

**REPORT
OF
WORKING GROUP
ON
AEROSPACE
SECTOR**

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AVIATION INDUSTRY

1. OVERVIEW

Aerospace manufacturing is a high technology industry that produces "aircraft, space vehicles, aircraft engines, propulsion units, and related parts". Its value chain is characterized by a long project life cycle spanning R&D, engineering design, manufacturing, assembly, maintenance, repair and overhaul. Intensive technology and safety requirements mandate significant investments in R&D and quality control. India is one of the fastest-growing aerospace markets. Bangalore is a major centre of the aerospace industry with Hindustan Aeronautics Limited, the National Aerospace Laboratories and the Indian Space Research Organization. The three segments of the Industry are: Defence, Civil and Space.

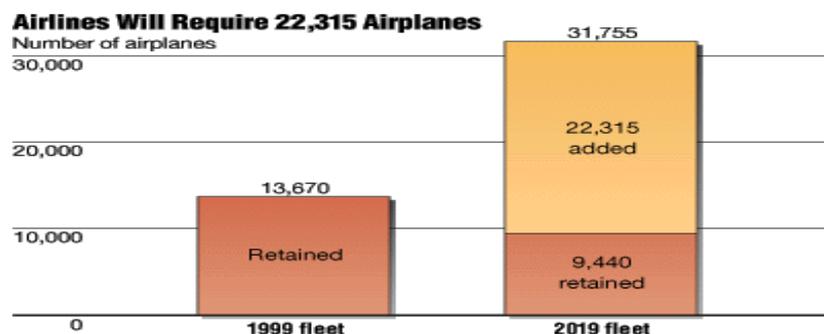
1.1 Defence:

India has embarked on major defence acquisition and development programmes comprising Medium Multi Role Combat Aircraft (MMRCA), Fifth Generation Fighter Aircraft (FGFA), Multirole Transport Aircraft (MTA), Medium Lift Helicopters (MLH) and Light Utility Helicopters (LUH). The industry will witness more than double the number of aircraft and helicopters to be produced during the next decade.

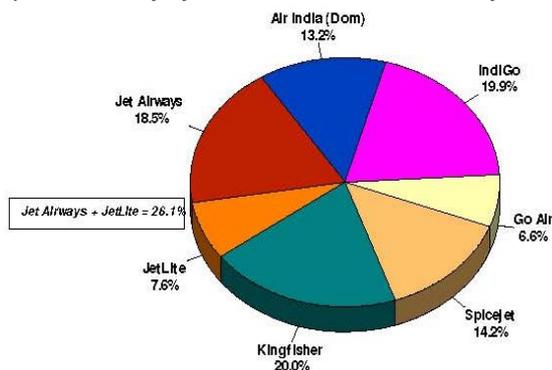
1.2 Civil Aviation:

Globally, the aviation industry has till recently been driven by technology developed for military purposes. But of late, civil aviation requirements are driving dedicated technology development. Indian civil aviation industry's rapid growth is driving modernization of airports, communications, radars and facilities for Maintenance Repair and Overhaul (MRO) of aircraft and sub systems. The air traffic in terms of passenger and cargo movement has increased by a CAGR of 19.14% and 9.91% during the period from 2003-04 to 2007-08. The fleet size has grown by 23.77%. The civil aviation market is expected to register more than 16 per cent CAGR during 2010-2013. The Indian commercial aerospace market is estimated to absorb about 1,100 commercial jets worth Rs.585,000 crore over the next 20 years.

The World Fleet is expected to double by 2019



(Source: Study by Dr. David Pitchard, University of Buffalo during aviation week Toulouse symposium)



Civil Aircraft Operators in India

(Source: Centre for Asia Pacific Aviation and Indian Ministry of Civil aviation published in Feb 2011)

1.3 Space:

India is ranked sixth globally, in terms of space budget and technological capabilities. India's space industry is different from its defence industry, wherein indigenous suppliers provide an estimated 70 per cent of the technology content. The current major space programmes are PSLV, GSLV, INSAT and IRS.

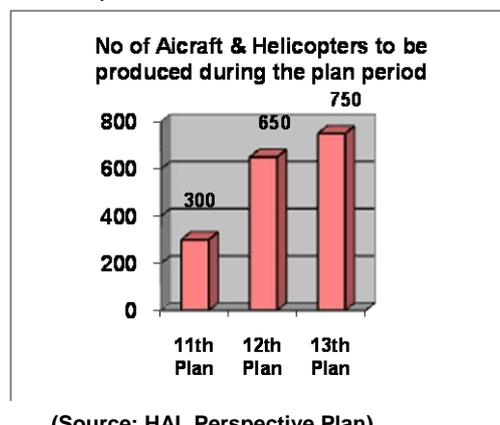
2. Opportunities

2.1 Growing internal demand in civil and defence aerospace sector

2.1.1 Defence:

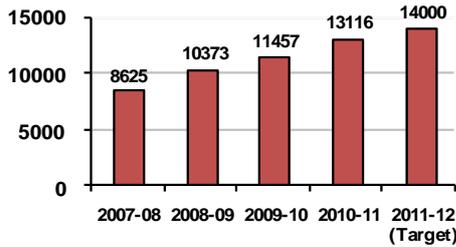
New acquisitions during the 12th and 13th plan period will almost double the military aircraft and helicopters produced in the next 5 years. Around 650 aircraft are estimated during the 12th Plan period compared to around 300 during the last 5 years. (source: HAL Perspective Plan).

HAL has been the major producer for the Indian armed forces. The turnover of HAL at the end of the 11th five year plan will be Rs. 14,000 crore with an annual growth rate of more than 10%. The growth pattern is expected to continue in the 12th Plan also. The turnover of HAL at the end of 12th five year plan is estimated at Rs. 23,500 Crore. The new programmes will create employment opportunities in HAL. Its manpower requirement at the end of 12th five year plan is estimated at 42500 from the present level of 34000.

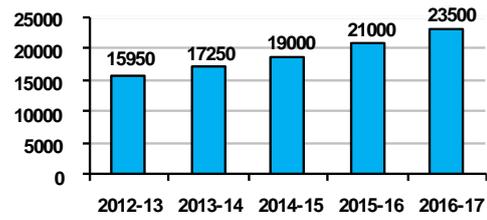


(Source: HAL Perspective Plan)

Turnover during 11th Plan
(Rs. Cr)

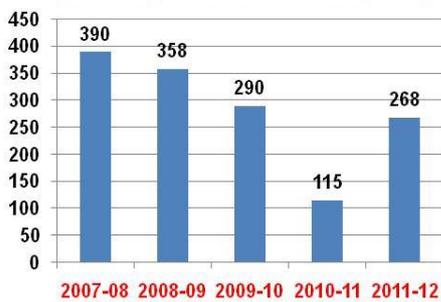


Turnover planned during 12th Plan
(Rs. Cr)

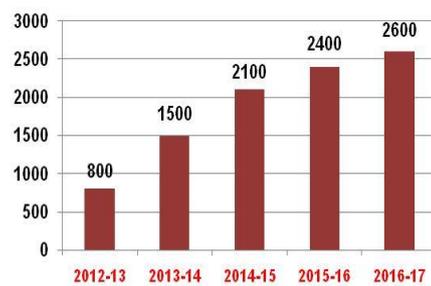


Capital investment of Rs. 9400 crore is estimated for implementation of new projects during the 12th plan and beyond. The capital investments during 11th five year plan were around Rs. 1400 Crore.

Capital Facility sanctions - 11th Plan (Rs Crs)



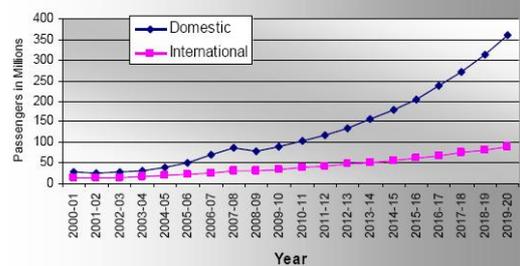
Capital facility projections for 12th Plan (Rs Crs)



2.1.2 Civil Aviation Sector:

Indian civil aviation sector could witness a growth up to 20% in the domestic passenger traffic. India's air passenger travel has been growing at almost 25% a year and it will outpace the global average by 2025.

Growth in Passenger Traffic - All Airports



(Source: Air traffic review by AAI 2008-09 with 2006-07 as base)

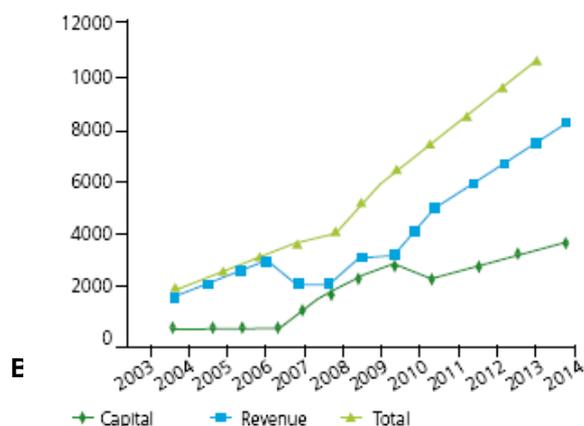
Aircraft Seating Capacity	1995	2006	2015 Forecast
300 and more	11	18	36
200 to 300	30	50	120
100 to 200	60	186	350
50 to 100 seater	20	58	200
Total	121	312	700*

A projection of number of aircraft required by India in the next 3-4 years is depicted in the table. DGCA estimates a requirement of 700 aircraft by 2015.

(source: DGCA)

2.1.3 Space

The investment in Space industry is expected to increase by an average of 14.8% annually and is estimated to reach Rs. 10,000 crore by 2014. India is well positioned to become a global player in supplying advanced technology at a fair price in the global space market.



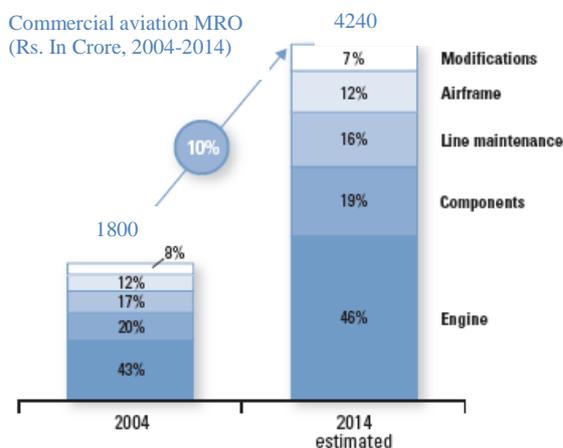
(Source: Report from Deloitte, Overview of Indian space sector Aug 2010)

2.2 Offsets

The Government in its defence offset policy requires a minimum 30% plough back of forex outflows from defence procurement into the Indian industry. The offsets are going to offer a tremendous business opportunity to the Indian industry. Since the introduction of offsets, contracts worth Rs.14146.22 crores have been concluded so far. The procurement of 126 medium multi-role combat aircraft by the Indian Air Force is expected to bring in potential offset opportunity of over Rs 20,000 crore.

2.3 MRO(Maintenance, Repair & Overhaul) Requirements:

The Indian MRO sector has the ability to absorb technology transfer at depot level for aircraft as well as components, and has the potential of becoming the international hub for MRO needs. India's MRO segment will grow at 13% annually.



(Source: India Aerospace: poised for takeoff report by AT Kearney-2009)

New partnerships in MRO sector		
Foreign company	Indian company	Location
Boeing	Air India	Nagpur
Malaysia	GMR	Hyderabad
Lufthansa Technik	GMR	Hyderabad
EADS	Air India	Delhi
Sabena	Taneja Aerospace	Bangalore
Pratt & Whitney	HAL	Bangalore

Source: A.T. Kearney analysis

3. CONSTRAINTS

3.1 SME participation:

The liberalisation of the Aerospace sector in the mid-nineties has resulted in a remarkable growth of this sector, as a large number of private players have entered the sector. However, the SMEs face hurdles due to the high capital cost, low volumes and long gestation period of projects.

3.2 International certification:

Getting certifications for processes and parts is a challenge for India-based suppliers. It is also a deterrent for OEMs to outsource some of their components to India, since approvals for parts/components made in India can sometimes take too long and as a result becomes cost inefficient.

3.3 Quality issues: The aerospace industry has to work on a zero defect target. While quality control in Indian manufacturing has improved significantly, a mature supplier base is still being developed in the country.

3.4 Fragmentation of the sector:

The aerospace sector has multiplicity of organisations which can lend greater synergy to the sector if they all knew as to "Who has got what". Firstly there is information gap between the defence and non defence sectors. DRDO and HAL are confined to the defence sector while NAL and other civilian aerospace companies remain insulated from the developments in the defence sector. Greater interaction among the two sectors will yield a higher national dividend.

4. STRENGTHS

4.1 Manufacturing Base:

India offers cost advantages and the cost savings could range between 15 to 25 percent in manufacturing, depending on the type of component. Indian industry today has the technological capabilities to undertake complex manufacturing required for the sector.

(Source: Report by Pricewater House Coopers on changing dynamics Indian Aerospace industry)

4.2 Trained Manpower:

With over 380 universities, 11,200 colleges and 1,500 research institutions, India has the second largest pool of scientists and engineers in the world. Every year, over 2.5 million graduates are added to the workforce, including 300,000 engineers and 150,000 IT professionals. This human resource pool can give an advantage in this sector.

(Source: Report by CII & KPMG on unlocking the potential for Indian Aerospace & Defence Sector)

5 RECOMMENDATIONS:

i) National Aeronautics Commission - There are a number of aeronautics organisations like HAL, NAL, DRDO laboratories, ADA, ADE, GTRE, IISc, IITs etc. in the country. Moreover, the sector is divided into defence and non defence segments. Now private companies are also entering. All the knowledge residing in these entities can be synergistically harnessed if a National Aeronautics Commission is created. The commission should map indigenous capabilities, identify knowledge gaps, direct resources efficiently to address critical technology gaps. The commission through active engagement of stakeholders should formulate a national aeronautics policy to strengthen the aerospace industry.

ii) Strengthening of certification organisations: The health of the industry has a direct co-relation to the quality and robustness of the certification organisations. CEMILAC is the agency for defence aircraft and DGCA for the civilian aircraft. Given the expected increase in the work in the sector, both organisations should be strengthened. The government should facilitate certification of SMEs. The process is both complex and expensive. Schemes to create awareness among SMEs and also part finance the process should be started.

iii) Strengthening of Quality Assurance Organisations: Constant and stringent quality assurance is another critical requirement of the industry. Directorate General of Aeronautical Quality Assurance (DGAQA) performs this function for the defence sector; DGCA is responsible for the non-defence sector. Both organisations need to be strengthened and scaled up. Government should launch schemes to create awareness amongst SMEs.

(iv) **PPP model:** As most of the work in this sector has been done by Government organisations, the PPP model by forming JVs should be encouraged in order to fully exploit their knowledge base coupled with entrepreneurship of the private sector. This will result in expansion of aeronautical industrial base in the country and help make the Indian aviation sector highly competitive and efficient.

(v) **Special aerospace economic zones:** As every component of an aircraft/system needs to be certified and subjected to a rigorous quality assurance regime, creating clusters makes greater economic sense in this industry. Such enclaves should be set up with the requisite infrastructure like air fields and traffic free air space. The growth in offsets could be efficiently utilised in such SEZs.

(vi) **Synergy between offsets:** A mechanism needs to be put in place for facilitating synergy between offsets in the defence and civil aviation sectors to achieve the desired results.
