AERO INDIA
THE RUNWAY TO A BILLION OPPORTUNITIES

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DEPARTMENT OF DEFENCE PRODUCTION
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FICCI
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Convergence of Civil and Defence MRO

Knowledge report

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Foreword

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Maintenance, Repair and Overhaul (MRO) is an essential aspect of aircraft operations. It is a complex process with stringent requirements, defined by the regulating agency of each country. Each stakeholder plays their own part; the Regulator in ensuring the airworthiness; the OEM in creation of maintenance guidelines, duly approved and adopted by the Aviation authority. MRO ensures combat-worthiness of platforms and different weapon systems. As India continues on its path of modernization of its Armed Forces through upgrades of existing platforms, induction of new state-of-the-art platforms, indigenization and a focus on 'Make in India', building the desired capability in MRO and the broader aftermarket has assumed an important role. Typically, the life cycle cost of any platform is 2-3x of the development cost and therefore offers a huge market. Today, most MRO activities in India have major foreign contribution, as all foreign origin platforms are bound by limitations of technology transfer.

This report explains the need for developing India into an MRO hub. It discusses the approach for the same. Current status of military and commercial MRO in India is also presented. The report conveys how the convergence between defence and civil MRO shall prove advantageous to the aviation industry in India.



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01 Introduction

The current aviation market in India is interspersed with approximately 2310 military and civil aircraft in operation. The number of fixed wing and rotary military engines currently flying in the country are nearly 1338 and 962 respectively. India has the potential to become the third largest aviation market over the next 3-5 years. With over 1000 aircraft currently on order, India is likely to become the third largest buyer of commercial passenger planes in the world, only behind the US and China.

The Indian Armed Forces currently have approximately 1,800 aircraft in operation. The Indian Armed Forces are on a modernization drive, resulting in the replacement of old/ legacy equipment and procurement of newer platforms/weapons systems.

India is forecasted to require an additional 1,880 new passenger aircraft by 2038, which will boost the existing fleet of around 510 aircraft to 1,950 aircraft in 2038. As a knock-on effect, it is estimated that the number of middle-class people who travel by air will double by 2038, further driving this growth for aircraft. India's Regional Connectivity Scheme which plans to open around 100 airports over the next five years, would enable more passenger traffic and an increase in demand for aircraft.

Presently, the annual revenue of Indian military Maintenance, Repair and Overhaul (MRO) services is approximated at US$6 billion. HAL has an annual turnover of ~INR 20,000 crore in which 45% (~INR 9000 crore) is contributed by MRO. This implies that 70% value addition i.e., INR 6000 crore is done in the country. The Base Repair Depots (BRDs) in the country are envisaged to be conducting at least US$1 billion worth MRO. General aviation also has nearly 250 aircraft and associated MRO.

The annual revenue of the civil MRO industry in India is US$1.2 -1.4 billion, out of which 92-93% is imports by value i.e., US$ 100-200 million or INR 1400 crore. Therefore, real value addition is 1000 crores out of which 50% contribution is by AIESL, and 50% by private industry. On the non-civil aircraft side, at least US$ 1 billion is through export route on foreign military sales (FMS) package.

Therefore, on both military and civil fronts, there is a huge foreign exchange outgo which needs to be retained in the country. This results in a case for addressing the MRO sector through a special government scheme to encourage, establish and sustain MRO activities in India.

MRO services will create employment for around 50,000 people/staff, while the indirect employment multiplier could be estimated at 4x-5x, which equates to indirect employment opportunities for around 200,000 to 250,000 people. However, while India does have access to good engineering and technically qualified talent, the challenge arises in ensuring that these personnel are certified to meet demand.

Aerospace MRO involves interaction and engagement with various OEMs even for a single platform, airframe, engine, components, electronics, and specialized equipment. While engine MRO is recommended to be the first line of investment, component MRO has the potential of generating more jobs and boosts the small industry sector. They would come in numbers each with niche capabilities. Industrial growth will naturally look outward for exports of services and result in huge savings in FE outgo.



02
Approach

India maintains a geographic advantage in the South Asia region to not only cater to its own domestic demand from Indian carriers, but also target MRO work from neighbouring countries. Finally, a key advantage of India is an overall lower cost of labour, which translates into a lower cost of operation for the MRO service provider.

India can look at targeting countries which operate the same/similar platforms. For instance, given India's current capabilities for manufacturing of the Su-30MKI, an opportunity could be to look at providing MRO services for the other Air Forces using Su-30MKM including engine overhaul, or supply of spares. These include the Algerian Air Force, Angolan Air Force, Armenian Air Force, Belarusian Air Force, Indonesian Air Force, Kazakh Air Force, Ugandan Air Force, Venezuelan Air Force and Vietnam People's Air Force.

India can target MRO services for the platforms (new) and existing platforms that are already in service. OEMs could see India as a regional MRO hub for their customers of the same platform in the South Asia/Southeast Asia region.

With indigenously designed and developed platforms such as the LCA targeting new geographies for export, India should also look to export its MRO services. This would allow India to effectively offer customer nations an end-to-end offering over the useful life of the platform. This would help to target the export market through a different avenue, while also ensuring that India retains regional MRO hub status for the platform.





03 Types of MRO

There are three types of MRO namely airframe, engine and component.

Airframe	Engine	Component MRO
Airframe MRO is any kind of maintenance, repair or overhaul activity that is conducted on the airframe of the aircraft. This includes aerostructures, avionics upgrades, and any Line Replaceable Unit (LRUs) changes.	Engine MRO is associated with any replacements, upgrades or required maintenance associated with the aeroengine.	This focuses on smaller components on the aircraft and includes items such as components related to the hydraulic system, pneumatic system, fuel system, electrical system, etc.

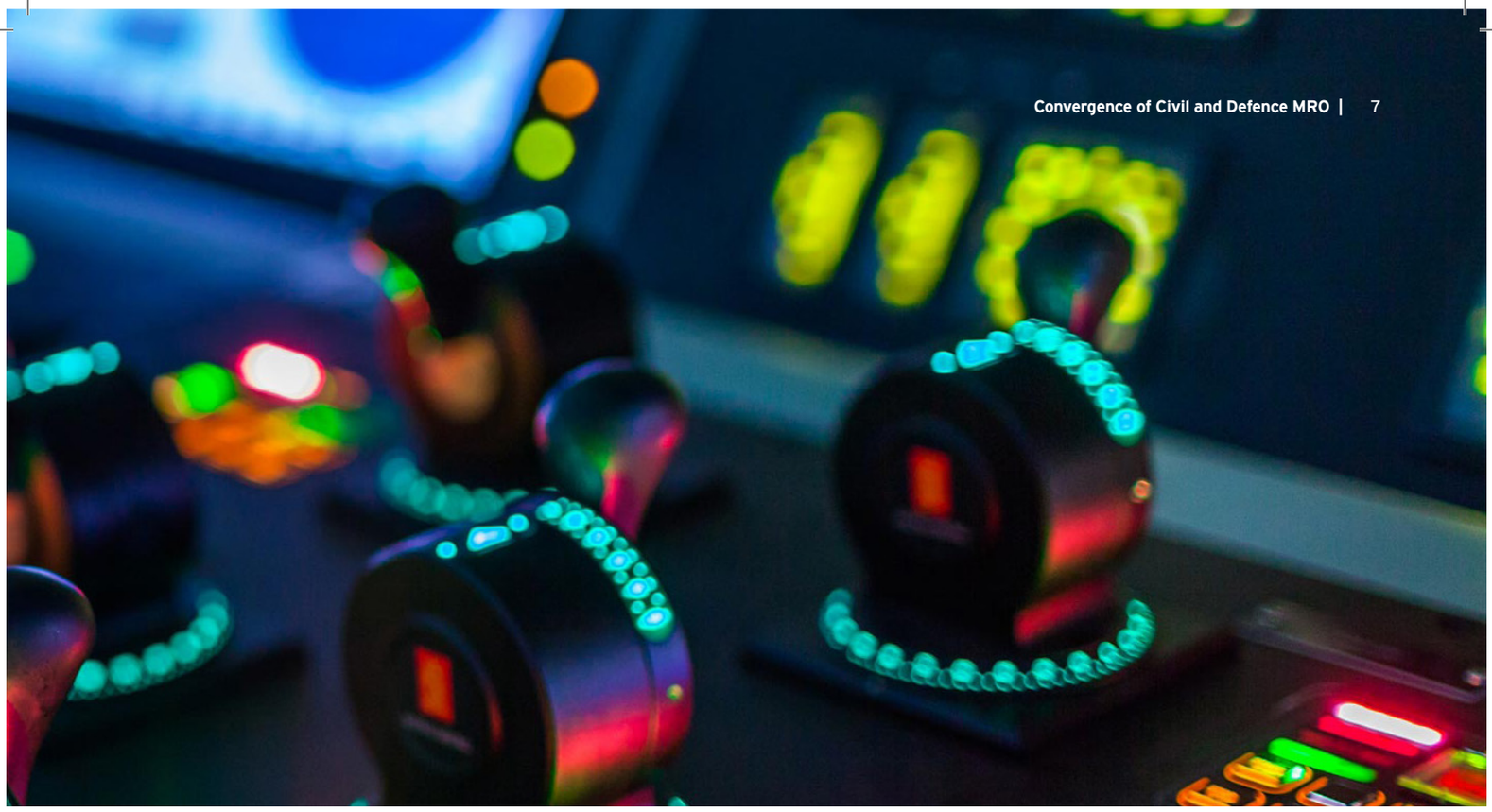
The approximate cost of each type is tabulated as under:

MRO type	Labour cost (%)	Spares cost (%)
Airframe	80	20
Engine	20	80
Component	40-50	50-60

Line maintenance is also a type of maintenance that is in form of scheduled and unscheduled inspection on the tarmac. This could include checking of fluid levels, emergency equipment, inspection of wheels and brakes, along with a general visual inspection of the aircraft structure, and engine for evidence of any kind of damage, deformation, etc

The maintenance of equipment can be broadly structured on three different levels, with each level defined by the means and resources used to carry out specific maintenance/repair activity. The repair philosophy that is followed by the Services can be categorised into 'O', 'I', and 'D' levels.[1]

1 'Draft DPP 2020 ' Chapter 2-Acquisition Procedures https://mod.gov.in/sites/default/files/DraftChIIAcqnProcedure.pdf



'O' Level

O level maintenance includes unit and field repairs at the 1st and 2nd level.

Unit repairs

These are repairs carried out within the unit or supplied by the manufacturer with each equipment. The repairs cater to cleaning, lubrication, minor repairs, and replacement of components and minor assemblies including LRUs, that can be carried out within the unit without any sophisticated tools or test equipment.

Field repairs

These are repairs carried out at the field/flotilla/station level or equivalent service organization by technicians specially trained for this purpose and where the required special tools and spares have to be provided additionally for the class of the equipment. These repairs comprise replacement of common Line Replaceable Units (LRUs), sub-modules, other components beyond the holding of units and repairs undertaken beyond a unit level. Normally, a field/station workshop that carries out such repairs looks after a group of units holding the said class of equipment.

'I' Level

This level of maintenance Includes 3rd level Intermediate Repairs by Corps Zone workshop/Dockyard/Base Repair Depot or other similar service organization. These are extensive or special repairs carried out for equipment to reduce the down time and would include component level repairs. This level of repair envisages special diagnosis and repairs of the repairable inventory up to Printed Circuit Board (PCB) level, major assemblies, interface equipment/software and other components beyond the scope of field/flotilla/station level repairs. These repairs are carried out in the designated workshops by technicians specially trained for this purpose and where the required special tools and spares would be provided.

'D' Level

This level of maintenance includes 4th level extensive Base overhauls, Depot level Repairs which are either routine and planned or necessitated due to major repairs/renewal requirements. Post such repairs, detailed trials are conducted usually by the overhauling agency, prior to handing over of the equipment to the unit for operational exploitation. This level of repair defines stripping and rebuilding of equipment in a Base workshop or any other designated workshop. Extensive repairs of components / sub-assemblies and overhaul of the complete equipment is carried out by this facility and due to the complexity requires specific technical knowledge, infrastructure, related documentation, experience and proper quality control.

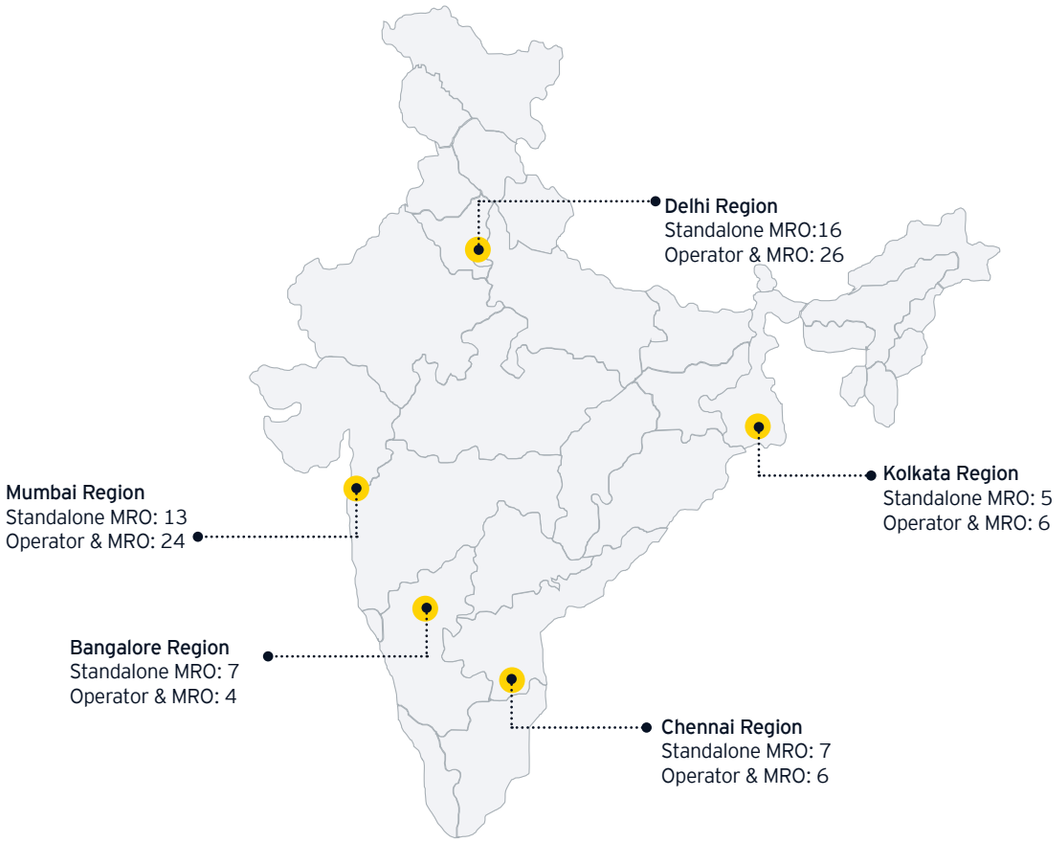


04 MRO in India

Commercial Aerospace MRO Ecosystem

India at present has around 114 approved facilities (under CAR145), can be seen from the diagram below:

Figure 1



Source: DGCA list of CAR145 approved organizations & EY Analysis



Regional capability[2]

Bengaluru

Within the Bengaluru region, MRO service providers capability is primarily present in the airframe MRO and component MRO segment. From a commercial aviation specific standpoint, this capability is reliant on Airworks India's MRO facility (Hosur) which has the capability to conduct airframe maintenance on Airbus A320s, Boeing 737s, and ATR42/72 turboprops. Capability in this region is also supplemented by Air India Engineering's presence in Thiruvananthapuram where major airframe checks, wheel and brakes overhaul etc., are conducted for Boeing 737 aircraft.

Chennai

Within the Chennai region, MRO service providers capability is present in the airframe MRO and component MRO segment. From a commercial aviation specific standpoint, capability exists in the airframe and component segment. Within the airframe segment, capability can be seen through GMR Aero Technic which caters to the Boeing 737s, Airbus A320s ATR42/72, and Bombardier Q400s, along with SpiceJet Technic which caters to the airframe segment for Boeing 737 and Bombardier Q400 fleet types. Capability in this region also exists through Air India's facility in Hyderabad for conducting C-level checks for Airbus A320 aircraft. In the component MRO segment, capability for commercial aviation is seen through MRO service providers such as SpiceJet Technic, Turbo Jet Engines Private Limited amongst others. Turbo Jet Engines Private Limited (Telangana) caters to Airbus A320, Boeing 737, ATR42/72, Bombardier Q400, Embraer E170, E190 fleet types in providing component MRO services with regards to wheels and brakes, oxygen systems, and avionics equipment.

Kolkata

Within the Kolkata region, capability for MRO services is primarily focused on component MRO, with a focus on overhaul and repair of propellers. Component MRO capability is primarily seen through MRO service providers such as Arrow Aviation Services Private Limited (New Delhi), NSCB Aviation Private Limited (Kolkata), and the Aerospace Research and Development Center in Guwahati. Air India Engineering Services Limited (AIESL) also has a presence through its facility in Kolkata where major airframe checks for Airbus A319 or A320s aircraft are conducted. The AIESL facility in Kolkata further supplements the component MRO capability with a component overhaul capability that exists for auxiliary power units for the A320 family, high-flow pneumatic components, and fuel accessories.

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2 https://dgca.gov.in/digigov-portal/?page=jsp/dgca/InventoryList/aircraft/maintenanceOrgs/MROs.pdf & EY Analysis



Mumbai

Within the Mumbai region, capability for MRO services is spread across aircraft. For airframe MRO segment, there is capability seen through Airworks India which caters to Airbus A320, Boeing 737, and ATR42/72 fleet types. AIESL's Mumbai facility does airframe MRO on Airbus A330, Boeing 737, 777, 747, 787 fleet types. The facility also conducts component overhaul (example includes APU overhaul) and engine overhaul (engine MRO) on the Boeing 777, 787, 747, 737 fleet types while conducting engine overhaul on engine models including PW4056/4152, CF6680C2, CFM56-7B, and GE90.

Capacity and infrastructure will be further substantiated with the setting up of AAR-Indamer Technics (JV between AAR and Indamer Aviation) MRO facility in Nagpur which will add to the region's capability in terms of the airframe MRO segment for the narrow-body segment (Boeing 737, Airbus A320). In addition, capability exists through AIESL's facility in Nagpur which conducts airframe MRO for Boeing 777,737, and Airbus A320 fleet types along with component overhaul for the Boeing 777.

Delhi

Within the Delhi region, capability for MRO services is primarily seen in the airframe, engine, and component MRO segments. The airframe and engine MRO segments are primarily seen through Bird Execujet Airport Services Private Limited and AIESL. In the component MRO segment, some players in the region are Interglobe Aviation Private Limited, Indamer Aviation. Air India Engineering Services Limited provides MRO for Airbus A330 and Boeing 737 aircraft, while also conducting engine overhaul for the IAE V2500, JT8D, and CFM56-5B engine models.

From the private sector major players substantiate the infrastructure and capacity within the country:

GMR Aerotechnic: Line, Airframe maintenance for commercial aircraft including B737, A320, Q400, ATR

Airworks India: Line, Airframe Maintenance (incl. C-level checks on ATRs, A320, B737 fleets)

Indamer-AAR Joint Venture: Will conduct airframe maintenance onboard Boeing 737 and A320 aircraft

Max Aerospace: Max Aerospace is primarily involved in Component MRO through its joint venture with Air France (Max MRO Services Pvt. Ltd.)

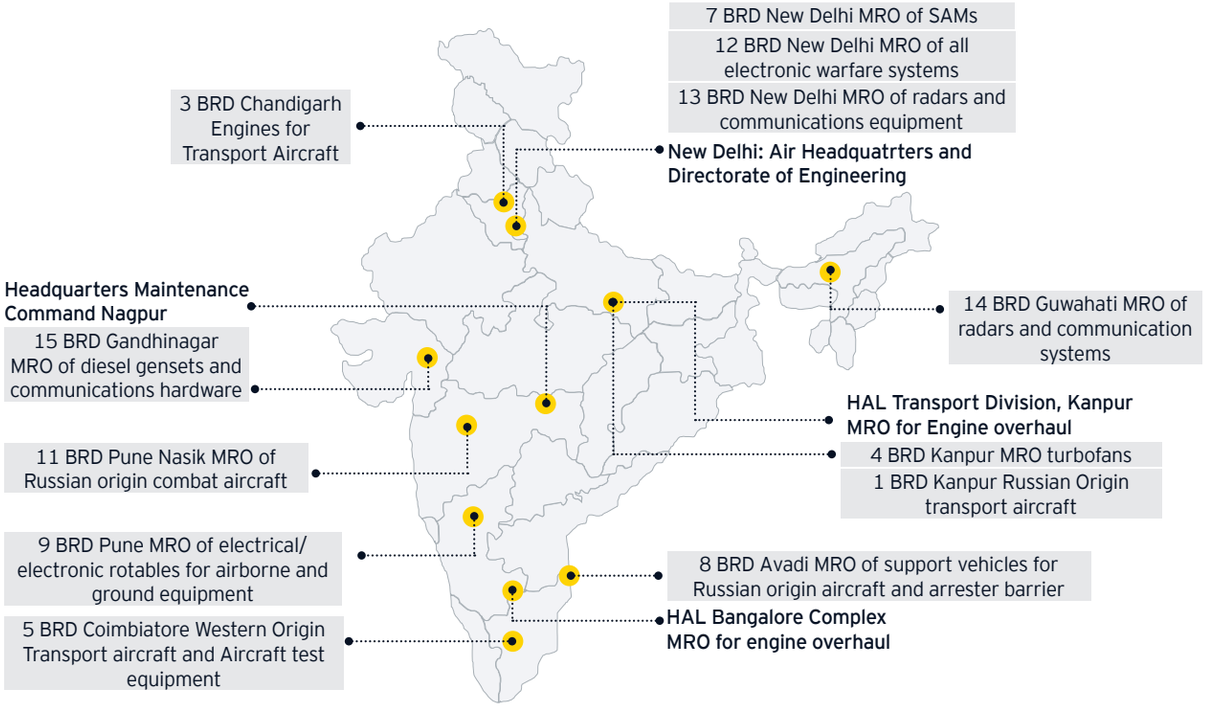
It is estimated that India can meet its own domestic demand and cater to the neighbouring countries demand as well, given the current infrastructure that exists within the country.



Military Aerospace MRO Ecosystem

At present any MRO related work that is carried out for the Armed Forces, or any military MRO is conducted by the Base Repair Depots, and DPSUs. The image below maps the existing facilities that conduct military MRO in the country, along with the type of MRO that is being conducted at each facility.

Figure 2



Source: Indian Air Force Indigenisation Expositions[3] & EY Analysis

3 https://indianairforce.nic.in/content/indigenisation-expositions



Public Sector Presence in Defence MRO

HAL Overhaul Division Bangalore[4]

The Overhaul Division in Bangalore has around 10 hectares of land, which comprise 5 hangars and 16 independent bays exclusively for offering MRO services. MRO services are conducted on the Mirage-2000 and Jaguar fighter aircraft. The Overhaul division also provides component level structural repairs on the following; Tail Plane, Flaps, Under-Carriage Door, Engine Bay Door, Air Intakes, Fin, Rudder, Bird Hit Repairs on Fuselage and Wings, Honeycomb Panel, Integral Fuel Tank Repairs and Replacement of Flexible Fuel Tanks. The division's capabilities include Aircraft Major Structural Inspection/Repair, Defect Investigation/Repair, Non Destructive Testing (NDT) Repairs, Estimation of centre of gravity (CG) on modified aircraft, Paint Removal and Painting of Aircraft, Nose Cone Repairs, Aircraft in Ground (AOG) Repairs etc. The Overhaul Division also provides maintenance support to other military aircraft at various customer bases of the IAF and Navy.

Aircraft Overhaul Division Nasik[5]

The Nasik Division built up area of 1,48,20,000 Sq. meters have state-of-the-art plant /machinery /equipment and infrastructure. The Aircraft Overhaul Division in Nasik is currently involved in the following activities; repair and overhaul of MiG-21 aircraft variants and their aggregates & rotables , Su-30MKI repair and overhaul, and Su-30MKI landing gear repair and overhaul. The facility also conducts export of MiG spares to Vietnam, Malaysia, Peru, Myanmar, and Romania.

Helicopter MRO Division Bangalore[6]

The division provides MRO services for the ALH platform, while also providing repair and overhaul services for the transmission system of the Navy's Sea King helicopters. Currently, the Division has established full facility for undertaking maintenance and servicing of medium light helicopters. With the existing infrastructure the division has been successfully taking up scheduled and unscheduled servicing of ALH MK I, MK II , MK III and MK IV. Division has inbuilt capacity to handle 26 medium lift helicopters per year. The Division is equipped with modern infrastructure and facilities including dedicated transmission lines, LRU Labs, Assembly Hangars and a test centre.

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4 https://www.hal-india.co.in/Overhaul%20Division%20Bangalore/M__97
5 https://www.hal-india.co.in/Aircraft%20Overhaul%20Division%20Nasik/M__137
6 https://www.hal-india.co.in/Helicopter%20MRO%20Division%20Bangalore/M__125



Engine Division Bangalore[7]

This division provides engine repair and overhaul services under license for a range of different engine types, which include the DART533-2, 536-2T (HS-748M), Orpheus 70105 (Kiran Mk.II), Adour MK804E/MK811 (Jaguar), Gnome 1400-IT engines (Sea king helicopter). Other services include repair, overhaul, and rig testing of rotables, defect investigation of engines and rotables, supply of maintenance, spares, tools and test equipment.

Transport Aircraft Division[8]

The HAL Kanpur division provides maintenance, repair, and overhaul services for transport aircraft including the HS-748M, Do-228, and An-32 aircraft. The facility also conducts rotables overhaul and repair, certain rotables include the following:

Mechanical items like propellers, landing gears, actuators, wheel-brake assembly, hydraulics, fuel and de-icing systems and accessories

Instrument items like flight instruments, fuel quantity and fuel flow system, pressurization system instruments, Autopilot and all types of pressure switches and gauges

Electrical items like alternators, invertors, motors, regulators, control and protection units, booster pumps, actuators, fans, batteries and voltage regulators

Avionics items pertaining to communication, navigation, and intercom systems, weather radar and antenna

Engine Division Koraput[9]

This division undertakes overhaul of R25, R29, and RD33 aeroengines, it also conducts overhaul of helicopter engines, while also supplying spares required for first and second-line servicing of engines at IAF bases and BRDs. The Sukhoi Engine Division Koraput undertakes engine overhaul of the AL-31PF engines on the Su-30MKI.

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7 https://hal-india.co.in/Engine%20Division%20Bangalore/M__96
8 https://hal-india.co.in/TAD-Kanpur Division/M__120
9 https://hal-india.co.in/Engine%20Division%20Koraput/M__138

05

Issues plaguing the MRO industry in India and recommendations thereof

While import of aircraft components attract Zero duty currently, importing of component piece parts to repair components in house attract customs duty due to lack of clarification in the customs notification. This lack of clarification will make import of component cheaper than repair of components in country, which is counter intuitive.

Recommendation: Inclusion of terms "aircraft raw material, aircraft standard parts and sub-component piece parts" under Zero customs duty regulations.

With the focus on making India an aircraft decommissioning hub in Asia, there is no GR Waiver exemption for aircraft being decommissioned in India and as such, all components which are to be shipped back to the foreign owners are charged a duty (as the aircraft is not considered under duty exemption). This adds more than 10-15% cumulative cost to the aircraft scrapping process and cost. This is a significant cost for the aircraft owners who pay for aircraft transportation (empty) to the MRO for a foreign country and then have to pay a duty on all the components being shipped back to them. It is prohibitive for any aircraft owner to transport the aircraft and pay duty on its components (stripped components).

Recommendation: GR waiver exemption to be expanded to include "any aircraft brought into India for the purposes of decommissioning and/or scrap page and or recycling by an MRO and or an aircraft disassembling company, wherein components of such aircraft are being sent back to the owner of the aircraft outside India after being stripped from the aircraft."

MRO setup is a significant capex investment that companies have made across the airports in India, MRO's have invested in AAI airports during the times when the traffic was not significant at these airports, however, AAI and some state governments have revised the lease pricing of the land of the MRO's citing the Ready Reckoner Rates for lease of land. This is akin to AAI asking ready reckoner rates from capital intensive airports over and above the royalties being paid by the private airports. Since MRO's require land at the airport in order to provide the services that they are built up for, such MRO's cannot be shifted at special industrial zones identified by state governments, and as such are bearing the brunt of unreasonable lease rates for high capex industry and long lead time industry unlike hospitality industry. It is thus recommended that there should be a minimum 75% discount on Ready Reckoner Rates applicable on land used for MRO Services.

Recommendation: Certain discount on Ready Reckoner Rates (for Lease rentals) on land used for MRO Services.

To achieve scale of economies for the component MRO capability development in India, it is critical that there is in-country aircraft spare parts logistic companies. These companies invest in aircraft spare parts and are in the business of storage and distribution of these spare parts across a region. These companies provide the feed and are a very valuable part of supply chain for a sustainable component MRO capability in country. At present, there is no classification of such companies within the defined terms of regulations and as such they are being grouped under MRO which require approvals and certification to be registered with DGCA. Aircraft spare parts logistic



companies are not necessarily MRO's; in fact some of the largest spare parts logistic companies do not have their own MRO's but support a network of MRO's across Europe.

Recommendation: Inclusion of aircraft spare parts storage, distribution and logistics providers under the overall MRO category, however separated from licensed MRO requirements.

MRO globally is considered a critical infrastructure which requires significant capex investment. This is akin to the investment in airports when handed over for privatization. Keeping this in view, it would be a un-economical or un-feasible for any company to invest in an airport where the term of the lease under the PPP will be short term and will be subject to retendering, however in case of MRO, this conundrum exists, Airports are tendering out hangers which have been built and operated by private players with significant capex investment and are now on the verge of losing their capex investments based on a retender. There are currently no guidelines such as,

1. Maximum escalation allowed for the lease rentals on MRO infrastructure and
2. Right of First Refusal for the incumbent MRO Service provider.

Logistic companies do not have their own MRO's but support a network of MRO's across Europe.

Recommendation: Incorporate 2 key elements as part of MRO Services at Airports, i.e.

1. Cap the escalation on the lease rent on the MRO infrastructure to 3% per annum during any retendering process, and
2. Right of first refusal for the existing MRO service provider

MRO services have significantly varying profitability depending on the type of services, currently in India, the MRO services are the ones where the labor contribution is more than 80% to the total cost of maintenance and such maintenance services deploy higher manpower per dollar of revenue generated and are dependent on the manpower cost advantage to remain competitive. Within Asia Pacific, the labor rate advantage have significantly reduced over the last 5 years due to the impetus and the focus on MRO by Philippines and Vietnam, both of which are attracting the MRO services by very aggressive and smart investment benefit proposals. The diminishing labor rate advantage in India are significantly impacted due to the royalties charges by the Airports and as such are now inching closer to becoming more expensive as compared to Thailand, Philippines and Vietnam. It would be a no brainer that with such competitive rates within a 2 to 3 hour radius of Indian geography coupled with OEM supported MRO's in these regions, it would not be feasible to offer MRO services in India and the industry would resultantly collapse or would be bought over by foreign companies. What is astonishing that across the globe, only India and Nepal charge royalty on MRO Services, while the whole world has acknowledged the dependence of MRO capability in house and charge only lease rentals.

Recommendation: Exemption of royalty charges on MRO services and infrastructure at Airports.



All three, the DGCA, CEMILAC and DGAQA are regulatory authorities that deal with Air Safety and Air Worthiness. In order to achieve convergence of Civil and Military MRO it is important for the three agencies to have the similar standards as is the process followed globally. Currently there are substantial gaps in the methodology of approving and certifying organizations that can perform such tasks. Operating 3 different types of regulatory approaches for the same job is impossible to monitor and will lead to confusion amongst the working technicians.

Recommendation: Harmonization of DGCA with CEMILAC and DGAQA

Since Independence, we have spent tens of thousands of crores of Government money in creation of an infrastructure for manufacturing and support of our Military aviation industry. Given the scale of investments and the facilities built it makes good economic sense to put into practice the PPP model with qualifying industries. This will save time and money with a faster entry into service of the MRO industry to support Indian aviation.

Recommendation: Use of ready built infrastructure by the Indian Government

With an import bill of all aircraft MRO (Civil, General and Military) touching close to $ 5 billion annually, it is recommended that all MRO done locally must be treated tax free for an initial period of at least 10 years. This will encourage domestic investment in development of local capability. Imports of MRO for capabilities available in India can continue to attract import duties and GST.

Recommendation: Incentivize ‘Make in India’ by making MRO performed locally zero rated for all taxes



Other

1. The MRO hubs are recommended to be geography agnostic and independent of Defence Industrial Corridors (DICs).
2. In the first phase, they should be set up at international airports. This is because, in India, we do not have road infrastructure to seamlessly move spares/systems from one place to another. Civil passenger aircraft flying to remote locations for MRO services is a commercial challenge. It may be viable in case of cargo modifications, major modifications. Turnaround time (TAT) is also critical to the MRO industry. Therefore, having the hub at an international airport shall ensure short TAT.
3. Utilize/share existing infrastructure since it expensive to set it up. The already existing infrastructure for example that of HAL and BRDs can be used in a PPP model.
4. Certifications have to be obtained for every MRO facility. Setting up a new hub is expensive and will require new certifications which is also an expensive procedure.
5. It is recommended to issue separate guidelines for MRO services.
6. In defence contracts, offsets are left as a monetary issue. We must consider in what form is it coming to India? Are we getting any technology? For example, it is not commercially viable to set up an MRO facility for the Indian C-130 fleet. However, if there is ToT then India can carry out MRO for the entire world's C-130 fleet providing a starategic advantage to the nation.
7. Every aircraft manufacturer issues a Special Repair Manual (SRM), Component Maintenance Manual (CMM), Aircraft Maintenance Manual (AMM), Illustrated Parts List/ Illustrated Parts Catalogue (IPL/IPC). FOEMs are not willing to share these manuals with Indian entities. This issue needs to be addressed.
8. It is recommended to harmonize the qualification standards. The need for the same is emphasised by the differences in staff qualification requirements by EASA in comparison to DGCA.

06 Conclusion

It is anticipated that convergence between defence and civil MRO shall prove advantageous to the aviation industry in India since it will create economies of scale and generate huge employment. It has been noted by certain industry members that converging of the two spheres shall require clarifications or guidelines because of the difference in the set of certification requirements.

Since the use of UAVs continue to increase for both civil and military applications, it will be cost effective to have mutual set ups for MRO.

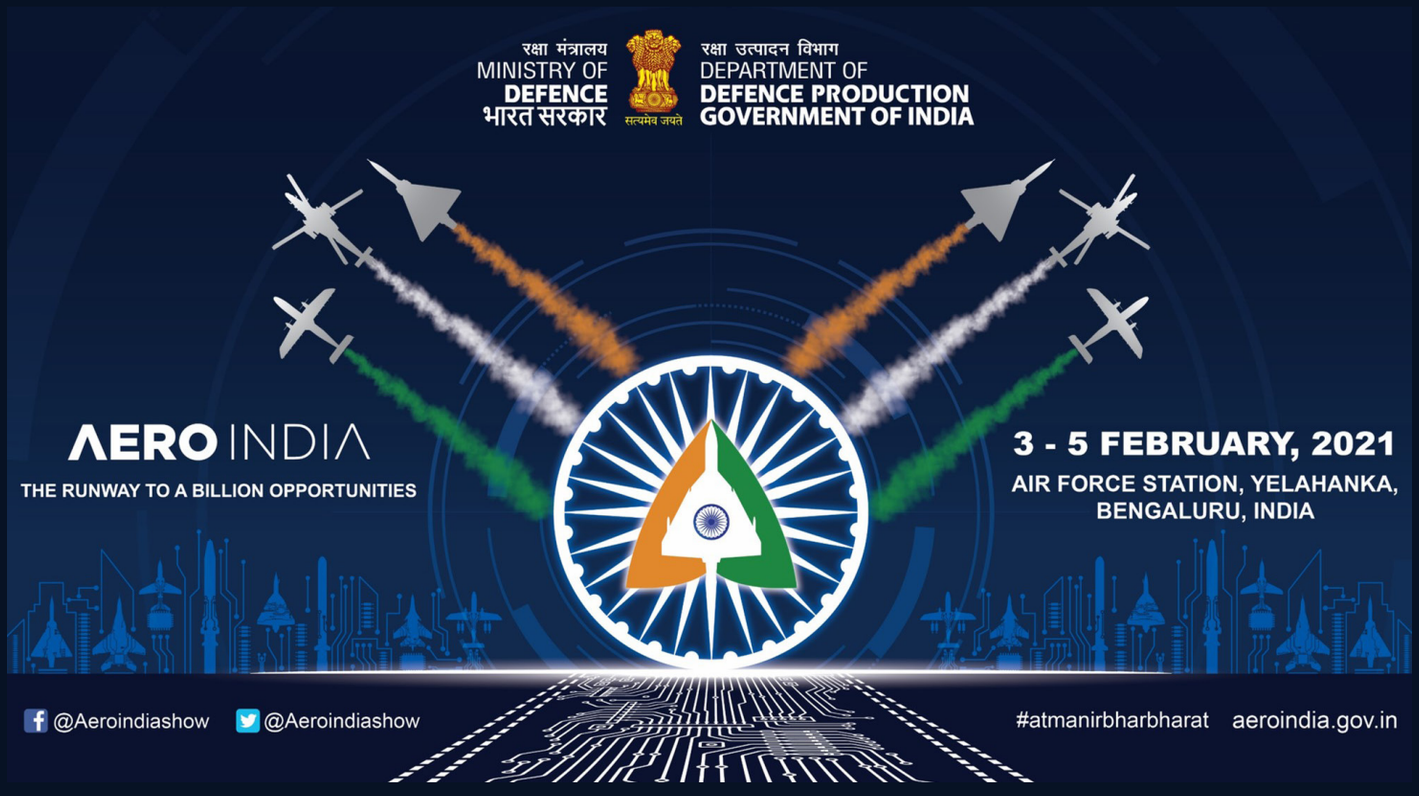
Under the aegis of Make in India, India is open to partnering with the manufacturers of the world. The DPIIT has also been working on creating a national single window system which is projected to be launched by mid-April 2021, which will be a convergence point for clearances for investors. DPIIT has put together and launched a GIS enabled land bank which is in public domain now.

In August 2020, Ministry of Civil Aviation (MoCA)[10] notified that convergence between Defence MRO and Civil Sector MRO is being done for economies of scale. In this regard, a Joint MoCA-DPP Working Group has been formed to undertake facility mapping and draw up areas and resources that can be shared for achieving convergence. The group held meetings on 10 and 13 July 2020 with participation of defence and civil industry stakeholders. MoCA also listed the civil MRO activities in July 2020 including IAF's commitment of sending 10 MI-17 helicopters to Pawan Hans Ltd's MRO facility, MI-17 weapons modification and interior refurbishment/ upgrade (19 nos. has been bid for), fuel tank-related MRO of 20 Avro aircraft and 145 Dornier aircraft structural refurbishment.

In view of the above and the recommendations provided in the previous section, as we move forward, partnering of civil and defence entities shall be vital to achieve the goal of convergence and develop India as a holistic MRO hub.

10 https://www.civilaviation.gov.in/sites/default/files/Monthly_Summary_july_2020.pdf




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