aviotech

Indian Chamber of Commerce

Aerospace and Defense Manufacturing in India

Commencement of growth phase

aviotech

Indian Chamber of Commerce

2nd National Manufacturing And Innovation Summit

20th April, 2011 New Delhi

Foreword

India began opening up its defense industry in 2001 when the government first allowed private sector participation and some foreign investment. Private participation however, was limited to a few large industrial groups and a large diversified industrial base to support a domestic industry capable of meeting the needs of Indian Defense forces locally could only evolve in a limited manner.

2006 saw the introduction of the Defense Offsets as a tool to leverage India's purchasing power with a view to creating demand for Indian aerospace and defense manufacturing and service delivery as well as generate foreign investments in the sector – both in manufacturing as well as in research and development.

The expansion to the offset policy as effected through progressive expansion of the scope in 2008 and subsequently in 2011 has tried to make it inclusive in nature by trying to incorporate elements from the civil aviation and homeland security sectors. These are adjacent markets to the defense sector with similar products where growth of one has the ability to affect the other. A number of SMEs which are in the field of homeland security are bound to gain from the new offset policy.

2011 has seen the announcement of Defense Production Policy which has given the requisite focus and preference to indigenous design, development and manufacture of defense equipment as the key driver for the growth and modernisation of the defense industrial base in India. The policy also aims at creating conditions conducive for the private industries to play an active role to achieve the objective as well as to leverage the potential of Small and Medium Enterprises (SMEs) which are expected to form the bulwark of Indian defense manufacturing ecosystem.

The Government has also over the past few years introduced a number of measures to make the acquisition process industry friendly and to increase transparency.

Additionally, The Government is working towards creating a level the playing field for Indian industry when it competes with foreign OEMs as well as when it competes with the Defense Public Sector Undertakings (DPSUs).

The success of these initiatives will only be known over the medium to long term. While the intent and the initiative has always been positive, the implementation has sometimes not been as smooth as both the government and the Industry desire. Key challenges remain in this segment and the environment today affords the best opportunity to address these long pending issues and carry forward the task that was undertaken a decade back.

Keeping this in view, the Indian Chamber of Commerce is organizing the 2nd National Manufacturing & Innovation Summit 2011 to address issues that impact manufacturing innovation and competitiveness in Defense, Aerospace and Homeland security markets. India needs to achieve self-reliance through greater inclusion and development of the small and medium (SME) manufacturing environment in consonance with the growth led by DPSU's and large key private sector organizations.

The theme of Indian Chamber of Commerce for the current year is inclusion, empowerment and development which are complementary to the policies of Ministry of Defense. It is with this objective that ICC in partnership with Aviotech is publishing this report to highlight the issues relevant to the aerospace and defense sector and the key actions that are needed to facilitate an enhanced role for them. I hope this report will encourage the government and industry to proactively address issues and contribute in formulating a strategy for the planned growth of this sector in India.

Jayanta Roy

President
Indian Chamber of Commerce

Preface

Indian economy continues to outperform the global economy. It continues to show a strong uptick in overall growth driven by the services and manufacturing sector.

In the present times when the world economy is still not out of the woods, India's $1.3 trillion economy grew by 8.9 per cent through the first six months of fiscal 2011. This is not a new trend as has been shown by the sustained period of high single digit growth witnessed in the mid to latter part of the earlier decade.

India has been a key destination for global defense contractors as a defense market. It is one of the top defense spenders in the world. India has the tenth largest defense spend in the world. In 2011, India's expanded its defense budget by 3.98 per cent to Rs. 1,47,377 Crore (1 Crore = INR 10 Million) representing 2.12 per cent of gross domestic product (GDP). Of this, approximately 40 percent finds allocation under capital expenditure and equipment modernisation programmes. Since the current levels of indenisation are anticipated to be around 40%, a significant outlay is towards global procurement.

More significantly, India's defense spend has been expanding over time and continues to do so in face of a volatile neighbourhood and internal security challenges.

It is anticipated that for the period 2011-2015, Indian military is expected to spend more than $80 billion on acquisitions with the Indian army having a largest contribution >50% followed by the Indian Airforce and the Indian Navy. Capital expenditure is expected to grow at 10% per annum for the period which is significantly positive as compared to other global economies.

With a growing civil aviation market, Indian companies have been at the forefront of demand generation for aircraft manufacturers. An example is found in the single largest order for Airbus in early 2011 which came from an Indian airline operator.

The Civil Aviation market in India is growing at a compound annual growth rate (CAGR) of 18% and it is anticipated that the Indian aviation sector will become one of the top five civil aviation markets in the world over the next five years.

India continues to enjoy the benefits of a growing economy, large domestic demand, young population and stable government policies coupled with a maturing investment structure and a strong legal system.

India's Defense and Aerospace manufacturing opportunity is dependant upon its ability to emerge as a cost-efficient manufacturing and service destination in this segment.

While the journey towards India emerging as a global Defense and Aerospace manufacturing base has already commenced in the right earnest, it will have to be supported in equal measure by the translation of the requirements of the OEMs by domestic industry as well as by a supportive government policy. Policy impetus in the form of Offsets and the new Defense Production Policy will support the focus on inherent cost and quality parameters that Indian manufacturing has displayed in other industrial sectors.

All of the above makes India a destination of choice for global defense and aerospace contractors to have a manufacturing and delivery presence in.

Rahul Gangal

Director – Defense Advisory and Investments
Aviotech

Evolution of the Defense and Aerospace manufacturing industry in India

Indian aerospace and defense manufacturing has historically been dominated by the government owned and managed Defense Public Sector Undertakings (DPSUs), Public Sector Undertakings (PSUs) and the Ordnance Factory Board.

Even today, the bulk of the Aerospace and Defense system level production is concentrated with the DPSUs and PSUs. This is not very un-natural because of the centrally planned economy structure of India for a large part of its independent history.

Globally, Defense and Aerospace manufacturing has grown in a tiered structure with the OEM at the top of the pyramid, followed by the tier-1 suppliers who do large portions of a programme, who in-turn are supported for smaller portions of their contribution to the programme by Tier-2 and Tier-3 manufacturers and finally the component manufacturers at the bottom of the pyramid. Such a structure allows for clear flows of work-share liability downwards while allowing for contribution to flow upwards.

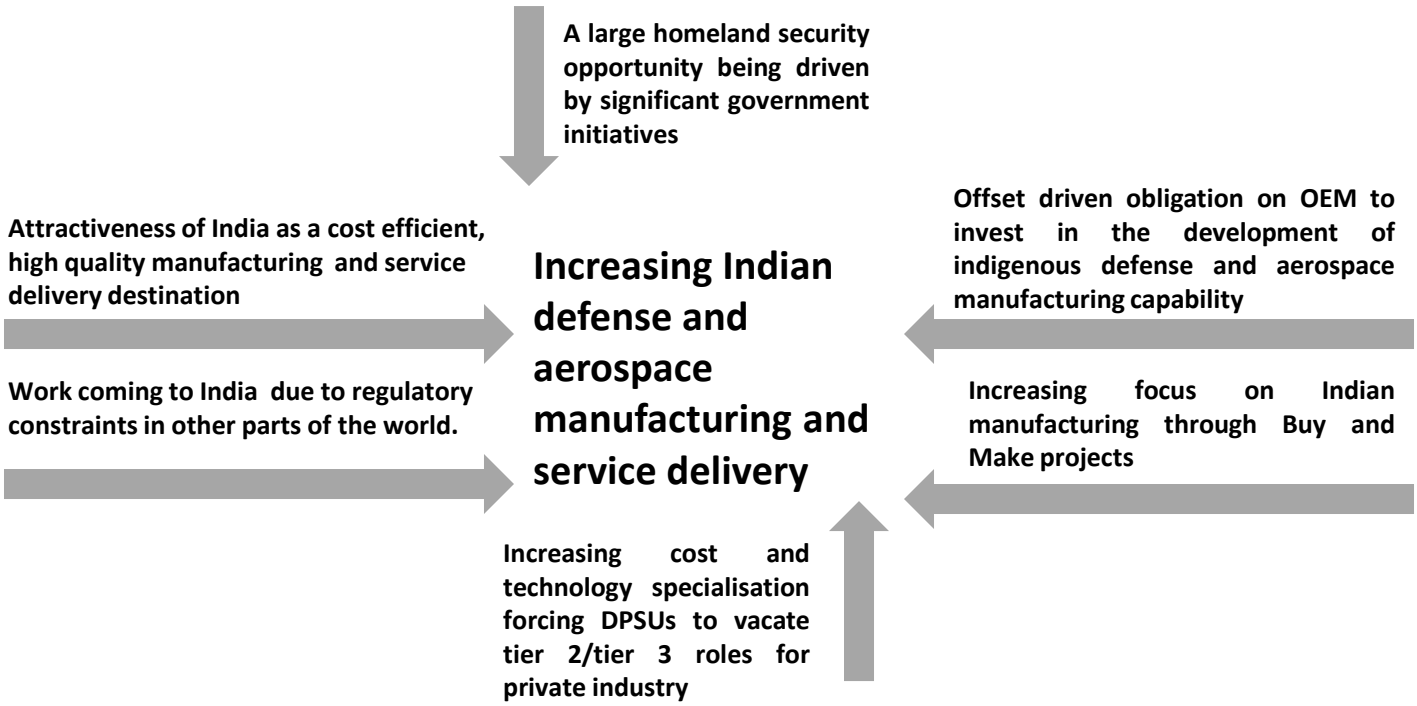
The manufacturing segment in India has followed a slightly different path of evolution and market structure from elsewhere in the world. The Indian experience on this particular aspect is slightly different with historically the DPSUs / PSUs and OFB participating in the entire value chain – commencing from an integrator level right down to the Tier-3 suppliers / component manufacturer level thereby leaving little room for private sector capabilities to develop.

This has also resulted in a very dispersed presence of DPSUs across the value chain which has been a factor for their not being in a position to address all the parts of the value chain in terms of research and technological edge.

Rising costs in being across the value chain for DPSUS and increasing costs in technology specialisation related product development pressures for each part of the value chain presence are putting pressure on DPSUs to restrict their role to that of an integrator thereby allowing for larger work-share to private sector, the tier-1 and tier 2 space has emerged as a vacant space that private industry is trying to fulfill.

This entire process is also supported by the creation of offset driven demand for the products which will be produced by private sector Tier-1 and Tier-2 manufacturers.

The sudden interest in the growth and development of Indian defense and aerospace manufacturing capability stems from both policy driven opportunity as provided by Offsets as well as the Make policy and now the Defense Production Policy on one hand as well as the emergence of India as a manufacturing destination of notes.



These factors are a combination of attractiveness of India as a cost-efficient + high-quality manufacturing and service delivery destination, a strong policy push through the introduction of offsets as well as an expressed business opportunity provided by both homeland security projects and large opportunities under the 'Make' and 'Buy and Make – Indian' category.

All of this presents a significant opportunity for Indian manufacturing capability to emerge in this sector however it has also resulted in constricted existing capability of the industry to absorb demand being created by Offsets and the government impetus on 'Buy and Make-Indian' and 'Make' projects.

Aerospace and Defense manufacturing and service delivery capabilities in India : Key notes

- **Large industrial base with a predominance of SMEs**
  The existing supply chains of DPSUs and Ordnance factories comprises thousands of suppliers, most of whom are component level suppliers. A disproportionately large number of these suppliers are small enterprises – thereby with limited capacities. Most of these SMEs are suppliers who operate niche technologies and processes, thereby making them valuable.

- **Ability of the Indian industry to absorb large volume of work**
  While at a capability level the existing capacities and few suppliers for each specific product/component result in an Industrial base that may appear to be rather limited in depth, hence creating issues vis-à-vis the ability to absorb relevant work-share either from the Offsets or from large indigenous projects, the fact is that this assessment varies from segment to segment. It also varies from service to service wherein for example the Indian Navy has achieved a significant level of indigenization while the same cannot be said about the Air-force and the Army. It is also seen that over the past year or so, the order book addressed by the private Indian industry from the DPSUs as well as from offset arrangements signed with OEMs shows a fairly large volume commitment exceeding USD 10 Bn.

- **Limited capability at basic sciences level**
  Indian aerospace and defense industry is exposed to some risk from its limited expertise on material sciences. This is seen across speciality metals and alloys, composites and man-made fibres as well as specific reagents for treatment. A case in point is elaborated on the composites business where Indian capability in the private sector has still not evolved in the precursor and fibre segment. Some of this limitation also has its historical genesis in non-transfer of material technology to Indian companies.

- **Industrial capability graduating from a build-to-print to a build-to-spec level**

  India has always continued to enjoy sustained and significant business interest and work-order translation in Engineering design – a segment where India is recognized as a global player. However what is becoming clear now is that even for the other segments of the manufacturing value chain, Indian companies are no longer limited to lower margin translation of design into manufacture at a build-to-print level. There is an increasing push from the Indian Aerospace and Defense industry to move up the value chain and participate at the level of translation of the specifications into design and thereby be in a position to contribute in a larger and richer manner possible.

- **Infrastructural requirements : Dedicated SEZs for Aerospace and Defense**

  Special Economic Zones dedicated to Defense and Aerospace. Will enable export oriented businesses (especially Offets since it is largely export oriented) to leverage significant policy, economic, structural and procedural benefits – all of which enable a more cost effective product / service delivery. The integration of the Special Economic Zones (SEZs) with the relevant Ministry of Defense's policies and procedures has still not been completed. This if completed, can bring significant advantage of Indian aerospace and defense manufacturers vis-à-vis global competition.

- **Defense company financing : Need for a technology fund as well as Private Equity participation in the sector**

  There is a lack of financing options for the MSME segment of the Industry. Cyclic nature of industry, long gestation periods until product stabilization and acceptance and limited seed capital with entrepreneurs puts significant financial pressures upon businesses in this segment. Subsequently raising capital from conventional sources can be extremely difficult even for large

companies. The new Defense Production Policy announced in 2011 does take its first steps in this direction by explicitly referring to the setting up of a fund to support initiatives, however it may not be enough.

The industry has also started seeing its first wave of consolidation with larger groups paying a premium for specific niche capabilities in the MSME sector. It is anticipated that this wave of consolidation will strengthen over the near term because of the need of large players to quickly deploy specific capability in segments where large project opportunities are available.

- **Availability of skilled manpower**

  A quantum jump in availability and quality of skilled manpower is required for this industrial segment to expand in the proportion desired and anticipated. The traditional sources of engineering talent like the DPSUs and the services are proving inadequate for meeting the challenge. Whilst there has been an increase in the number of institutions offering specialised engineering degree programmes in this segment however the demand continues to far outstrip the supply.

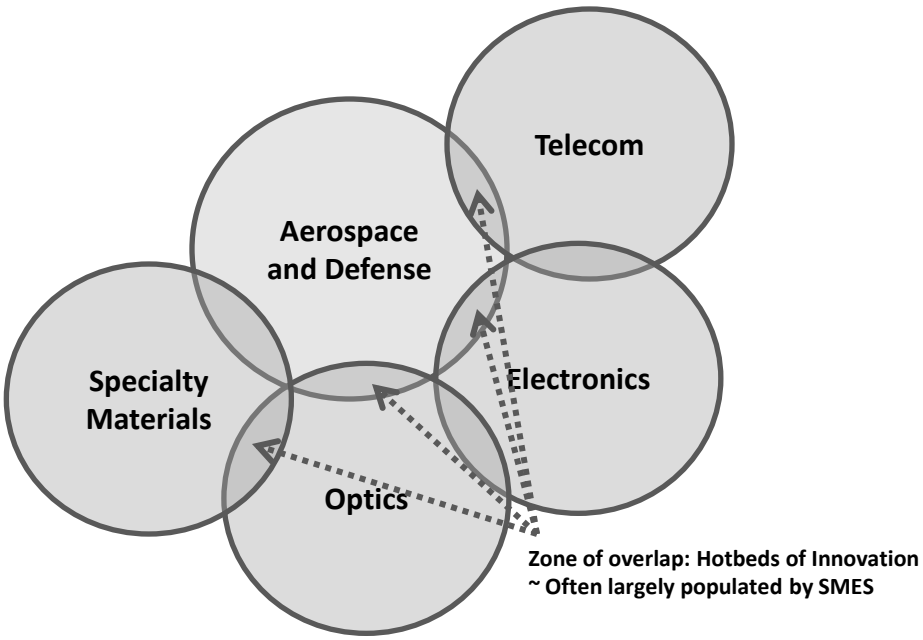
  Quality of talent is also a linked but critical issue. A sustained shortfall in quality entry-level engineering can stall the growth of this segment.

  Some OEMs have established linkages with Institutions and are actively contributing in making their curriculum relevant as also assuring themselves of a steady supply of human capital.

Aerospace and Defense Manufacturing and linkages to Innovation trends

The Indian experience in Aerospace and Defense manufacturing with regards to its linkages to innovation is not very different from other parts of the world.

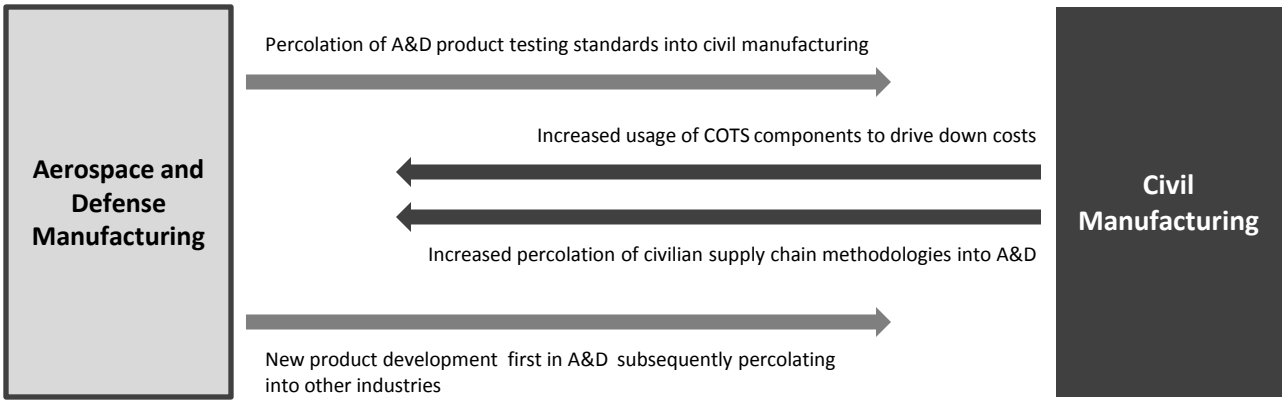
Aerospace and Defense manufacturing increasingly has very strong overlaps with other strategic and large industries like telecommunications, electronics, optics and specialty materials. The zones of overlap are the hotbeds of innovation. It is also true that these zones of hotbeds are largely populated by Small and medium enterprises (SMEs).



Another factor that is increasingly visible is the impact civil industries are having on Aerospace and Defense manufacturing. Key among these trends is the increasing usage of Commercially-off-the-shelf (COTS) based civil manufacturing components in systems made for use in A&D segment. This has been made possible because of reciprocal trend of mil grade testing percolating in the civil component manufacturing. The result is that while the A&D industry is leveraging the cost competitiveness that is provided by

basing an industry on commercially available and significantly lower priced components, the difference in the quality of such components between what was even 10 years back Mil grade and civil components has increasingly gone down due to adoption of mil grade testing in civil industry.

These hotbeds of innovation are also largely build around commercial technologies since it is extremely difficult for any industry today to fund the innovation purely for Aerospace and defense needs.



India's experience is not very different and a significant part of new product development /indigenization is being built around lower priced, more widely available and serviceable COTS based systems.

This augurs well for the industry which is also seeing pressures from private industry as for the first time, private Indian industry is investing sizeable monies in Research and Development. Consequently, there is an expectation for comparable to civil returns on innovation and R&D.

All of the above is also resulting in standardisation of supply chain procedures in favour of long term supply partners and risk sharing partners.

Some key issues before the Indian A&D industry

- **Definition of what constitutes a defense product**

  A key issue with the current environment for Defense and Aerospace manufacturing concerns the definition of Defense Product. There are currently three sets of definitions of a defense product and these are yet to be harmonised.

  These include the definition of defense products as per ITC-HS (Indian Trade Classification – Harmonised System), the list of what constitutes valid offset as per the Defense Procurement Procedures and the list of items that are referred to for control of trade under the SCOMET list.

  It is important to have a standard understanding of what constitutes a Defense Product (especially when dealing with dual-use items) from the DIPP perspective as well. It is imperative at this juncture to look at some western countries like the US which have harmonised their systems and work on a standardised Munitions List.

  The issue is further complicated by lack of a clear definition of Defense and Aerospace products in the Indian Trade Classification- Harmonised System (ITS-HS). This issue assumes criticality as only after that the current export procedure for Defense Products (a significant part of which are governed by SCOMET guidelines) has been rationalised with the population of category 6 of the SCOMET list and the ITC-HS, can a true assessment of Industry be made and transparency in policies ensured.

- **Licensing, Manufacture and Export of Defense products.**

  Whilst the government has come up with a simple model which provides for the requirement of an Industrial licence only to those Indian manufacturers which are making complete systems, the OEMs in their endeavour of not being short of meeting the

rules and regulations at any level generally insist on the Indian offset partners in securing a licence. This problem also manifests itself with the requirement of an Industrial Licence for defense products when the latter itself is not clearly specified as may be the case for example with C4I systems. Greater clarity on the applicability of IL for Indian manufacturer and widespread acceptance of this will be the only way forward on this.

- **FDI**
  Manufacturing of defense equipment in India is subject to a 26% cap on FDI. A 26% cap on FDI discourages original equipment manufacturers (OEMs) from bringing in proprietary technology. Another fallout of the low FDI cap is that this could possibly result in limiting the foreign capital inflows into the sector and thereby increases the corresponding fund requirements of the Indian partners. The argument against raising the FDI cap to more than 26% stems from the fear of Indian companies ceding control and thereby resulting in units that can be closed in situations of operational need of the armed forces rendering a disruption in the supply chain. The FDI issue is a key determinant to the interest of Foreign OEMs in developing India as a manufacturing base.

- **Transfer of Technology & associated issue of Multipliers**
  It is reasonably understood that the next evolution of the Offset policy would involve bringing-in mechanisms that provide for valuation of the technology that an OEM is bringing to the Indian Offset Partner and then providing credits for it. Such a model will necessarily involve introduction of multipliers and at this stage it would possibly bring great value if the government may consider introduction of Multipliers for the offset projects resulting in Offset projects generating first time exports, Offset projects undertaken with the MSME segment and Offset projects under sub-heading :"Investment in R&D". An argument against this is that technology transfer should not be considered to meet offset obligations, since transfer pricing mechanisms are used by foreign companies to gain an advantage, however it is clear that for Indian industry to develop a widespread base relevant in the global arena, it will need to integrate into the global TOT regime.

Outlook

The various issues do create a complex situation to assess Indian Defense and Aerospace manufacturing and service delivery capability.

The response of the industry segment to all the industry forces and policy initiatives is and will be best reflected in tangible performance demonstrated.

Indian industry over the past few years has shown the ability to respond effectively to the market opportunity, especially in the global market. There can be no better indicator of this than an assessment of Aerospace exports as a testimony to this fact.

Indian Aerospace Exports over the last ten years can be very neatly summarised into two phases– A first phase until 2006-07 and a second phase of the subsequent period.

The first phase of 2001 until 2006 which saw stagnant, lacklustre performance with exports virtually stagnant and ranging between USD 49.76 Mn in FY2004-05 and USD 85.29 Mn in FY2001- 02.

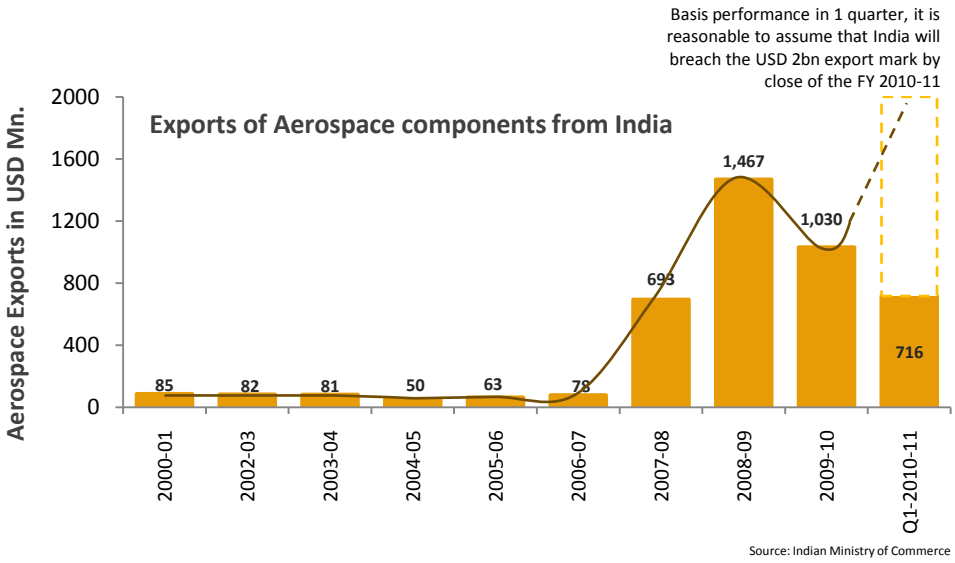
The Aerospace Exports were also not displaying any significant growth indicating a less than healthy state of the industry. The export performance witnessed in this period was largely driven by export actions of DPSUs namely Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL)

The period from 2007 onwards sees a rapid expansion in this activity indicating a strong focused industrial expansion of the sector. The levels of exports rose significantly from USD 77.54 Mn in FY 2006-07 to USD 693.28 Mn in FY2007-08 indicating a jump of 692% on a YoY basis further to USD 1467.02 Mn in FY2008-09 indicating a jump of 141% on a YoY basis.

The Aerospace exports out of India saw a mild contraction over the year2009-10withthe total exports levelling-off to USD 1030.34 Mn. This can be attributed to the global slowdown impacting off-take from India.

Of the total Aerospace exports (platforms, parts and components), Parts & components have historically contributed to over 90% of the total exports. This trend sustains even until 2011.

In just the first quarter of 2010-11, exports of this category have crossed the USD 700 Mn mark.



Based on this trend, an end-of-the-year export volume of USD 2 bn may be estimated

The total number of export destinations in 2009-10 was 68. A bulk of these exports were concentrated with the top 10 destinations. These were USA, Germany, France, Singapore, UK, Russia, New Zealand, Netherland, Israel and Malaysia, contributing to approximately 90% of total exports.

Exports figured recorded are a combination of civil and military aerospace exports.

Military exports (historically driven by defense PSUs) have only started to register meaningful participation from private Indian companies like Tata Group, Mahindra & Mahindra, Bharat Forge, Ashok Leyland and others on account of increasing translation of OEM offset obligations into work-orders on Indian companies.

A further factor for enhanced private sector participation is the increasing number of global OEMs establishing dedicated centres for manufacture and supply in India. Examples include Goodrich for landing gear & Thales and Rolls Royce for engine components

The aforementioned example only proves that India has the potential to emerge as a preferred Defense and Aerospace Manufacturing and service delivery destination.

For the Indian industry, its journey towards being an integral part of the global supply chain has only commenced. The path ahead is tough, however the intent appears well-set.

Glossary of terms

DPP	Defense Procurement Procedures
DIPP	Department of Industrial Policy and Promotion
DOFA	Department for Offset Facilitation
DPSUs	Defense Public Sector Undertaking
FDI	Foreign Direct Investment
FERV	Foreign Exchange Rate Variation
FMS	Foreign Military Sale
GDP	Gross Domestic Product
INR	Indian Rupees
MoD	Ministry of Defense
MSME	Ministry of Micro, Small and Medium Enterprises
NIP	National Industrial Participation
OEMs	Original Equipment Manufacturers
OFB	Ordnance Factories Board
PSUs	Public Sector Undertakings
PPP	Public-private Partnership
R&D	Research and Development
SEZ	Special Economic Zone
ToT	Transfer of Technology

Key Metrics

1 Crore	10 Million (1,000,000) ~ USD 222,222.22
	(Assumed Exchange Rate 1USD = 45 INR)
1 Lakh	100 Thousand (100,000) ~ USD 2222.22
	(Assumed Exchange Rate 1USD = 45 INR)

Indian Chamber of Commerce

Founded in 1925, Indian Chamber of Commerce (ICC) is the leading and only National Chamber of Commerce operating from Kolkata, and one of the most pro-active and forward-looking Chambers in the country today. Its membership spans some of the most prominent and major industrial groups in India. ICC is the founder member of FICCI, the apex body of business and industry in India. ICC's forte is its ability to anticipate the needs of the future, respond to challenges, and prepare the stakeholders in the economy to benefit from these changes and opportunities. Set up by a group of pioneering industrialists led by Mr G D Birla, the Indian Chamber of Commerce was closely associated with the Indian Freedom Movement, as the first organised voice of indigenous Indian Industry. Several of the distinguished industry leaders in India, such as Mr B M Birla, Sir Ardeshir Dalal, Sir Badridas Goenka, Mr S P Jain, Lala Karam Chand Thapar, Mr Russi Mody, Mr Ashok Jain, Mr.Sanjiv Goenka, have led the ICC as its President. Currently, Mr. Jayanta Roy is leading the Chamber as it's President.

ICC is the only Chamber from India to win the first prize in World Chambers Competition in Quebec, Canada.

ICC's North-East Initiative has gained a new momentum and dynamism over the last few years, and the Chamber has been hugely successful in spreading awareness about the great economic potential of the North-East at national and international levels. Trade & Investment shows on North-East in countries like Singapore, Thailand and Vietnam have created new vistas of economic co-operation between the North-East of India and South-East Asia. ICC has a special focus upon India's trade & commerce relations with South & South-East Asian nations, in sync with India's 'Look East' Policy, and has played a key role in building synergies between India and her Asian neighbours like Singapore, Indonesia, Bangladesh, and Bhutan through Trade & Business Delegation Exchanges, and large Investment Summits.

ICC also has a very strong focus upon Economic Research & Policy issues - it regularly undertakes Macro-economic Surveys/Studies, prepares State Investment Climate Reports and Sector Reports, provides necessary Policy Inputs & Budget Recommendations to Governments at State & Central levels.

The Indian Chamber of Commerce headquartered in Kolkata, over the last few years has truly emerged as a national Chamber of repute, with full-fledged offices in New Delhi, Guwahati and Bhubaneshwar functioning efficiently, and building meaningful synergies among Industry and Government by addressing strategic issues of national significance.

About Aviotech

Aviotech is an initiative of the promoters of the Deccan Chronicle Group created to address the segments of Corporate Aviation and Defense & Aerospace Advisory and Investments. Its operations are spread across India and UK and has offices in Hyderabad, Delhi and London. Aviotech aims to provide its clients with information that empowers them to take informed decisions. It aims to support the initiatives of its clients through structured advice, consultancy and guidance.

Deccan Chronicle Group has interests across Media, Financial Services, Retail, Professional Sports Management, Information Technology, Aviation and Defense & Aerospace.

Aviotech Aerospace & Defense Advisory services

Aviotech Aerospace and Defense Advisory is focused on the global defense, space, government services, homeland security and commercial aerospace market.

Our clients are typically senior decision makers at the Board of Directors, CEO, CFO, sector president or investment partner level. We work with firms throughout the value chain, from component manufacturers to private equity/venture capital firms.

Aviotech Aerospace and Defense Advisory serves its clients in three core areas of Business Advisory:

- Market Assessment
- Manufacturing Advisory
- Offset and Policy Advisory

For further details, please visit www.aviotech.com

aviotech

Indian Chamber of Commerce

AVIOTECH

Aviation I A&D Advisory I Investments I Manufacturing I Training

India

Hyderabad

36 Sarojini Devi Road
Secunderabad – 500003

Gurgaon

202-206 , Sewa Corporate Tower
Sector 25, MG Road

UK

London

31A St. James Square
SW1Y 4JR

www.aviotech.com