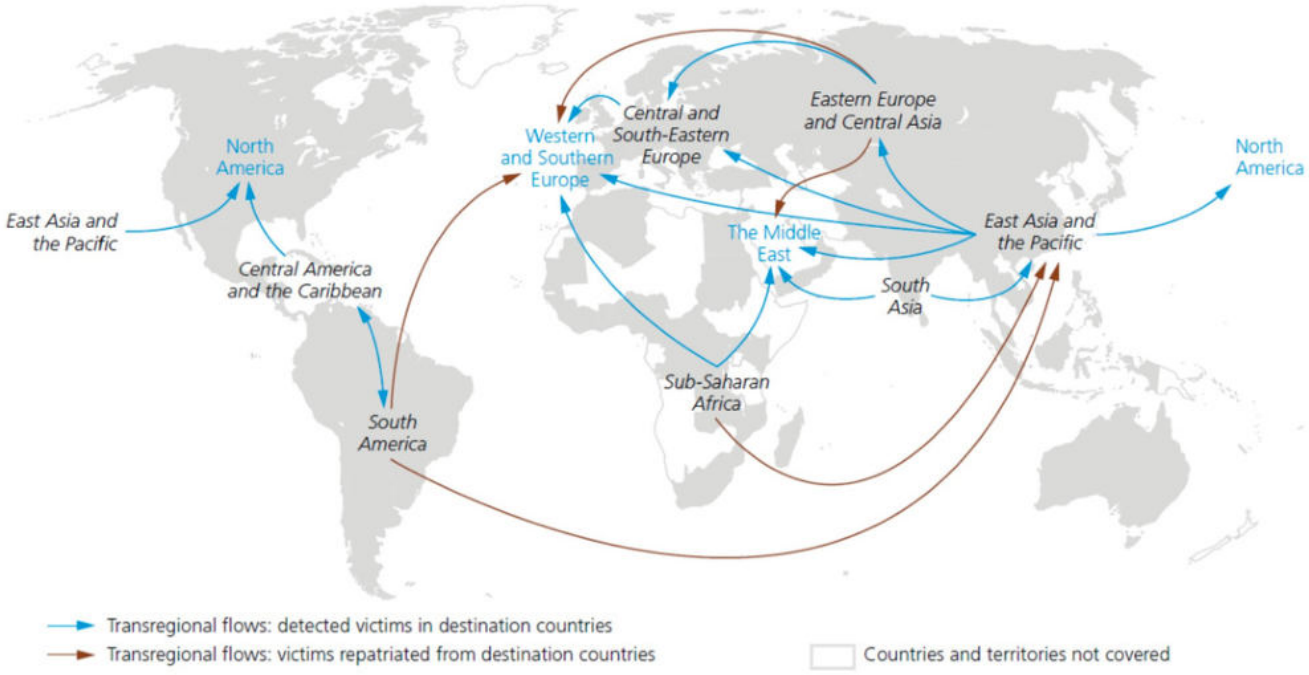
Source: UNODC elaboration of national data.

Aviation is often referred to as "the business of freedom". The global connectivity provided by airlines link businesses to markets, reunite families and friends, and facilitate tourism and cultural exchange. Unfortunately, the global air transport system can also be misused by criminals for the illegal trafficking of men, women, and children. This may involve forcing people to travel, usually with legal papers which are taken from them in advance. National borders are often crossed legally.

Human trafficking is the fastest growing and second largest criminal industry in the world. A 2022 report by the International Labour Organization (ILO), Walk Free, and International Organization for Migration (IOM) estimate that in 2021 27.6 million people were living in modern slavery. Over 60% of victims are trafficked across international borders.

Traffickers misuse the speed and efficiency of aviation to transport victims who may be traveling undetected on aircraft and through airports. In 2018 about 50,000 human trafficking victims were detected and reported by 148 countries. However, given the hidden nature of this crime, the actual number of victims trafficked is far higher. The Report shows traffickers particularly target the most vulnerable, such as migrants and people without jobs.

Data from cases that IOM assisted over the last ten years show that nearly 80% of international human trafficking journeys cross through official border control points, including airports. According to the International Labour Organization, more than 70% of the cases identified today are related to women and young girls, and more than 25% are children.



Source: UNODC.

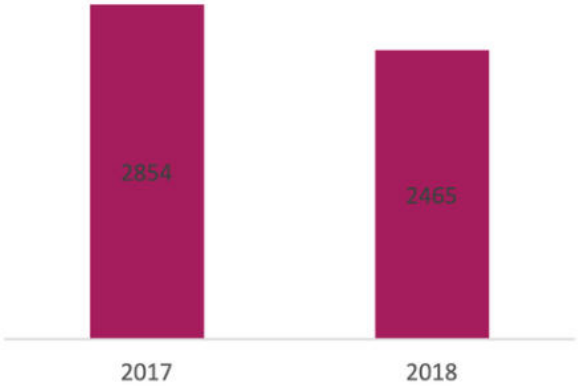
What is Human Trafficking?

The United Nations defines Human Trafficking as the recruitment, transportation, transfer, harboring, or receipt of persons by improper means (such as force, abduction, fraud, or coercion) for an improper purpose including forced labor or sexual exploitation. Different countries use different legal terminologies, but "modern slavery" includes the crimes of human trafficking, slavery and slavery like practices such as servitude, forced labor, forced or servile marriage, the exploitation of children, and debt bondage.

The Government of India recognizes that Human Trafficking is a grave crime and attaches high importance to the efforts directed at preventing and countering human trafficking.

Although the responsibility for identifying, apprehending, and prosecuting those perpetrating human trafficking rests with governments and their national law enforcement agencies, Aviation's unique nature presents many opportunities to identify and react to human trafficking, as passengers are kept under observation during the entire process, from check-in to passport control on arrival. Aviation personnel can be easily trained to recognize conspicuous behaviour and subsequently inform relevant authorities and trigger further response.

Number of cases of trafficking in persons reported, 2017 – 2018



Source: The National Crime Records Bureau, Ministry of Home Affairs.

Number of victims trafficked, by sex and age, 2017 – 2018

	2017	2018
Boys	2037	1587
Girls	1498	1247
Women	2040	2472
Men	325	482

Source: The National Crime Records Bureau, Ministry of Home Affairs.

Key Signs of Potential Human Trafficking Situations

Cabin crewmembers are in a unique situation where they can observe passengers over a certain period of time allowing them to use their observation skills to identify a potential victim of trafficking. Cabin Crew can look for the following signals:

- Is the person disoriented or confused, or showing signs of mental or physical abuse?
- Is the person fearful, timid, or submissive and do they avoid eye contact?
- Does the person show signs of having been denied food, water, sleep, or medical care?
- Does the passenger defer to another person to speak for him or her or someone who seems to be in control of the situation, e.g., where they go or who they talk to?
- Is the passenger (especially children) accompanied by someone claiming to be a parent or guardian who is in fact not related to the child?
- Is the passenger in control of his/her own travel documents?
- Does the person have freedom of movement?
- Is the passenger wearing appropriate clothing for route or destination weather?
- Is the person speaking of modelling, dancing, singing, hospitality job, etc. without knowing who will be meeting him/her upon arrival, and with few details about the job?

What to do if you suspect a case of human trafficking?

The handling of suspected trafficking is unlike other cabin safety procedures such as those relating to the handling of unruly and disruptive passengers. If the cabin crewmembers believe they have identified a victim, they are advised to then follow specific reporting procedures whether the aircraft is in the air or on the ground, being always mindful to not jeopardize the victim's and other traveler's safety. Airline staff need to be cautious and ensure they do not act on behalf of law enforcement agents.

- Always follow your company procedures. This may include:
- Cross checking the signs of possible trafficking cases with other staff to confirm suspicions
- Reporting and discussing with your supervisor
- For suspected cases on board flights, informing the pilot in command so they can determine next steps
- If at an airport, contacting police or appropriate law enforcement and reporting what you have seen

How can Authorities Help?

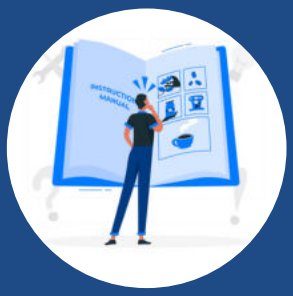
Raise awareness

Develop campaigns to raise passenger awareness of human trafficking and the possibility of reporting suspicious signs to airport staff and/or aircraft crews.

Training

States' Civil Aviation Authorities (CAAs) along with operators should develop policies, procedures, training and guidance for their employees; specifically, to raise awareness on trafficking in persons and appropriate responses to such events. Such training should include:

- Early recognition of possible signs of human trafficking
- Appropriate actions to be taken



Standard operating procedures

Develop campaigns to raise passenger awareness of human trafficking and the possibility of reporting suspicious signs to airport staff and/or aircraft crews.

Anonymity

Whether crew members are willing to report an event of suspected human trafficking is largely dependent on the perceived risks associated with reporting. Therefore, the identity of crew members reporting suspected human trafficking should not be recorded.

Reporting System

Developing procedures for suspicious circumstances observed by the flight crew, relayed by the cockpit crew to the responsible authorities via air traffic control or the operator and in similarly from ground staff to the responsible authorities.

Conclusion

Human trafficking is an appalling crime and an appalling violation of victims' rights. This is why the efforts of the international air transport sector in combatting it are so important. Detecting and managing cases of suspected trafficking in persons is not easy. However, simple, practical steps can be implemented to detect suspected victims and to report cases. Ground staff and customer-facing operators are an important source of knowledge and first assessment. However, cabin crew are in a unique position as they travel with passengers sometimes for many hours and can spot even the smallest signals and behaviors.

MRO 2027 : Indian Roadmap

Growing Indian Fleet & MRO Challenges

Pulak Sen
Founder & Secretary General
MRO Association of India

Growing Indian Airline Fleet

Airlines in India are going to add 15 percent capacity or 100 to 110 aircraft per year and the aviation sector is looking at close to 1,200 aircraft by 2027.

The largest order ever placed by an Indian carrier is that the Tata group held Air India with 470 aircraft – a mix of Airbus and Boeing types. Air India will be the first to induct the Airbus A-350 in India. Additionally, Air India has taken on lease 30 aircraft to meet the demand till it receives its aircraft.
Indigo will exercise the option on 300-500 more aircraft. Akasa Air is adding steadily to its fleet of aircraft too.

Currently, Boeing has detected several issues with the manufacturing of 737 Max aircraft which could affect the deliveries required for the fleet expansion of Indian carriers like Air India and Akasa Air. The development came after Boeing discovered that a supplier used a "non-standard manufacturing process" during the installation of the rear fuselage.

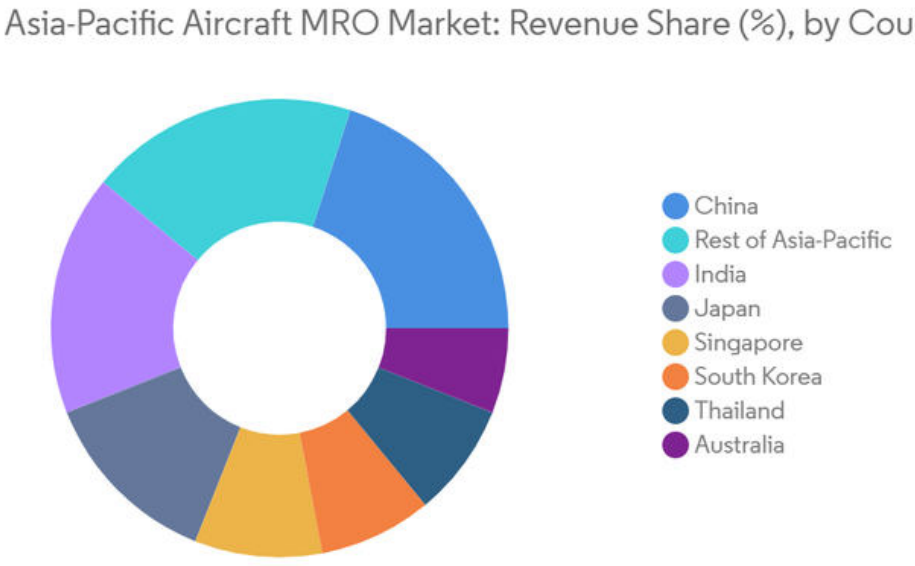
"This is not an immediate safety of flight issue, and the in-service fleet can continue operating safely. However, the issue will likely affect a significant number of undelivered 737 MAX aircraft, both in production and in storage. We have notified the FAA of the issue and are working to conduct inspections and replace the non-conforming fittings where necessary," Boeing said in a statement.

Current fleet: 714 Commercial aircraft; 17 cargo. Total: 731 aircraft
Breakdown of this fleet OEM wise: 486 Airbus types; 143 Boeing types, 62 ATRs; 28 Bombardier Q400; ERJ5; 1 E-175; 2 Caravan; and 2 Dornier 228
* These figures are of April 1, 2023

Market status of the Indian MRO industry

- The Indian MRO industry as of 2021 was worth USD 1.7 billion
- The Indian MRO industry Expected to reach USD 4 billion by 2031
- The global MRO market was USD 68.5 billion in 2021
- The global MRO demand is expected to reach USD 117 billion by 2031
- The Indian MRO industry recorded an 8.9 CAGR, compared to 5.6 CAGR globally

The next decade is for the APAC region. The APAC region will see steep growth in the next decade. The chart shows the country wise break up.



Source: Mordor Intelligence

Indian Government Initiative

The 339th Report on the Action Taken by the Government to the Parliamentary Standing Committee on Transport, Tourism and Culture on Demands for Grants (2023-24) of MoCA-furnishing of Action Taken Report. This report was presented to both houses in the Parliament on March 13, 2023.

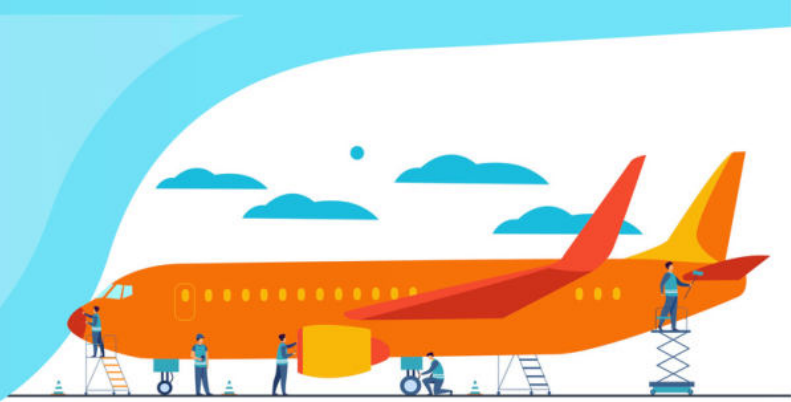
- Import Duty exempted on Special Tools and Equipment for MROs;
- Customs duty waiver that applied to spares only for Airlines extended to MRO;
- simplified clearance processing of parts;
- 100% Foreign Direct Investment (FDI) has been permitted via automatic route for MRO;
- Relaxed restrictions on utilization of duty-free parts from one year to three years;
- Aircraft brought into the country for MRO are allowed to stay from one month to six months without penalties; and
- The Place of Supply (PoS) of MRO services changed to the location of the recipient to ensure a level playing field for MRO located in India and to incentivize the setting up of MRO in India by Indian or foreign entrepreneurs.

Providing a game-changing thrust to the setting up of MRO facilities in India, the Goods and Services Tax (GST) Council at its meeting held on 14th March 2020, decided to reduce the GST rates on MRO services provided by domestic MROs with effect from 1st April 2020 as follows:

- GST on Domestic MRO services was reduced from 18 % to 5 %.
- Sub-contracted transactions to domestic MRO by foreign MRO are now treated as exports with zero-rated GST.

As a result, when foreign OEM sub-contracts work to an Indian MRO, the work done by the Indian MRO amounts to the export of services by an Indian entity to a foreign entity, attracting no tax.

Current Status of the Indian MRO Industry



With such big fleets of Indian carriers, where does India stand on the MRO front? Air India Engineering Service Ltd. (AIESL) is the largest MRO owned by the govt of India. It has six main bases, Delhi, Mumbai, Nagpur, Kolkata, Hyderabad and Trivandrum. AIESL in its bases has several capabilities from cabin refurbishment to aircraft weighing to component repairs to airframe repair to engine repair and overhaul. Apart from these bases, it undertakes line maintenance at various stations at home and overseas such as Ras-Al-Khaimah, Sharjah, Dubai and Kathmandu, all with wheel change capabilities.

IndiGo, India's largest airline, opened its second MRO facility at Kempagowda International Airport, Bangalore on November 17, 2022. The airline signed a 20-year agreement with BIAL to build a hangar of 13,000 sqm on a plot of land of five acres. The facility will be able to accommodate two narrow-body aircraft and support infrastructure including a Quick Engine Change (QEC) shop, warehouse and engineering offices. The MRO will be the airline's second venture after the one at Delhi airport, which is a smaller one.

Air Works India, India's largest third-party MRO, is certified to maintain more than 50 types of aircraft, making it also the most diversified MRO in the country with a pan-India presence in 27 locations with close to 1,500 employees. It also provides commercial aircraft asset management services, avionics, cabin and interiors solutions, 3D printing, and aircraft refinishing services apart from MRO-related offerings. Its customers include both civil (fixed-wing & rotary-wing) and military customers apart from global OEMs, commercial airlines, business aviation companies, and leading global lessors.

GMR AeroTechnik is also a third-party MRO, based in Hyderabad, with full capabilities in all departments of MRO from major maintenance to full body painting, composite repair to component repair, etc. It has narrow-body capabilities, specializing Airbus, ATR and Bombardier. Apart from Hyderabad where it carries out major maintenance, it also carries out line maintenance in Delhi, Goa and Kathmandu.

Both Air Works India and GMR perform MRO for various international airlines and possess the respective countries' Regulatory certifications, apart from FAA and EASA. AAR-Indamer Technics Private Limited is a joint venture between AAR, a major MRO of the USA, with Indamer Technics (the oldest MRO in India) to set up a Maintenance, Repair and Overhaul (MRO) facility at Nagpur.

This new joint venture plans to initially perform major checks of Airbus A320 family aircraft under DGCA, EASA and FAA approvals. All required support workshops will be part of the MRO.

The MRO business is capital-intensive and requires significant investment in - infrastructure, materials, training of manpower and technology. An airline's, expenditure in MRO accounts for 15 percent of total revenues - which is the second highest expense after fuel cost. The industry is highly regulated and holds critical importance for Indian civil aviation. Currently, the majority of the MRO services are outsourced to countries like - Singapore, Malaysia the UAE, etc., which demonstrates a huge demand and low supply model domestically. MROs infrastructure is expanding in India due to incentives provided by the government, and alliances formed by companies with foreign MROs, as noted in the previous section. Indian MROs have also started obtaining global certifications for their services. MRO is a labour-intensive industry, that depends on the availability of a skilled workforce at a lower cost to improve profitability. India holds an edge over MRO hubs like the USA, Europe, Singapore, and others as it has the availability of low-cost certified technicians.

It started last year and it will see more mergers and acquisitions of Indian MRO companies and new entrants will emerge in this buoyant sector of aviation in India. This is the trend that India will undergo for the next couple of years as the fleet size of airlines would grow.

Growth of Indian MRO Industry

The Ministry also apprised that a total of 140 MROs has been approved by the DGCA till Oct. 2022, out of which 27 new MROs were approved by the DGCA since the GST was reduced.

Keeping in view India's growing aviation market, technology, and skill base, the government announced new MRO Guidelines on 1st September, 2021 with a view to creating a congenial atmosphere in the country for the development of the MRO industry for aircraft/helicopter/drone and their engines and other parts. These guidelines inter-alia provide for allotment of land at AAI airports through the call of open tenders without levy of any royalty or cess of whatsoever nature to MRO operators. The new guidelines would further encourage the MRO organizations and OEMs to set up workshops in India and create a conducive environment towards making India a global hub of MRO.

Challenges Ahead and Skilling Workforce

With this exponential growth of the Indian commercial aviation industry, the Indian MRO industry has to rise up to the challenge in the coming time. They should not only upscale their equipment and process, but build up their logostics, and develop their own ecosystem.

Skilling & trainings for MRO industry is the need of the hour, and overseas MROs/skilling schools could participate in providing Skilling center of excellence in specific trades. Using Distance learning and Virtual training methods.

Bilateral

More opportunities can be generated if the bilateral agreement between FAA, EASA, and the DGCA on mutually accepting civil maintenance certifications can be agreed upon while negotiating and signing bilateral between the MoCA and its overseas counterparts.

Some of the OEM-MRO Collaborations

- GMR Aero technic will undertake work on the conversion of Boeing 737 passenger aircraft to freighter aircraft
- GMR Aero Technic partners with Spirit Aero as an aftermarket repair provider for nacelle components and radomes in India
- GMR to provide a 4-year AME license training programme with Airbus as the knowledge partner
- Boeing and Air Works Accelerate MRO Capabilities for the Indian Navy's P-8I Fleet – in India, for India
- Boeing appoints AIESL to do maintenance of two Boeing 777 of the VIP Squadron and the Boeing P-8i aircraft of the Indian Navy
- AIESL signs an engine maintenance service agreement with Willis Lease Finance Corporation to provide maintenance to their CM56-5b engines
- GMR Aero Technic and Kuehne+Nagel signs a three-year-long contract for aircraft maintenance logistic

Policy Support

We have our NCAP 2016 and the amendment to it, however, we now need an Aerospace Industry Transformation Map

R&D Support

- The government and the MRO Industry should invest in R&D for new technologies such as Artificial intelligence, Augmented Reality, etc
- Encourage Domestic firms to participate in developing products and services with 1:1 funding by the GOI and the firm
- Facilitate growth of a strong MRO eco-system to support the Indian MRO industry
- Develop skill-building for the Indian MRO Industry
- Last but not least, GOI to urge foreign OEM/MRO to support the development of the Indian MRO Industry by Transfer of Technology.

In conclusion, As the Indian Commercial Airline industry grows in the next decade, the Indian MRO Industry will also be commensurate with this growth, provided they invest on their own for much-needed expansion or form Joint ventures with OEMs or international MROs to face the challenges in the coming days.

About the Author

Pulak Sen is a veteran aerospace domain expert with experience over 45 years in both civil and military aerospace business. He was a member of the Tenth Planning Commission in Sub-group on Aviation. He led a group of MRO Owners/Experts to build on a Chapter on MRO In the National Civil Aviation Policy 2016 and subsequently Vision 2040 for Civil Aviation Industry released at the Global Aviation Summit 2019.

Pulak Sen founded the MRO Association of India, a Not for Profit, lobby for the Indian MRO Industry. He is the Founder & Secretary General of the Association. He is the creator of India's Only MRO Forum, India MRO Aerospace & Defence, the first International Exhibition and Conference which rolled out in 2011. He is also a Member of the National Civil Aviation Committee at Federation of Indian Chamber of Commerce and Industries (FICCI) and Aerospace & Defence Consultants Association of India (ADCAI).

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