Aerospace: Innovative Interventions Required

Intervention 1 : Formulation of National Aerospace Policy			
S.No.	**Tasks**	**Key Stakeholder**	**Innovation**
1	A National Aerospace Policy that is applicable to both the Civil & defense aerospace sectors needs to be formed. It should involve the following: • A working group needs to be formed involving people who have held significant positions in DRDO, HAL, NAL, BEL, defense PSUs and private players. • Integrate the existing stand-alone policies like : – Civil and defense offsets – Private sector participation in defense aerospace – Transfer of Technology – JVs between companies, etc. • Address some open issues like the civil offset and its applicability to private airlines purchases of planes, the roles desired of defense PSUs, RURs and SMEs in the development of the domestic aerospace industry, availability of government test laboratories and facilities for private sector, etc.	Ministry of Defense, Ministry of Civil Aviation	Knowledge Creation and Commercialization
Issues Targeted			
• The policy targets all the issues mentioned in the above section.			

Intervention 2 : Scheme for setting up aerospace economic zone			
S.No.	**Tasks**	**Key Stakeholder**	**Innovation**
1	A focused scheme needs to be formulated for setting up aerospace economic zone in the country. Various aspects of the scheme are: • Provide requisite infrastructure like air fields and traffic free air space. • Invite component manufacturers, aero-structure engineers and assemblers etc. to set up units in the cluster. • Attract an anchor OEM to bring much needed scale to India's component design & manufacturing sector. (Just as Embraer did for Brazil's aerospace industry). This can be done by undertaking defense offset program. (India is expected to procure about $100 billion worth of military aircrafts over the next decade, most of which will be imported. Government can think of mandating manufacturing of aircrafts in India under the offset policy. This will necessitate a crucial technology transfer by OEMs in Europe or US to India.) • Formulate direct as well as indirect subsidy schemes for players in aerospace economic zones. Direct subsidies can	Ministry of Commerce, Ministry of Civil Aviation	Knowledge Creation and Commercialization

	be in the form of cash incentives for the reimbursement of direct investment costs, incentives for labor and research and development (R&D) etc.; while indirect subsidies would be in the form of relief from land property taxes, tax exemptions on kerosene etc. • Focused scheme to encourage players to set up manufacturing units in growth areas like brackets & hinges, wiring harnesses, mountings, precision machining, sheet metal working, fasteners, blades and vanes etc. • Set up testing and certification labs of global standards (through technical collaborations) for all the aerospace components.		
Issues Targeted			
• Diffused nature of the Indian aerospace industry with all the big players being PSUs. All the small firms are mainly into manufacturing of tier-3 components. • Indian aerospace industry lacks in latest technology across the design lifecycle, which is a major obstacle in its growth and development. • FDI restrictions do not allow foreign companies a majority control in Indian entities, due to which they are reluctant to transfer state-of-the-art technologies and have given licenses only for older technologies.			

References:

1. **Development in Morocco's Aerospace Industry**

This sector in particular witnessed an unprecedented growth in Morocco. The need for the aerospace global industry to reduce costs led a number of companies to explore Morocco as a production platform. The number of companies has increased from a handful in 2000 to fifty today. Prestigious companies such as Labinal, Teuchos, Aircelle, DL Aerotechnologie, Safran Group, DAHER, EADS, Creuzet etc. have set up production units in Morocco. The aerospace activity is mainly located in Casablanca and Tangier. The Casablanca hub at the international airport is called "Aeronautic City". The industry in Tangier Free Zone is also expanding rapidly.

Today, the sector is made of 50 companies, provides 5000 jobs and has a $394 million. Within few years, Morocco has developed an aerospace industry hub that gathers a large scope of expertise such as studies surveys, mechanics and tooling, composites, assembly, distribution of chemical products, surface treatment, wire bundles, electric and electronic components, civil, military aircrafts and helicopters maintenance, engine maintenance, nacelles, aeronautic training. Most of these industries are EN9100 certified.

The fast development of this sector in Morocco prompted the organization of the first international exhibition in North Africa, bringing together major aeronautics players.

2. **Korean Aerospace industry growth & pursuit towards building Aerospace clusters**

With its T-50 Golden Eagle, South Korea joined a select club of nations to have successfully developed a supersonic aircraft. Quite apart from breaking the sound barrier, South Korea is hoping to also break into new export markets with its advanced jet trainer. Four task forces comprising civilian, government and military experts have been created to action these targets. The four groupings are a regional aircraft team; helicopter team; next-generation fighter team; and a maintenance, repair and operating (MRO) team. The MRO side will build upon existing service bases at Incheon and Cheongju International Airports.

Integral to this strategic 2020 plan are four major and far-reaching programmes: (1) utility military helicopter; (2) light/mid-weight attack helicopter; (3) cutting-edge next-generation fighter; and (4) regional 90-seat commercial jet. Midterm and long-term goals are elaborated in the Aerospace Industry Primary Plan (2010-2019) released in January 2010. Efforts are being made to create aerospace industry clusters in the specialist areas of aircraft production, research and development (R&D) and MRO. Aircraft production will focus on the southern Jinju/Sacheon area.

Since a European company and not a firm of the U.S., which was a traditional aircraft exporter to the Republic of Korea, was selected as the primary partner of KAI in the KHP, such countries as the U.K. and Germany are paying increasing attention to the Korean market.

Following the KHP, the KFX (a next-generation fighter development project) is to be implemented as a large-scale government project. Said countries are seeking to participate in the project as a partner.

From this perspective, the most realistic options identifies by Korea to attract foreign investment include pursuit of industrial-academic-research cooperation by encouraging foreign companies to set up R&D centres in Korea or pursuit of their indirect participation in the domestic defence/civilian aerospace industries through investment in and strategic partnerships with domestic businesses.

Intervention 3 : Improve raw-material competitiveness of the sector			
S.No.	**Tasks**	**Key Stakeholder**	**Innovation**
1	Focused scheme to induce indigenous production of critical raw-materials like high quality aluminum, titanium etc. The scheme will supplement the objectives of the Cluster Innovation Centres to bridge the demand-supply gaps in multiple aspects of a business and drive need-based innovation in the industry clusters in a localized manner, by prioritizing the needs of the industry and enable agencies like the Government and others in directing their efforts for increased efficacy. Some of the steps that may be adopted are: • Compile a list of critical raw-materials which have very limited domestic production. • Identify international companies present in the above product categories and encourage these companies to collaborate with Indian counterparts to create manufacturing facilities in India. Several measures that can be adopted for the same are : • Reduce or exempt investors from India's corporate	Ministry of Commerce, Ministry of Civil Aviation	Knowledge Creation and Commercialization

	income tax rate for 5-10 years. • Provide incentives for foreign players who are ready for technology transfer to Indian players. • Provide infrastructure support to shorten to ensure shorter time to market • Provide export subsidies to these units to ensure better access to export markets. This is required to ascertain profitability & scalability of these units. • Reduced excise duty on the identified materials to encourage indigenous raw-materials/component manufacturers to expand their capacities.		
Issues Targeted			
• Unavailability of critical raw materials such as aluminum, titanium, plastics etc. makes the sector dependent on imports • FDI restrictions do not allow foreign companies a majority control in Indian entities, due to which they are reluctant to transfer state-of-the-art technologies and have given licenses only for older technologies.			

Intervention 4 : Foster R&D and encourage more participation from private players			
S.No.	**Tasks**	**Key Stakeholder**	**Innovation**
1	Launch a national level scheme to encourage both academia & industry to target efforts in R&D. The scheme aims to create enabling environment for collaborative research between Industry and Universities/Public Funded Research Institutions; The scheme should target to implement the following: • Provision for funding up-gradation of R&D labs in the private and government sector with sharing basis for the lab up-gradation. • Incentive scheme to reward any breakthroughs in new product development by academia or industry. • Incubation centres for providing supportive framework for the researcher that enables him to turn a technological idea that has an economical-marketing potential into a product of interest for investors	Ministry of Science & Technology, Ministry of Civil Aviation	Knowledge Creation and Commercialization
2	Creation of innovation centres for conducting collaborative research on pay-per-use model. This may be done on PPP model with investments shared between central government, state government and private players. Some of the facilities that should be created are: • CAD/CAE/CAM tools • Testing chambers • Laboratories like wind tunnels and lightning strike facilities. • Simulation environments etc. • Incubation centres for providing supportive framework for the researcher that enables him to turn a technological idea that has an economical-marketing potential into a product of interest for investors	Ministry of Science & Technology, Ministry of Civil Aviation	Knowledge Diffusion & Absorption

Issues Targeted
• Lack of awareness of global standards for among Indian SMEs • Lack of joint R&D activities with foreign partners. • Indian aerospace industry lacks in latest technology across the design lifecycle, which is a major obstacle in its growth and development. • Lack of private sector participation from domestic as well as foreign players in research and development activities in aerospace sector

References:

1. **National Aerospace Centre of Excellence – South Africa**

The Department of Trade and Industry (DTI) formulated the National Aerospace Centre of Excellence (NACoE) in 2005 under a policy to establish industrial centres of excellence to provide specific support to specific emerging sectors to mitigate a skills shortage in the aerospace industry. The NACoE is the pilot project under the DTI's policy to see if such an initiative is viable. Since the establishment of the NACoE, the DTI has opened a number of similar, but smaller, centres. However, NACoE is leading the way in understanding how industry-university partnership models in the aerospace industry function.

The formation of the strategy, known as the Aerospace Industry Support Initiative, developed by the DTI, was an effort to fast-track the repositioning of the South African aerospace manufacturing industry to be firmly integrated into the international supply chains driven predominantly by large commercial airliner manufacturers Boeing and Airbus.

The DTI has committed itself to provide core funding for the NACoE for the initial five years to demonstrate the relevance of the centre, and for the NACoE to find new partners. The NACoE is hosted by the University of the Witwatersrand (Wits), but it is a national programme of the DTI, with some of the funding administered through the National Research Foundation on behalf of the department. It is also the only university in the country that has A-rated aeronautics research and state-of-the-art facilities.

NACoE Focus Areas

The NACoE has identified three fields that need attention in the aerospace industry, and the centre will fund skills development and industry-focused research around these fields.

- The first area is aeronautics, dynamics, modelling, simulation and control. This area is one where South Africa has significant potential to liaise with international companies. The focus is on the development of aircraft flight control systems, which include electronics and software. The area also entails software modelling and the development of aircraft.
- The second area of focus is aero- space manufacturing processes and materials, which include the advanced machining processes required for parts and components for aero structure manufacturing. Research in this field is vital to support the industry's future work, and the focus includes aero structure materials, such as composite materials and titanium alloys.
- The third field the NACoE focuses on increasing appreciation of the importance of industrial engineering in the aerospace industry. The centre believes that academic knowledge around industrial engineering should be more integrated into the aerospace industry, with specific models and tools to be developed in consideration of South Africa's unique challenges.

2. **Strategic Aerospace & Defence Initiative - Canada**

Canada's aerospace, defence, space and security (A&D) industries are major contributors to the national economy. In 2008, the aerospace sector alone had sales of $23.6 billion and employed 80 000 Canadians across the country. To support R&D in aerospace industry, government of Canada has launched Strategic Aerospace and Defence Initiative (SADI). The Strategic Aerospace and Defence Initiative (SADI) have three main objectives:

- To encourage strategic research and development (R&D) that will result in innovation and excellence in new products and services;
- To enhance the competitiveness of Canadian A&D companies;
- To foster collaboration between research institutes, universities, colleges and the private sector.

Strategic R&D projects under SADI will use technologies that either:

- Support the development of next-generation Aerospace & Defence (A&D) related products and/or services;
- Build on existing Canadian strengths in A&D technology development;
- Enable Canadian companies to participate in major platforms and supply chains; or
- Assist the A&D industries in achieving Canada's international obligations (e.g. development programs supported by Canada).

Types and Amounts of Contributions

SADI provides Canadian aerospace and defence (A&D) industries with repayable contributions for strategic R&D projects. ITO calculates the contribution amount for each project on the basis of it being the minimum amount of assistance required to ensure that the project proceeds successfully and generates benefits for Canadians. Contributions to SADI projects will equal approximately 30 percent of a project's total eligible costs. ITO is not required to distribute specific amounts of funding or percentage funding levels by region.

The Strategic Aerospace and Defence Initiative (SADI) have benefit Canadians in numerous ways:

Technologically, they have witnessed new materials; new information technologies and other innovations have also evolved. Regional diversification and economic development has energized an already healthy economy. Reduced greenhouse gas emissions and other new energy efficiencies have greatly help the environment, and safety, security and defence measures also have improved. This all has helped to enhance the quality of life for Canadians, and provided value for money.

These benefits will be measured both during the lifespan of the project and once SADI contributions end.

Benefits will vary, depending on each of the projects approved under SADI. However, individual Canadians and companies stand to inherit new skills, knowledge and capabilities. New or improved technologies are also likely to come to the fore, benefiting suppliers who have participated in the project.

Intervention 5 : Strengthen testing & certification infrastructure and encourage adoption of global standards by Indian aerospace components			
S.No.	**Framework for Innovation**	**Key Stakeholder**	**Innovation**
1	Launch a scheme to set up Joint testing and certification facilities for certification of Indian manufactured components and parts exported internationally – This will enable Indian products to enable faster registration and later continued exports sustainability due to building of mutual trust in respect of quality of components imported as certified by the joint facilities. The steps to be taken for the same are: • Develop MoUs for mutual partnership at Inter-governmental level. • Designate a SPV for implementation of joint testing & certification facilities. • Invite participation of private players to set up the joint testing facility. PPP model should be adopted for the same.	Ministry of External Affairs, Directorate General of Civil Aviation	Knowledge Diffusion and Absorption
2	Focused scheme for creating awareness among SME's for quality standards followed for various components & products in India and by global OEMs. Various activities that may be performed for the same are: • Arrange for training/awareness programs targeting all the SSI. • Tie-ups with financial institutions like SIDBI to provide soft loans for SSI units who are willing to upgrade to conform to global standards.	Directorate General of Civil Aviation	Knowledge Diffusion and Absorption
Issues Targeted			
• Lack of awareness of global standards for among Indian SMEs • Inability of smaller suppliers to keep abreast with the rising quality issues • International airworthiness approvals for parts manufactured in India takes very long time as approvals are not done within the country. The delay in approvals often leads to high costs for OEMs, which deters the outsourcing of components to Indian suppliers			

Intervention 6 : Provide database & technology support to domestic firms			
S.No.	**Framework for Innovation**	**Key Stakeholder**	**Innovation**
1	Provide database & technology support to domestic firms in the following areas: • Quality standards followed globally for various components & products in India. • Technology- and innovation-related international journals from major publishers. • Country wise/OEM wise SOPs for testing the products. This will include testing labs availability and tests conducted by them, fees for conducting the tests etc. • Database of industry experts (either retired or from the industry) who can be contacted by SME's for any kind of technical support required. For the same, profiles of the	Ministry of Science & Technology	Knowledge Diffusion and Absorption

	experts need to be invited and kept in a repository. On receipt of any request from the industry, communication can be sent to the relevant experts and the interested ones can then be suggested to the requestor.		

Issues Targeted

- Lack of awareness of global standards for among Indian SMEs
- Inability of smaller suppliers to keep abreast with the rising quality issues
- International airworthiness approvals for parts manufactured in India takes very long time as approvals are not done within the country. The delay in approvals often leads to high costs for OEMs, which deters the outsourcing of components to Indian suppliers