

Shared Horizons



A Biannual Publication of the US-India Aviation Cooperation Program



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DR. DINESH KESKAR

ACP Co-chair (Industry) and
President, Boeing India



AARON E. WILKINS III

ACP Co-chair (USG) and
FAA Senior Representative

We are proud to deliver the third issue of "Shared Horizons". This edition covers our focus and progress in 2011 and also gives you a peak into the future.

The U.S-India, Aviation Cooperation Program (ACP), a public-private partnership between the U.S. Trade Development Agency (USTDA), the U.S. Federal Aviation Administration (FAA) and U.S. aviation companies, has been established to provide a forum for unified communication between the Government of India and the U.S. public and private sector entities in India.

ACP's projects and events cover a broad area of Air Traffic Management and its regulatory aspect, aerospace industry, particularly manufacturing of aircraft spares and its certification process and best practices for aviation cooperation between India and the US. The ACP mission is to further support the growth of the Indian civil aerospace sector through projects that encourage collaboration between the US and the Indian industry.

In the year 2010, ACP has completed Helicopter Aviation Safety Technical Assistance, and started Technical Training for the Aerospace Industry. Technical, Management, and Operational Development Training and AAI ATCO capacity assessment grant offer as well as contract agreement has been signed. GBAS Pilot project at the Chennai airport and other approved projects have also gained traction and are currently with USTDA for approval.

The ACP is a working mechanism through which the Indian aviation sector officials can work with U.S. civil aviation representatives to highlight specific areas for technical cooperation. The ACP executive committee consists of both U.S. Government and US industry (private sector) representatives, and its secretariat will function as the focal point for responding to Indian Government areas of interest, i.e. aerospace and aviation sector by identifying appropriate training programs, technology updates and other cooperative activities as well. The ACP secretariat will be responsible for managing and organizing the identified training and technical cooperation activities.

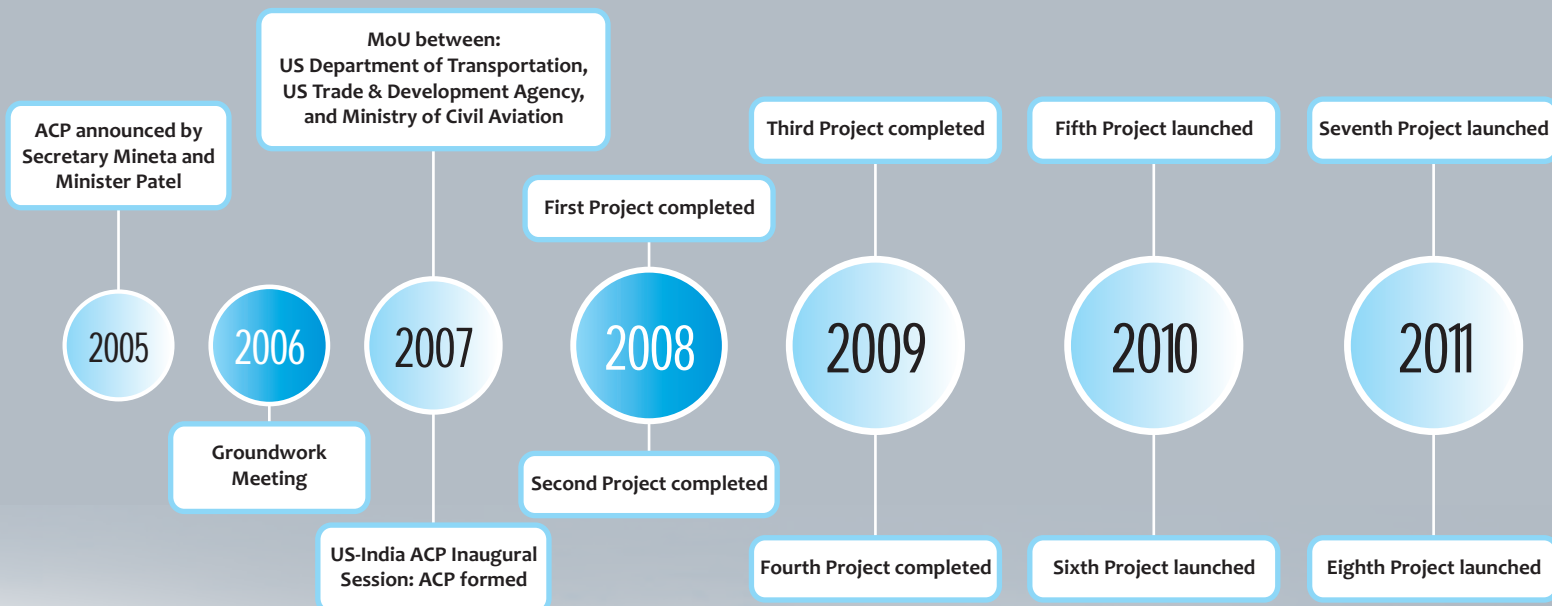
ACP is built on the pillars of technical support from the US Federal Aviation Administration, financial backing of the US Trade and Development Agency and stakeholders, and the instrumental participation of over 30 companies from the US industry. But the ACP's anchor is its customers within the Government of India and the leadership within the Ministry of Civil Aviation, Director General of Civil Aviation, and Airports Authority of India. For their partnership, we are deeply grateful.

We are encouraged by what lies ahead of us and are enthusiastic about our future as an association. The "Shared Horizons" ahead looks truly limitless.



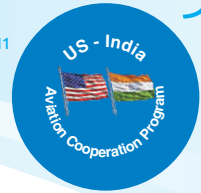
January-June 2011

HISTORY



FOCUS AREAS

- Air traffic management modernization
- Airspace and airport analysis, development and planning
- Aviation support industry development
- Aviation human resources
- Aviation safety
- Aviation security



OBJECTIVES

- Promote greater engagement between the US and the Indian Government agencies and industry to enhance civil aviation in India
- Undertake projects that advance cooperation in domain, such as aviation safety, security, regulatory oversight and management
- Provide training and technical assistance to accelerate excellence in aviation operations
- Within India, increase awareness of, and facilitate access to, US expertise, technology and best practices to assist India's aviation growth

MISSION

The US-India Aviation Cooperation Program (ACP) was established in 2007 as a public-private partnership between the U.S. Federal Aviation Administration (FAA), the U.S. Trade and Development Agency (USTDA), other U.S. Government agencies and the U.S. companies.

The ACP supports growth of the Indian civil aerospace sector by working directly with the Government of India (GOI) to identify and execute projects that encourage partnerships between the U.S. and Indian stakeholders, in aerospace technology and best practices.



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The aviation industry is entering a period of rapid technological advances that will challenge the capabilities of aviation manufacturers to innovate and growth of regulatory agencies to manage and oversee

these developments for robust growth. So it is important that before we certify we must understand the technology”

Mr. A. K. Saran,
Joint Director General, DGCA

“



I am glad that you with your network of people bring others into this program which is a major program of the country that we are going to launch and it is at a very initial stage, the feasibility study of which

has been prepared and submitted and will shortly begin with design and manufacture.”

Dr. M. R. Nayak
National Aerospace Laboratories

Indo-US Aviation Manufacturers Meet

26 April, New



L-R Dr. M R Nayak, NAL, Advisor, National Aerospace Laboratories; Dr. Dinesh Keskar, Joint Director General, DGCA; Aaron Wilkins, Senior Representative South-east Asia F Commerce and Dr. Kalpana Jain, Vice President (Education a

The Indo-US Aviation Manufacturers Meet - 2011 highlighted the need for the present infrastructure and aviation manufacturing industry, to collaborate with the US-India Aviation Cooperation Program (ACP) to harmonize the growing opportunities offered by the ever-growing Indian aviation market. As a part of this harmonization process, the ACP concept was given a shape in order to bring US Original Equipment Manufacturers (OEMs) and Indian suppliers to a common platform to facilitate Indian aviation manufacturing industry to come up to the same level of advancement.

US Aviation Manufacturers Meet - 2011 April, New Delhi



ies; Dr. Dinesh Keskar, VP Boeing International & President, Boeing India; A. K. Saran, tive South-east Asia FAA; Atul Sharma, Regional President. Indo-American Chamber of president (Education and Training) Honeywell Aerospace India

Aaron E. Wilkins III, Chairperson of Federal Aviation Administration (FAA) in India and South-east Asia, came to honor the meet. Representatives of DGCA, Airports Authority of India (AAI), Indian aviation manufacturers, Hindustan Aeronautics Limited (HAL) and National Aeronautics Limited (NAL), along with members of the mushrooming aviation manufacturing subsidiaries, were among the participants. Apart from the above, independent researchers, scholars and members of the industry, keen to become a part of the aviation sector, also showed great interest and came to interact with the forum.

“ HAL has design and development capabilities, state-of-the-art manufacturing technologies and industrial infrastructure. Establishment of design and manufacturing infrastructure has helped in taking up new design and development of aeronautical products. Based on these available capabilities, HAL took up the design and development of indigenous Advanced Light Helicopter (Dhruv) for military and civil applications.”



R.K. Mittal
Hindustan Aeronautics Limited

“ The world needs new technology, for breakthrough performance, for affordability and to make things better - more efficient and requiring less service. Technology is needed also for environmental concerns – biosphere, endurance, sustenance to have things last as much as they can. In terms of global cooperation, the environment in India, today, is more conducive to growth than any part of the world – and that is not surprising. Then, we are also seeing the Public - Private Partnerships, as we have seen in Delhi, so also growth is expected in the secondary airports - this growth will continue to happen.”



Dr. Dinesh Keskar
ACP Co-chair (Industry) and President
Boeing India



Various speakers enlightened the participants by voicing their company's core competence and future plans in the light of the opportunities and challenges the Indian aviation industry offers. Some of the prominent speakers are Atul Sharma, Regional President, Indo-American Chamber of Commerce; Aaron Wilkins, Senior Representative South-east Asia FAA; Dr. M. R. Nayak, NAL; Dr. Dinesh Keskar, VP, Boeing International & President, Boeing India; A. K. Saran, Joint Director General, DGCA; Kanu Gohain, Former Director General of Civil Aviation; Pritam Bhavnani, President, Honeywell Aerospace India; Hilol Biswas, Deputy Director, DGCA; Ajay Kumar, Civil Aviation Specialist, FAA; William Blair, President, Raytheon India and Raytheon International Inc. and R. K. Mittal, Consultant (Certification), Rotary Wing Research and Design Center, Hindustan Aeronautic Limited.

Hi-Tec an ACP member, has been assigned the task of assessing the Indian aviation manufacturing industry with respect to

- Human Capacity Building
- Technology Transfer and Productivity Enhancement
- Market-Oriented Reforms
- Infrastructure and Industry
- Any other developmental benefits of the project, including any spin-off or demonstration effects.

As to meet the above - stated objectives, Hi-Tec took the lead and approached the manufacturing industries in person, through correspondence and in order to provide an impetus to this drive, conducted an "Indo-US Aviation Manufacturers Meet" which has received an overwhelming response from all corners of the Indian aviation industry.



L-R Thomas P. Trueman, Vice President, FAA Programme; K P Srivastava, Director DGCA; Kanu Gohain, Former Director General of Civil Aviation; Pritam Bhavnani, President, Honeywell Aerospace India and Hilol Biswas, Deputy Director, DGCA.



From the observations and highlights made by the distinguished speakers, particular attention was drawn to the following aspects / areas where steps need to be taken at the level of policy, required coordination between Indian institutions, initiatives required of the government, institutions and individual or industrial enterprises; as opportunities from possibilities and potential latent in India's environment being a natural and eventual destination for leading global enterprises:

1. Manpower development needs
2. Certification and high - end appraisal infrastructural needs
3. Data coordination and single sourcing the unification of knowledge to meet future needs
4. Industrial investments from existing infrastructure to create high - end capabilities and capacities
5. Changes required in policies or creation of institutions to meet the needs spelt out for transfer

of technology and for generating export business

6. Determining the changing parameters required



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Metron Aviation: ATFM Pioneer bringing in Next - Generation Solutions for the Global Aviation Community

Metron Aviation: ATFM pioneer bringing in Next-Generation Solutions for the Global Aviation Community

Founded in 1995, Metron Aviation pioneered the advancement of Air Traffic Flow Management (ATFM), working with the FAA to develop the industry's first Collaborative Decision - Making (CDM) platform for optimizing system-wide traffic flow, which offered significant economic and environmental benefits to the aviation community. Metron Aviation provides concept engineering, advanced research, software development, traffic flow management, surface operations management, airspace design and environmental analysis solutions to the global aviation industry. Metron Harmony, Metron Aviation's commercial product, provides integrated ATFM and CDM capabilities for the world's leading Air Navigation Service Providers (ANSPs), airlines and airports.

Most recently, Metron Aviation has been selected by Thales to perform advanced research and development work on the Single European Sky ATM Research program (SESAR). SESAR is the European program for Air Traffic Management (ATM) infrastructure modernization, which aims to develop Europe's next-generation air traffic control system. As announced last

Metron Aviation's Integrated ATFM (I-ATFM) solution, Metron Harmony, provides ANSPs, airlines and airports with an automated ATFM system with Collaborative Decision - Making (CDM) capabilities for improving efficiency, reducing delays and enhancing predictability from gate-to-gate.



year, Metron Aviation was also selected as the Federal Aviation Administration's (FAA) prime contractor on the Systems Engineering 2020 (SE-2020) Research and Mission Analysis Set-Aside. SE-2020 is the FAA's strategic program for implementing the Next - Generation Air Transportation System (NextGen).

Metron Aviation's Integrated ATFM (I-ATFM) solution, Metron Harmony, provides ANSPs, airlines and airports with an automated ATFM system with Collaborative Decision - Making (CDM) capabilities for improving efficiency, reducing delays and enhancing predictability from gate-to-gate. Metron Harmony solutions are currently being deployed globally, to contribute in global harmonization. Metron Harmony stakeholder solutions include:



- Metron Harmony for ANSPs: enables ANSPs to balance airspace and airport demand and capacity.
- Metron Harmony for Airlines: provides airlines with an integrated view of real-time and predictive air traffic conditions, along with airport surface operations.
- Metron Harmony for Airports: gives airports complete situational awareness of surface operations and provides predictive decision support tools.

Metron Aviation's vision for Metron Harmony is consistent with the ICAO Procedures for Air Navigation Services – Air Traffic Management – Doc 4444 key terminology and concepts. From a CDM perspective, the solution covers both European Airport CDM and the FAA CDM process. Metron Harmony is a system-wide, full spectrum approach to addressing the complex operational issues facing air transportation service providers and users. The most significant aspect of Metron Harmony is the realization of gate-to-gate I-ATFM, including CDM functionalities, through the active engagement of system stakeholders across the aviation community. Specific displays, system interfaces and business rules encourage information sharing between active participants, including ATC facilities, airlines, airport operators and the flying public. Metron Harmony supports and optimizes decision-making by providing the right information to the right people at the right time.

In addition to the technology impacts, there are cultural and political implications to effective implementation of CDM-based I-ATFM. Metron Harmony supports not only the vision, but also recognizes that transition is necessary from current operations to an I-ATFM system. Transition from - and integration with - legacy systems can be accommodated by Metron Harmony. Also, determining operational concepts, participants and roles and responsibilities of the CDM stakeholders is also supported by Metron Aviation and a staff of experienced technologists, operational air traffic

management personnel, ANSP service professionals and airline operations personnel.

Metron Harmony has been successfully deployed by South Africa's ATNS and Australia's Air Services. South Africa's ATNS Central Airspace Management Unit (CAMU) looked for proven ATFM solutions that could dynamically balance capacity and demand, while providing a CDM capability to allow airlines to most effectively utilize available capacity for the maximum benefit of their business, operations and passengers. Metron Harmony provides the CAMU with comprehensive I-ATFM capabilities to model and implement all traffic flow initiatives for both aerodrome / airport and airspace volumes in South Africa. Traffic flow initiatives are used to dynamically balance air traffic demand with capacity to keep traffic flowing as smoothly and efficiently as possible.

Air Services Australia uses Metron Harmony to execute its core CDM process with the airlines in Australia, in addition to regional coordination to enhance the capacity, efficiency and safety of the Australian airspace. Metron Harmony will be used to manage traffic flow and capacity for all controlled airspace, including those flights originating from outside of Air Services Australia's area of responsibility and entering Australian airspace. Metron Harmony provides CDM capabilities for Air Services Australia's operations groups, airlines and regional stakeholders. Metron Harmony is deployed at the National Operations Center (NOC) in Canberra, control towers, area control centers and airline operations centers as well as being used by Australian military units.

With the continued growth of domestic, regional and international traffic in India, the Airports Authority of India (AAI) made a long-term plan to deploy ATFM in its organization. Metron Aviation's ATFM vision addresses strategic, pre-tactical and tactical phases of ATM performed by the ANSP, in collaboration with airlines and airports, recognize that the fundamental functions associated with I-ATFM apply to all authorities and phases. Metron Aviation is dedicated to supporting the successful adoption of an ATFM system in India.

For more information, please visit www.metronaviation.com.



Changing the Way We Fly

Benefits for airlines, travelers, communities,
the environment

By Steve Fulton

Air traffic is expected to nearly double during the next two decades, raising public concern over not only the environmental impact but also how airspace capacity around airports will need to increase. This latter aspect also raises concerns over increased noise pollution and emissions around airports. In addition, industry has its concerns too in that the current ATC systems will not be able to accommodate the projected increase, in air traffic.

Thankfully, all of the above issues are being addressed by two programs that are in the process of revamping ATM (or "modernizing the skies"). These programs are, in the U.S., the FAA's Next Generation ("NextGen") Air Transport System and, in Europe, the Single European Sky ATM Research' (SESAR) program.

NextGen & SESAR

The FAA's NextGen is an umbrella term for the transformation of the USA's National Airspace System (NAS). It includes a shift from a ground-based system of ATC to a satellite-based system of ATM. This shift is made possible through the deployment of aviation-specific applications for existing, widely-used technologies (such as GPS) and the latest innovations in areas such as weather forecasting, data networking and digital communications.

In Europe, the SESAR program – cited as one of the most ambitious research and development projects ever launched by the European Community (EC) - has similar goals and plans for achieving them to provide a Single European Sky.

In some respects, SESAR's challenges are a little greater than NextGen's as the formation of a single "European sky" clearly requires collaboration between several countries, each with its own airspace administrator. However, progress is being made, and at a pace. In March this year, at the ATC global exhibition in Amsterdam, the SESAR Joint Undertaking (JU) presented the first components of its future European ATM system.

These components include a number of validation exercises that will cover: efficient and green terminal airspace operations, end-to-end traffic synchronization, and integrated and collaborative network management.

Improving Performance

A fundamental aspect of the modernization of airspace is a move toward Performance-based Navigation (PBN) - a broad term used to describe a number of technologies (with varying levels of benefit) that allow aircraft to fly more flexible and accurate three-dimensional flight paths.

By making greater use of equipment on-board large commercial aircraft, most notably the Flight Management System (FMS), PBN technologies free aircraft from their reliance on fixed, ground-based radio-navigation aids.

For example, one form of PBN is Area Navigation (RNAV). On-board equipment calculates direct navigation paths between points without the aircraft having to overfly intermediate, ground-based navigation aids. While RNAV paths are typically limited to straight lines, they represent an improvement over conventional, ground-based navigation.



Another form of PBN is Required Navigation Performance (RNP) in which the aircraft's on-board navigation system provides performance monitoring and alerting, allowing the aircraft to fly precise, three-dimensional trajectories. There are different types of RNP and one of the simplest (known as RNP APCH) provides instrument approaches to runways that do not currently have adequate ground-based navigation facilities. Or, they can be used to back up existing ground-based navigation procedures.

The highest performing type of PBN is the RNP AR (also known as RNP SAAAR, which stands for Special Aircraft and Aircrew Authorization Required). An RNP AR path is typically crafted to reduce track miles, conserve fuel, preserve the environment, and increase airspace capacity.

RNP AR procedures require specific aircraft functionality and pilot crew training in order to be used. They are extremely accurate, though. For example, in a trial in Brisbane, Australia aircraft flying optimized RNP AR paths demonstrated that they can adhere to a lateral path of plus or minus 70 feet, i.e. less than the wingspan of most aircraft.

This kind of navigation accuracy and performance will, ultimately, allow air traffic controllers to safely reduce spacing between aircraft and will help reduce air traffic congestion and delays. In addition, because RNP delivers precise, yet flexible guidance to a runway, independent of ground-based navigation systems (such as ILS) operation airport operation becomes almost "all weather".

In fact, RNP's complete independence of ILS was demonstrated clearly late last year when RNP flight paths at Lijiang, China, prepared by GE Aviation's PBN Services, enabled Sichuan Airlines and Air China to maintain reliable commercial air service at the airport during an ILS outage. Were it not for the RNP paths, the loss of the ILS would have prevented aircraft from landing at Lijiang during periods of low visibility and when the cloud ceiling was below 1,200 feet.

Decisions Ahead

One result of RNP implementation is that the approach path flown by aircraft will need to change in order to improve efficiency and environmental performance. In the U.S. to date, many of the new RNP procedures deployed have been "overlays" of existing ILS approaches, including the long, straight final approach segments that characterize those procedures. But these overlays, or "mirrored approaches", don't access the full potential of RNP to reduce emissions and noise while improving airport efficiency.

RNP is not limited to straight-line paths, and many of RNP's benefits derive from the ability to design curving paths along a shorter route or to tailor the path to overfly less noise-sensitive areas, such as motorways, rivers and industrial areas.

This is in sharp contrast to the traditional way of managing air traffic, which is through instrument arrival procedures under which airplanes are vectored by ATC through a series of straight-line, vertical step-downs. Much of the step-down approach is conducted at sub-optimal altitudes, with flaps extended and engines revving to overcome aerodynamic drag. As such, noise is exacerbated by the required engine thrust and also greater aerodynamic noise from the airframe.

Also worthy of note is that the aforementioned trials in Brisbane results were conducted in a mixed equipage traffic environment. Air traffic controllers were able to clear an RNP-capable Qantas fleet for the optimized RNP procedures without disrupting traffic flying the older, conventional instrument procedures. In other words, the experience in Brisbane shows that it is possible to derive benefit from RNP today, without having to wait for 100 percent participation.

Airports have a role to play

In summary, an RNP procedure is a clearly defined path through three-dimensional space. The successful deployment of PBN procedures though involves complex airspace integration with careful consideration of all stakeholders, including ATM organizations, operators, regulatory authorities, airports and communities.

Regarding the last of these, airport managers know



their communities better than anyone. Once they have become familiar with RNP, and what it has to offer, they can work with the communities they serve, the aviation authorities and third-party RNP procedure designers.

Regarding the third-parties, in the past, public-use, instrument flight procedures in the U.S. (for example) were designed and deployed exclusively by the FAA. Today, with an increasing demand for more efficient, environmentally sensitive airspace procedures, the agency is straining to keep pace with the demands to build new paths while maintaining old ones. Fortunately, the FAA has authorized a few commercial third-parties, such as GE Aviation, to work with air traffic controllers, airports, airlines and communities to deploy public RNP paths in the U.S.

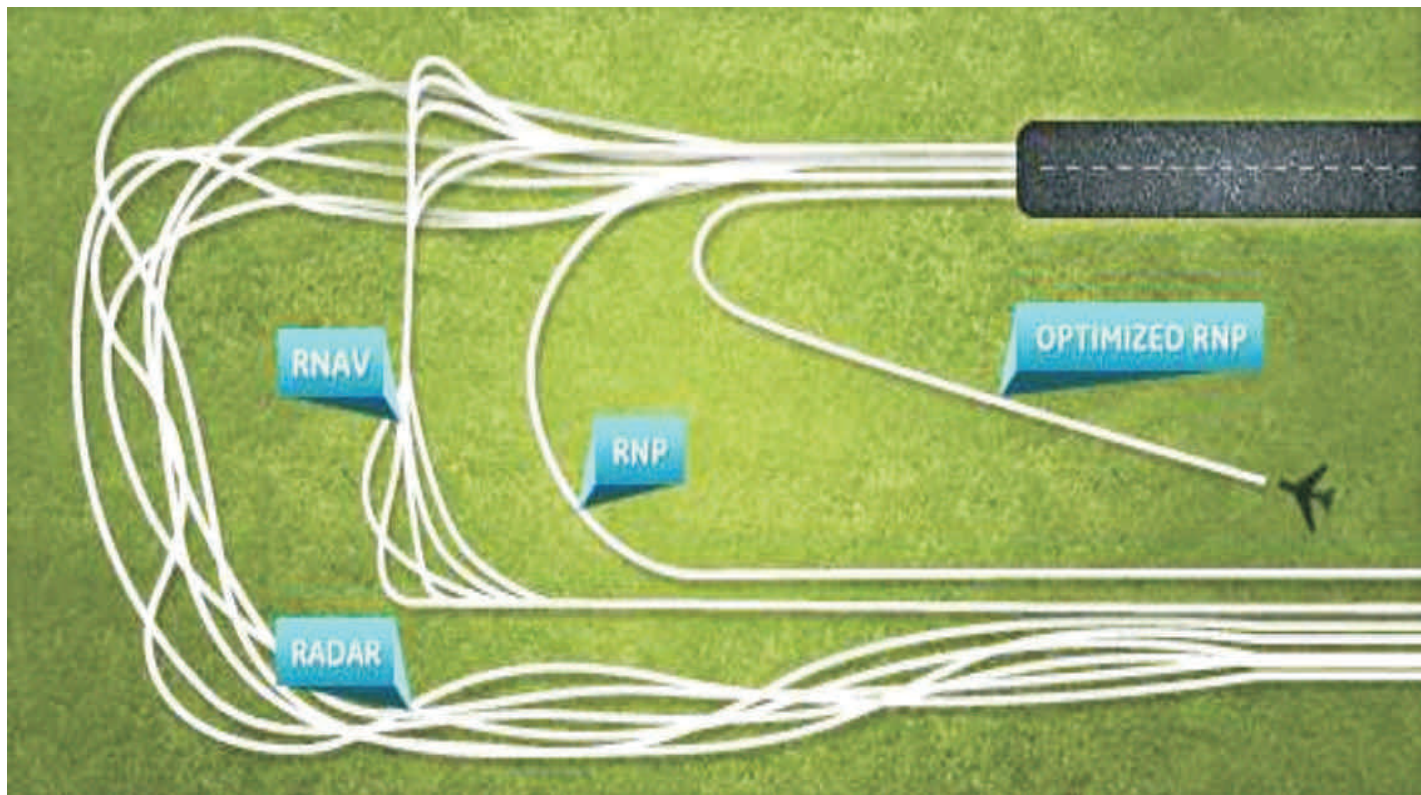
Indeed, GE's PBN Services group has designed and deployed 340 high-performance RNP procedures that are currently in active use in six other countries around the world, making it the largest and most experienced

RNP services provider. And, as mentioned, RNP flight paths can provide immediate benefits and be introduced into a mixed-equipage environment.

RNP in action

In Brisbane, Australia, a medium-density international airport, new RNP flight paths enabled the Qantas fleet of 737s to significantly reduce noise impact on the community by altering the course of the aircraft so they overflow rivers and industrialized areas of town, away from more densely - populated residential areas. The procedures also reduce carbon dioxide emissions by an estimated 1.1 million kilograms during the first 18 months of operations, according to Airservices Australia, the air navigation service provider there.

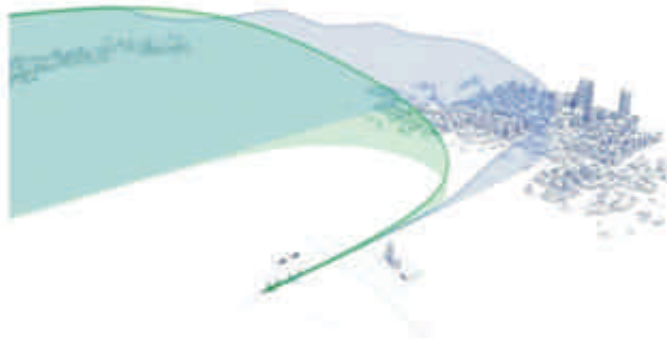
View from above



This diagram illustrates the key differences between conventional navigation approach paths (represented by the Radar Vectors lines), an RNAV approach path, and RNP and Optimized RNP paths.



The Green Approach



A traditional approach to a destination airport (shown in blue) is stepped, with each leveling-off requiring thrust, is wasteful of fuel and noisy. Also, viewed from above, a traditional approach is far from straight.

RNP paths can be described so as to define a continuous-descent arrival (CDA, also known as the “Green Approach”) which is extremely fuel-efficient as most of the descent is done with engines at idle. Indeed, thrust need only be applied in order to deploy flaps and the landing gear near the runway.

Optimization on the Ground

The revamping of ATM will enable fundamental improvements to airport infrastructure and procedures to be made. For example, under current ATM practices, a destination ATC has only an approximate idea of any aircraft's ETA. The coincidental arrival of expected and delayed flights results in a peak throughput of passengers; and many ground-based activities (such as baggage handling) therefore, tend to be “sized” to cope accordingly.

Under the revamped ATM, arrival time conflicts can be detected much earlier, and aircraft can be issued (at any

point of their flight) with a Required Time of Arrival (RTA).

Rising to the Challenge

In recent news, a Brazilian airline has selected GE Aviation's PBN Services to assist them in obtaining regulatory authorization to fly RNP flight procedures in Brazil. Once approved, the airline will be allowed to fly RNP paths in its fleet of Boeing 737s, reducing fuel consumption and emissions while increasing airspace capacity.

One pressing reason for the switch to RNP is that Brazil's air traffic is expected to double, from its current four million passengers per month to eight million by 2014, according to a 2009 KPMG estimate, UK trade commission report. The country is hosting the World Cup in 2014 and the Olympics in 2016, which could place major challenges on Brazil's capacity-limited air traffic management system.

Where, When & Why

While in the U.S. and Europe, legacy navigation architecture presents some challenges to the unfettered deployment of PBN, nations that are currently building new navigation infrastructure or rapidly - expanding an existing one, have the advantage of starting with a clean sheet of paper.

Over the next few years, regions of the world such as China, India, Africa, South America and the Middle East, which anticipate rapid aviation growth, have the ability to deploy efficient, environmentally-sound PBN-based navigation architecture to accommodate that growth.

The roll - out of PBN and associated construction of RNP paths, in these areas can, in theory, be much easier and quicker than is the case in regions where a mature, legacy navigation infrastructure is already in place. Moreover, RNP's flexibility means it can be adapted as air traffic requirements change.

Author profile

Steve Fulton is a Technical Fellow at GE Aviation and was the co-founder of Naverus, Inc. in 2003; the root of GE Aviation's PBN Services. Prior to this, in his former capacity as technical pilot at Alaska Airlines, Mr. Fulton was instrumental in the development of the world's first commercial RNP AR instrument approach procedure at Juneau, Alaska.

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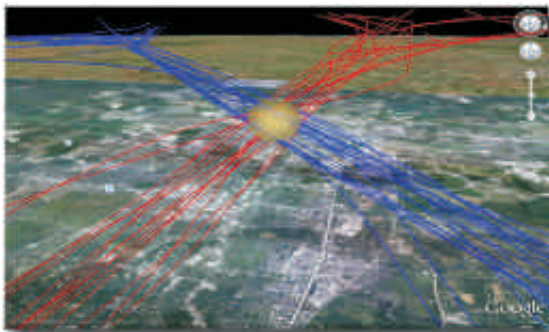
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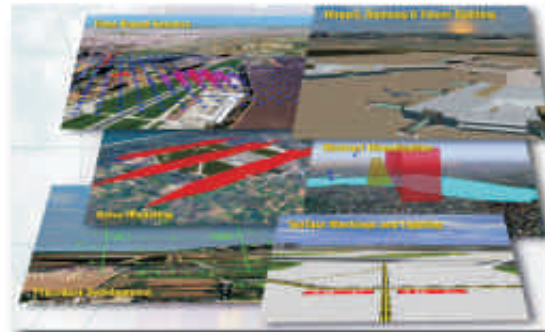
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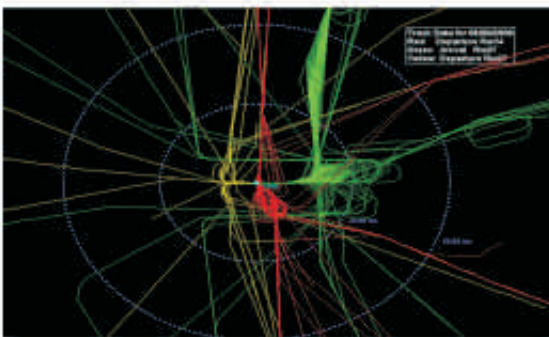
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– **Ted Gavrilis**, Former President
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American Airlines, Inc. (AA), a subsidiary of the AMR Corporation, is the third-largest airline in the United States by traffic, serving 250 cities in 40 countries worldwide with, on average, more than 3,400 daily flights.

India Operations

Starting in November 2005, American is set to complete 5 years of operations in India with conveniently timed daily nonstop overnight services to Chicago, offering swift onward connections to some 150 destinations throughout the Americas. Flights are operated with B777-200ER aircraft, offering 3 classes of service, including the Flagship Suite in First Class, new lie-flat seats in Business Class, and entertainment-on-demand in all three cabins.

American Airlines has maintained its commitment to providing a slew of quality products and services that its customers value in an effort to enhance the travel experience. For this reason, American Airlines has continued its focus on investing in the travel experience for international premium travelers – many of whom are frequent travelers on American.

In-Flight Services

Ensuring optimum passenger comfort during the flight, the airline strives to offer discreetly attentive service and enough space to relax, work or sleep. The onboard entertainment facilities include an in-seat personal video system in First and Business Class with choices of films, TV programs, custom audio programs and video games for both the classes. The Overhead monitors in Economy Class, play a wide variety of programs including 2 Bollywood channels especially for the Indian sector.

With an award-winning First Class Wine Cellar and an in-flight menu created by the American Airlines Chefs' Conclave, the meals served in American Airline flights are carefully chosen keeping in mind the passenger needs and tastes. The selection of food is based on regional preferences and local tastes. The airline offers a choice of Indian meals on all its Delhi-Chicago flights with a menu that has been finalized in consultation with the American Airlines 'Indian Employee Resource Group'. In First and Business, the airline also offers the option to choose meal times. There are a variety of entrees from which to choose and the Dine Upon Request® service allows those with work to enjoy all of the meal items at the same time.

Of course, there's far more to an American Airlines flight than touching down at the final destination. The airline prides itself on its outstanding and innovative service before, during and after your flight. In India, American Airlines offers Premium Class Passengers access to the Kingfisher Lounge, at the new terminal 3 of The Indira Gandhi International Airport, New Delhi.

AAdvantage® program

The AAdvantage® program is American's travel awards program. It was the original travel awards program, established more than 25 years ago, and today is the world's largest program. AAdvantage members earn mileage credits by flying on American Airlines, American Eagle, AmericanConnection carriers and oneworld carriers, as well as other participating airlines. Members also earn mileage credits by purchasing products and services from more than 1,000 participating non-airline businesses, including car rental, hotel, telecommunications and financial service companies.

American Airlines continuously focuses on its ability to develop and deliver a high-quality travel experience – built around products, services, routes and exceptional customer service – which continues to be a focal point for the airline's progress and service culture.



Bell Helicopter - India Operations

Bell Helicopter started its operations in India in 1995 by setting up a liaison office in New Delhi. The fleet has grown from two helicopters in 1994 to 115 as of today. Since selling its first helicopter into India back in 1956, Bell has delivered a variety of models to India and has grown its market share to be the leader with over 42% of the commercial market. Bell Helicopter is the world's leading helicopter manufacturer in the world and the trend follows in India. The company dominates both in the single and the twin engine fleets in India. The USP of Bell is Safety and World's Best Customer Support. (Professional Pilot magazine has voted for Bell #1 in Customer Support for 16th year in a row).

The ownership of Bell helicopters in India is distributed amongst corporate houses, State Governments and operators. The major corporate houses owning Bell helicopters are Escorts, Arki Aviation, Hindustan Construction, Reliance Industries, ESSAR, Bharat Forge, Punj Lloyd, Garware Wallrope, Raymond, VSL Mining, and Jai Prakash Industries, Abir Construction, GMR, Navyuga Engineering, among others.

State Governments of J&K, Madhya Pradesh, Uttar Pradesh, Tamil Nadu and Andhra Pradesh also own Bell helicopters. Private operators include Span Air, Global Vectra Helicorp, United Helicharters, Deccan Aviation and Transbharat Aviation.

Bell 407 is the fastest-growing single engine helicopter fleet in the world and the trend follows in India. There are more than 1,000 Bell 407s flying all over the world and 33 of them are operating in India. Bell 407 is the first Indian aircraft (of Pawan Hans Helicopters) and world's first 407 to fly in Antarctica in Jan 99. Bell 407 has landed at the density altitude 23,000 ft. in India.

The Bell 412 offers operators the highest dispatch reliability of any twin-engine and is designed with rupture-resistant fuel cells, energy-absorbing crew seats and a resilient fuselage. With rugged military-grade components and exceptional utility operations the 4-bladed Bell 412 employs high cruise speeds and low noise signatures. Since its inception in 1981, advancements in technology have yielded 412 upgrades with greater performance and endurance, making it one of the most mission-ready medium utility helicopters available in the market.

Bell Helicopter, a Textron Inc. (NYSE: TXT) company, brought its 429, the world's newest helicopter, in India to demonstrate its best-in-class capabilities to customers attending India Aviation 2010. Bell pilots introduced customers and government officials to the 429's state-of-the-art cockpit, spacious cabin and powerful flight performance. The 429 was certified in 2009 to the latest safety standards and its maintenance program is unmatched among helicopters.

Jubilant Enpro Ltd is the sole Independent Representative and Air Works Engineering India and Deccan Technical Services are the appointed Customer Service Facilities.

About Bell Helicopter

Bell Helicopter, a wholly-owned subsidiary of Textron Inc., is an industry-leading producer of commercial and military, manned and unmanned vertical-lift aircraft and the pioneer of the revolutionary tiltrotor aircraft. Globally recognized for world-class customer service, innovation and superior quality, Bell's global workforce serves customers flying Bell aircraft in more than 120 countries

About Textron

Textron Inc. is a multi-industry company that leverages its global network of aircraft, defense, industrial and finance businesses to provide customers with innovative solutions and services. Textron is known around the world for its powerful brands, such as Bell Helicopter, Cessna Aircraft, Jacobsen, Kautex, Lycoming, E-Z-GO, Greenlee, and Textron Systems.

<http://www.bellhelicopter.com>

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Boeing in India

The close relationship between Boeing and India goes back over 60 years when India entered the jet age on the wings of Boeing commercial jetliners. Boeing jets continue to be the mainstay of the country's domestic and intercontinental commercial fleets. New opportunities for partnership have also emerged in the area of defense. In January 2009, the Government of India selected the P-8I to fulfill its long-range maritime reconnaissance and anti-submarine requirements. In March 2009, Boeing opened the Boeing Research and Technology center in Bangalore to advance aerospace innovation. Boeing is also focused on long-term strategic partnerships and on creating sustainable value in the Indian aerospace sector. Boeing has developed important relationships with suppliers in India and is actively pursuing technical and business partnerships with Indian companies and institutions. Boeing is also uniquely positioned for growth in the burgeoning aircraft services and support market.

Boeing established a wholly owned Indian subsidiary - Boeing International Corporation India Private Limited (BICIPL) in 2003 to support the growing demands of India's aerospace industry. Boeing also has Field Service offices in Mumbai and New Delhi and a representative office in Bangalore. In 2008, Boeing subsidiary Aviall established its presence in India and has opened India's first aircraft parts distribution center in Noida near New Delhi. Another Boeing subsidiary Jeppesen, a provider of flight navigation solutions, has also announced plans to establish its presence in Hyderabad.

Boeing Commercial Airplanes

Air India has been a Boeing Commercial Airplanes (BCA) customer since 1960, when it acquired its first 707 jetliner. Since then, Boeing aircrafts are flown by Air India, Jet Airways and Spice Jet. Indian carriers continue to enlarge their fleet with Boeing airplanes like the 747, 777, 737 and the 787 series. Additionally, the Indian Ministry of Defense operates four 737-200s and three new 737 Boeing Business Jets.

In 2006, Boeing and Air India signed an order agreement for 68 Boeing commercial jets, the single largest commercial airplane order in India's civil aviation history, with a value of more than \$11 billion at list prices.

Boeing's 2010, Current Market Outlook for India forecasts that the Indian aviation market will require 1150 commercial jets valued at approximately \$130 billion over the next 20 years -- a market representing more than four percent of Boeing Commercial Airplanes' worldwide forecast.

Boeing Defense, Space and Security

On January 1, 2009, the Government of India signed a contract with Boeing Defense, Space and Security (BDS) to purchase eight P-8I long-range maritime reconnaissance and anti-submarine aircraft. The P-8I is an India-unique variant of the U.S. Navy's P-8A Poseidon. The deal is the largest defense contract to have been signed by the Indian government with a US company.

BDS has a rich portfolio of products and services to offer India, such as the combat-proven F/A-18IN Super Hornet multi-role strike fighter, the Harpoon missile and the CH-47F and MH-47G heavy-lift Chinook helicopters and AH-64-D Apache attack helicopters. The BDS portfolio extends to the C-17 Globemaster III strategic-lift cargo plane, C4ISR platforms, and Airborne Early Warning and Control systems. BDS is also a leading provider of aerospace support systems and Network-Centric Operations systems.

Industry Partnerships

Boeing is continually exploring new business and investment opportunities, as well as potential research and development partnerships in India. Boeing believes that 'Productivity' can be a strategic discriminator to ensure global leadership in the aerospace industry, as it attracts investors, provides value to customers and creates opportunities for growth. Boeing values the productivity opportunities that Indian partners can bring while leveraging the uniquely comprehensive capabilities of the whole Boeing enterprise.

Since 1997, Boeing has worked with India's premier software development companies, including HCL, Infosys, Wipro and Tata Consultancy Services (TCS) on numerous information technology projects including systems reengineering and development, web enabling, e-business applications and long-term application maintenance. In 2005, Boeing began using engineers from Infosys and TCS on a variety of knowledge-based engineering and data analysis projects. It has also contracted for engineering services with TCS and Infosys to support aircraft design activity.

Boeing's relationship with Hindustan Aeronautics Ltd (HAL) began in 1991 with HAL becoming the single source producer of 757 Over Wing Exit Doors. HAL is currently contracted to manufacture the 777 Gear Uplock Box, 777 flaperons and the F/A-18 Gun Bay Door with more projects to follow in 2010 as part of the \$1 billion MOU signed between Boeing and HAL in 2007.

Boeing has also contracted with Tata to manufacture 787 Floor Beams at a new facility in Nagpur. Companies like BEL will play a large roll in Boeing's industrial strategy in 2009 and beyond. Boeing is also looking at ways to partner with numerous Small and Medium Enterprises throughout India.

In addition to direct work placement, Boeing collaborates with Indian industrial partners on Lean manufacturing techniques and Boeing's Program Management Best Practices as part of its drive to bring the best of Boeing to India and the best of India to Boeing.

Research & Technology and University Partnerships

Boeing values India's leadership in research and technology and is investing in R&D and university partnerships to leverage and enhance India's and global aerospace capability and skill base.

In 2005, Boeing entered a research partnership with the Indian Institute of Science (IISc), Bengaluru. The Boeing-IISc partnership focuses on research in nanotechnologies, structural alloys, composites, smart materials and structures, process modeling and simulation, manufacturing technologies, prototyping through substructure fabrication and testing. The strategic alliance with the IISc—the first of its kind at Boeing in the area of materials science—will spur aerospace innovation and contribute to the advancement of Boeing's aircraft design capabilities.

Boeing has also reached out to four other Indian universities to explore opportunities in research and development. These universities are the Indian Institute of Technology (Chennai), Indian Institute of Technology (Kanpur), Indian Institute of Technology (Kharagpur) and Indian Institute of Technology (Mumbai).

On March 31, 2009, Boeing opened its Boeing Research & Technology-India centre, which marks a major milestone for Boeing's aerospace research and technology activities in India. The centre will be the focal point for all Boeing technology activities in India, collaborating with Indian R&D organizations, including government agencies and private sector R&D providers, universities, and other companies. It will work with strategic research and technology partners to develop high-end technology, particularly in the areas of aero structures and avionics. This is Boeing's third advanced research centre outside of the U.S. Others are in Europe and Australia.

Boeing will continue to invest in India through prominent technology outreach programs. Combining Indian talent and technical excellence with Boeing's experience and leadership in the aerospace industry will help Boeing assimilate new ideas and innovative processes and help grow the capabilities of the Indian R&D community to meet the emerging needs in country.

Boeing Investment in Indian Aviation

Boeing is investing in India to support the development of air transportation infrastructure. It benefits Boeing both directly and indirectly to participate in developing a system to accommodate many new Boeing products and services.

Boeing Commercial Aviation Services (CAS) provides products and services to support customers by helping them to improve fleet utilization, reduce costs and ensure passenger well-being. Aviall and Jeppesen, two subsidiaries of CAS will directly support the growth of Indian aviation through world class supply chain management services and flight navigation solutions. CAS also plans to invest significantly in India for training facilities, most of which will go to pilot training.

Boeing will also build a maintenance, repair and overhaul (MRO) facility in Nagpur.

Boeing – A Responsible Business leader

As a responsible business leader Boeing is committed to improving the quality of life for the communities in which we operate. Boeing has contributed and will continue to support various health and human services in India.

Boeing is deeply committed to protecting the global eco-system. As a technology leader, the company continues to pioneer environmentally progressive products and services. Boeing is also working with its suppliers and customers around the world to address environmental concerns.

Swati Rangachari, Director India Communications
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Continental Airlines (continental.com) is the world's fifth-largest airline, with more than 2,700 daily departures. Continental serves 132 U.S. and 137 international destinations – more than any other airline in the world.

Continental is the leading U.S. carrier across the Atlantic in terms of the number of cities served operating up to 308 departures weekly from 30 airports in 16 countries to its U.S. gateway hubs at New York and Houston, with onward connections to more than 200 cities throughout North America, Latin America and the Caribbean.

From India, Continental operates a daily Boeing 777 non-stop service between Delhi and New York Liberty and a daily Boeing 777 non-stop service between Mumbai and New York Liberty.

Continental Airlines is a Star Alliance member, the largest and most comprehensive airline alliance in the world. Overall, the Star Alliance network offers more than 21,050 daily flights to 1,167 destinations in 181 countries. Continental customers benefit from an expanded network of destinations, simplified air travel, more choice of connections, access to more airport lounges and an even more valuable frequent flyer programme.

Continental offers its award-winning BusinessFirst cabin service on all flights to and from Europe, the Middle East and India. Extra-wide electronic sleeper seats feature a 55-inch/140-cm seat pitch, a 156-degree recline and adjustable winged headrests. (BusinessFirst seats on Continental's Boeing 777 fleet feature enhanced seat width and recline. A personal entertainment system offers a selection of the latest movies and a variety of audio channels. An award-winning wine and champagne selection is served to complement excellent cuisine. A specially selected and trained corps of more than 300 Concierges provides individualised pre-flight and post-flight services for BusinessFirst customers at 35 key international airports worldwide. BusinessFirst was named Best Executive/Business Class at the OAG Airline Industry Awards 2009, based on voting by frequent flyers around the world.

And that's not all. Continental has recently launched a new, flat bed seat for the BusinessFirst cabins, nearly 50% fleet has new flat bed seats. The new seat, reclining 180-degrees and providing 6 feet 6 inches/1.98 metres of sleeping space in the fully extended position i.e. 6 feet 4 inches, which is one of the widest business-class seats in the air, measuring up to 27 inches/68.5 cm when the adjustable armrest is positioned flush with the seat cushion on the 777. Electronic controls enable customers to easily move the seats to the custom position most comfortable for them. The seats provide more individual storage space for personal items. Laptop power, headset and USB plugs are conveniently tucked above the customer's shoulder. iPod connectivity allows each customer to view their personal videos and enjoy their music, all while their iPod is charging. Flat bed seats on all aircraft feature a 15.4-inch/39-cm video monitor for customers to enjoy on-demand movies, music and games and have a privacy shell that allows for seclusion from other travelers.



FedEx Express is the world's largest express transportation company, providing fast and reliable delivery to more than 220 countries and territories worldwide. FedEx Express uses a global air-and-ground network to speed delivery of time-sensitive shipments, by a definite time and date with a money-back guarantee.

FedEx Express set up operations in India in 1984 through a Global Service Participant (GSP) and has had direct presence in India since 1997. FedEx is the only express transportation company to provide three gateways into and out of India, located in Mumbai, Delhi and Bengaluru and 31 weekly flights connecting India to the world.

Milestones in India:

- 2002: FedEx Express appoints Prakash Air Freight Pvt. Ltd (PAFEX) as its Global Service Participant (GSP).
- 2005: FedEx Express launches increased east and westbound flights, offering unrivalled connectivity to Asia Pacific, Europe and the Americas.
- 2007: FedEx Express acquires its Indian service provider PAFEX.
- 2007: FedEx Express marks 10 years of direct operations in India by inaugurating India's most sophisticated gateway hub in New Delhi.
- 2009: FedEx Express introduces FedEx International Economy® Services.
- 2009: FedEx Express announces the launch of FedEx India next-business-day domestic express service for the Indian market.
- 2010: FedEx Express launches new flights from Bengaluru connecting South India to Europe, Middle East and the USA and expands its Indian domestic express service.
- 2010: FedEx Express enhances service portfolio in India with the launch of FedEx Import services.
- 2011: FedEx Express launches new flight establishing direct connections between India and Asia.
- 2011: FedEx Express acquires the logistics, distribution and express businesses of AFL Pvt. Ltd. and its affiliate, Unifreight India Pvt. Ltd.
- 2011: FedEx Express launches a new intercontinental flight route with the introduction of the Boeing 777F in India.

Mission in India:

FedEx has three core elements linked to its mission in India: To establish itself as a Carrier of Choice, an Employer of Choice and a Neighbor of Choice.

- The Carrier of Choice: FedEx Express is committed to improve access to world markets, move things faster and create smarter and better solutions for Indian customers facilitating their growth into the global business environment. Strategic investments coupled with the company's extensive presence of direct sales and operational coverage across India has helped FedEx to reach out to more and more customers across the country.
- The Employer of Choice: FedEx Express, since inception, has put its 'People First' - both because it is the right thing to do and because it makes good business sense. The People-Service-Profit (P-S-P) philosophy underpins all business decisions. The Company's progressive policies, innovative programs and benefits have created a stimulating work environment that has encouraged career development of every employee.

For seven successive years, FedEx has been the only express transportation company to rank among the top 25 best places to work in the globally recognised Great Places to Work Survey (GPTW) in India.

- The Neighbour of Choice: FedEx Express also extends the P-S-P philosophy to the communities it operates in. FedEx cares about them and is dedicated to effective corporate citizenship, leading the way in charitable giving, corporate governance and a commitment to the environment. FedEx is committed to making a positive contribution to the community through a combination of financial and in-kind support for educational, cultural, civic and humanitarian causes. In India, FedEx has had long standing partnerships with Safe Kids Foundation, CRY, ORBIS, Smile Train and United Way to offer assistance in making a difference.



Story of India's first Multinational Aerospace Operations

In 1998, Goodrich Corporation opened a 100% wholly-owned subsidiary in Bangalore, India. The facility was originally opened as a service center for emergency evacuation slides. In 2000, the company embarked on the strategy to transition its facility from a service center to a manufacturing operation. Manufacturing began with aviation life rafts and slowly expanded to evacuation slides for narrow body aircrafts.

To allow for continued expansion the operations moved to a built to suit facility in Whitefield in 2005. The city of Bangalore was selected because of its history in indigenous aerospace industry. The operations have since grown to a large manufacturing, engineering & supply chain activity. Recent expansion has resulted in a footprint of 3,50,000 sq. ft

Currently, manufacturing operation encompasses manufacture of complete range of Goodrich evacuation inflatable assemblies, aircraft interior & exterior lighting assemblies, aircraft motor assemblies & cargo sub-assemblies like Power drive units & latch relay units.

The engineering center currently employs in excess of 490 engineers, supporting engineering needs of various businesses across enterprise.

The sourcing activity supports various businesses of the organization in their efforts to develop Indian vendors for various commodities. The focus is on developing vendors for machine components, forging, composites & electronic assembly. The local team assists in selecting, qualifying and managing the India supply base in addition to supporting tier I suppliers in establishing operations in India

The Goodrich facility in Bangalore was the first US-based aerospace manufacturing operations in India, providing Goodrich with a distinct advantage to serve the region as well as leverage the technical & manufacturing skill set of the country. Having a manufacturing & design facility in India has helped Goodrich in meeting the challenges of costs, time to market, as well as resource availability.

The various businesses of Goodrich India today are able to leverage low-cost operations to support manufacturing, design & sourcing initiatives. The operations in India have been able to improve margins on products & deliver better results to the shareholder; in addition, Goodrich is well positioned to better serve the burgeoning Indian market.

Continuous Improvement (CI) is ingrained in & embraced throughout the Goodrich India facility. To ensure consistency across the enterprise, Goodrich India has provided support through training & best practices sharing with its employees.

Through the use of CI tools, Goodrich India has achieved significant productivity gains on product transferred, reduced labor hours required to manufacture the inflatable assembly of an evacuation system by 25% across all product lines. By continuously evaluating scrap & waste, raw material consumption has been reduced by 20% & indirect materials have reduced by 5%. CI is also deployed in the administrative area to improve efficiencies of back office operations

Developing multi-skilled operators is another important contributor to the success of GR India & its CI activities. Each operator is encouraged to acquire more skills by providing opportunities for Job rotation through the product cells.

Idea boards are in place in the product cells & administrative areas to capture employee suggestions for improvement. In addition, teams have been established to focus on key objectives of EH&S, quality, culture & sports.



Hampson an international aerospace and defense group, has established a new state-of-the-art, low cost manufacturing facility in Bangalore, India.

Hampson provides added-value solutions in tooling systems, manufacturing and supply chain. Our mission is to provide global competitive advantage to our key customers through the use of innovative thinking in engineering and the integration of technology-driven manufacturing and supply chain strategies to create value that stands apart.

We provide fully integrated manufacturing solutions for:

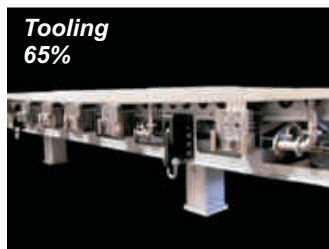
- Precision tooling systems for large, composite aerostructures
- Complete automated assembly tooling solutions
- Composite and metal aerostructures, components and assemblies

Hampson's horizontally-integrated range of unique processes and capabilities offers our global customers total manufacturing solutions from large tooling systems to aerostructure components, from a single point of service

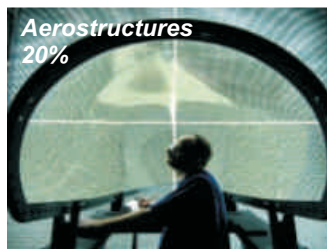
For customers who wish to fully leverage the efficiency savings available from the fully-integrated supply model, Hampson is able to offer a complete solution from traditional aerospace alloys to lightweight, advanced composite materials, plastics or transparencies and whether as kits of highly-engineered details components, integrated sub-assemblies or full structural assemblies.

Our integrated structure provides seamless, single interface for all projects, making Hampson a versatile, single source solution

Our Principal Markets:



Global leader in provision of large, tight-tolerance composite tools and tooling systems for defense, commercial aerospace and space/satellite industries



Leading supplier of high temperature composites, hybrid metallic-composite structures and transparencies



Global leader in the manufacture of laminated and solid shim components used in airframe assembly

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E-mail: Jagadeesh.Patil@hampsongroup.com

Website: www.hampsongroup.com



Yesterday, Today & Tomorrow—Harris is There

Global, Mission-Critical Communications for Growing Nations

Harris has engineered some of the world's most reliable, mission critical systems and is fully committed to the modernization of India's aviation communications infrastructure. From system design to installation and training, Harris provides comprehensive turnkey solutions from small, mobile towers and command shelters, to the world's largest Area Control Center's (ACC) and networked communications systems.

Harris enables dependable communications for air traffic control in some of the harshest environments on earth — from Antarctica, to the Amazonian rainforest, to the Middle Eastern deserts and beyond. Regardless of the environment or the operating requirements, our products ensure that critical information will be reliably exchanged in the air and on the ground for both civil and military applications.

At any given moment, thousands of planes are in the skies — over 100,000 aircraft each day. Harris enables air traffic controllers around the world, to manage air traffic safely and securely with state-of-the-art communications technology. A trusted partner to the global air traffic control community — Harris has successfully designed, developed, integrated, and operates some of the most advanced communications systems in the world.

One such success is the Federal Aviation Administration (FAA) Telecommunications Infrastructure (FTI), which provides the network backbone for air traffic control operations and administrative functions for the U.S. National Airspace System (NAS). Harris' network communication infrastructure systems and services provide the heartbeat for voice and data communications — around-the-clock and around the globe.

In FTI, Harris met the challenge to design, develop, deploy, and operate a telecommunications infrastructure that replaced and modernized the legacy multilayer combination of government-owned, leased, operated, and separately managed and maintained systems with a single communications solution and service for the FAA. FTI is not simply a replacement initiative. Approximately 20 percent of the program includes additional requirements such as networking in new control towers and communications services. Now more than 50,000 users, 20,000 services, 4,000 facilities, and a nationwide network later — FTI is online, bringing a scalable communications network to the FAA that will save more than \$600 million over the 15-year life of the program.

Harris is setting the standard for government performance-based service programs. The FTI enterprise network not only serves to provide secure and efficient transmission of voice, data, and video communications critical to the NAS today, but also establishes the platform for the net-centric NextGen programs of tomorrow. By leveraging the FTI network investment, the FAA is able to accelerate NextGen, minimize service duplication, reduce life-cycle cost, and ultimately achieve the vision of a seamless information infrastructure—a goal collectively strived for by the global ATC community.

Our vast domain knowledge of global ATC communications, technologies, and proven integration capabilities position us as a leader in the ATC market. We strive to become a trusted partner to India's Civil Aviation delegation. Harris is prepared to transform India's existing ATC communications infrastructure into India's NexGen of tomorrow.

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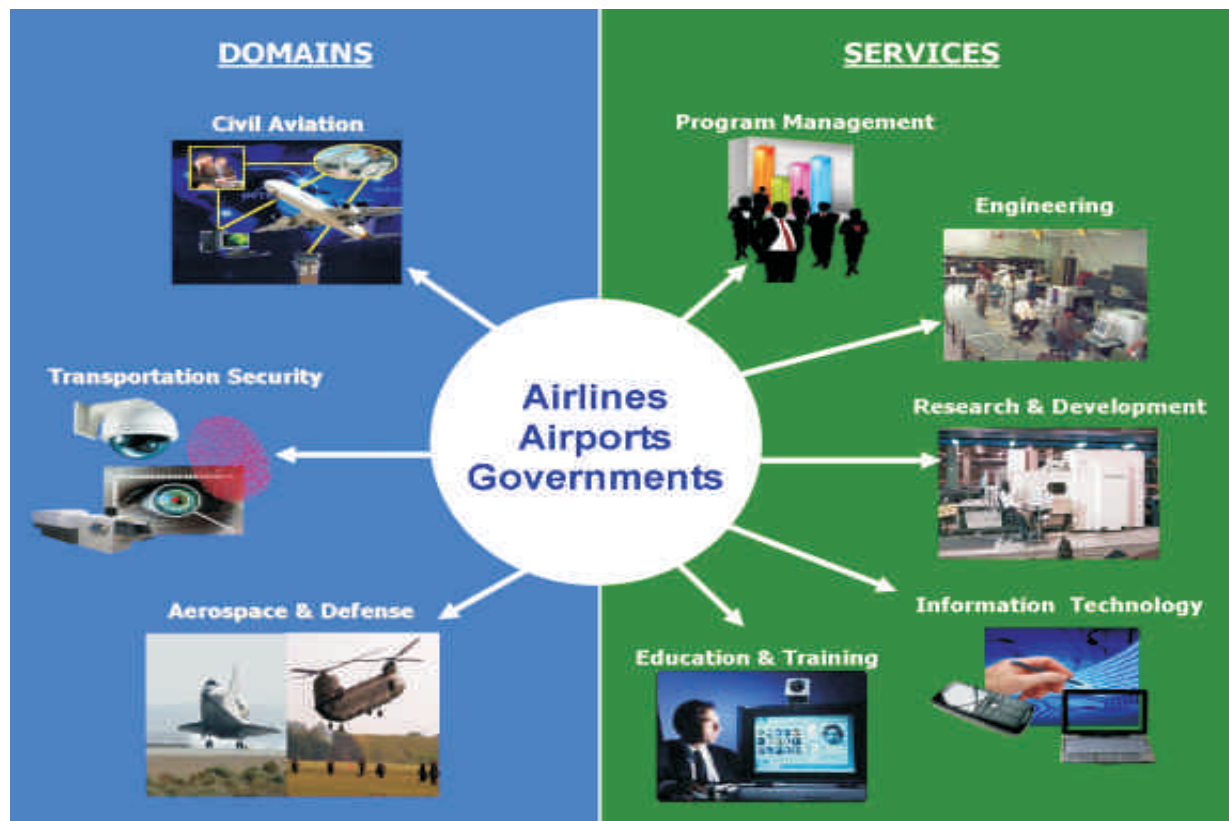


Integrity • Experience • Reliability

Hi-Tec Systems, Inc.

Hi-Tec Systems, Inc., founded by Mr. Tribhuvan Singh, an Indian American, is a thriving business providing high technology Engineering, Research, Management, IT, and Training support to the U.S. Government in the fields of Civil Aviation, Homeland Security, Aerospace and Defense. Hi-Tec has its headquarters in New Jersey and regional office in Washington DC. Since inception in 1995, Hi-Tec has supported numerous contracts or delivery orders, 20 of which are presently active and valued at approximately \$110 million. As a result of its commitment to excellence and outstanding contributions to civil aviation industry, Hi-Tec has been recognized with numerous state and national level awards including national recognition by the former U.S. Secretary of Transportation, Norman Mineta. This year, Hi-Tec is proudly celebrating its 15th anniversary as a successful Federal contractor.

Hi-Tec is currently leading four U.S-India Aviation Cooperative Program (ACP) projects to provide support to DGCA and AAI in technical, operational and management training, aviation safety, and in the development of airport geographic information systems. Working collaboratively with the U.S-India ACP, Mr. Singh, Hi-Tec's President & CEO, is poised to bring the company's 15 years of experience and subject matter expertise to the Airlines, Airports, and Government of India through its newly registered company, Hi-Tec Aviation Safety and Security Pvt. Ltd.



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PROFILES



Company Profile: IBM India & South Asia

Mission

IBM is the innovation partner for the Aviation and Aerospace Industry with a differentiating portfolio of business services, software and systems for innovation, growth and efficiency. At IBM Global Business Services, we collaborate with our clients, bringing together business insights, advanced research and technology to give them a distinct advantage in today's rapidly-changing environment. With our integrated approach to business design and execution, we help turn strategies into action. IBM operates in more than 170 countries, with over 400,000 employees worldwide.

Smarter Solutions for the Aviation and Aerospace Industry

IBM offers a comprehensive range of differentiating solutions to address the major industry themes and support clients in the Airports, Airlines and Aerospace industry to design, deploy and manage their on demand infrastructure while positioning their enterprises for the future. Examples of solution areas for airports, airlines and aerospace industry in India are:

- Airports and Airlines Commercial Growth
- Smarter Airport Operations & Stakeholder Collaboration
- Aviation Customer Insights & Passenger end-to-end Air Travel Experience
- Intelligent Multi-modal Transportation & Collaboration
- Supply Chain Excellence
- Aviation Maintenance, Repair and Overhaul (MRO)
- Managed Business Process Services
- Hosted Aviation Solutions
- IT Infrastructure Optimization

Our clients in the Aviation and Aerospace Industry include public and private Airports, full service and low-cost Airlines, Express and Logistics Services Providers, Rail and Metro Operators and leading manufacturers of Aerospace equipment.

More Information

Additional information about IBM Aviation and Aerospace Solutions and Industry Point of Views: www.ibm.com/travel

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ITT Defence International - Company Description

ITT Defence International is a top-10 U.S. defence contractor and a leading supplier of sophisticated solutions for defence and security. With our broad portfolio of technologically advanced solutions and strong local presence, we are ideally positioned to help India defend its soldiers, citizens and borders. ITT is one of the world's leading defence contractors and a leading provider of night vision equipment, battlefield communications systems, air traffic management solutions, space-based sensors, and radar and sonar technologies to protect ships, planes and coastlines. We are committed to supporting the military and defence requirements needed by our Indian customers to protect this important region of the world.

As India continues to modernize its most vital military, security and homeland affairs capabilities, our sophisticated and robust defence technologies will greatly accelerate the country's forward progress. India is a nation on the rise, and we are dedicated to taking its defence infrastructure and air traffic management systems further into the 21st century. Our commitment to India is unwavering. We have an established presence in Delhi and are partnering with local companies to develop solutions aligned with India's current and future needs. During the past seven decades, we have earned a reputation for breakthrough defence technologies and services.

ITT is the lead system integrator for the development and deployment of the Automatic Dependent Surveillance - Broadcast (ADS-B) system in the United States, a key component to improving the U.S. air transportation system. ADS-B will reduce the dependence on ground-based secondary surveillance radar systems by collecting GPS-derived position reports from aircraft and transmitting the data to ground stations. From there, the information will ultimately be relayed to air traffic control facilities to use for air traffic management. Our solution is flexible and scalable anywhere in the world.

Today, we're proud that the India Ministry of Defence — which commands the second-largest military in the world — depends on ITT as a primary provider of mission-critical technologies. Our core values of respect, responsibility and integrity guide the way we do business everywhere in the world, and make ITT a trusted partner to our customers in India. ITT has a long history of providing breakthrough solutions to the world's largest and most demanding defence customer: the United States. Now we are bringing that same level of support to the world's second-largest armed forces operation and foresee a long history of providing India with the best technologies for its people and its long-term prosperity.



The MITRE Corporation (MITRE) operates five Federally Funded Research and Development Centers (FFRDC) for the U.S. Federal Aviation Administration (FAA), the U.S. Department of Defense, the Department of Homeland Security, the Internal Revenue Service, Department of Veteran Affairs and the U.S. Federal Judiciary. Other MITRE U.S government sponsors include NASA and the U.S. Trade and Development Agency. Backed by a workforce of 7500 professionals, MITRE's work is routinely presented at major conferences, professional publications and is represented through numerous patents.

As part of the MITRE mission to serve in the public interests, MITRE has assisted over 45 nations including Argentina, Belgium, China, Egypt, France, Italy, Japan, Korea, Mexico, The Netherlands, Singapore, Spain, Taiwan, and Thailand, as well as international aviation organizations (ICAO, CANSO, IATA).

MITRE's Center for Advanced Aviation System Development (CAASD) is dedicated to improving the capacity, safety, security and efficiency of aviation worldwide. MITRE has worked closely with the FAA and international customers for over 50 years.

MITRE's aviation work focuses on advancing global harmonization, solving challenging operational problems, assisting aviation infrastructure development, and prototyping new technology. The work effort includes, among other things, aviation safety and security; Performance Based Navigation (PBN) implementation; the development of advanced decision support tools, and global infrastructure for communications, navigation, and surveillance, and aviation weather. Additionally, MITRE works on measures to increase airport and airspace capacity, while minimizing environmental impacts, and conducts collaborative research with the aviation industry. MITRE's expansive laboratory capabilities combine the newest technology with sophisticated modeling and simulation to help solve customer challenges.

MITRE's work within India for the Indian Space Research Organization (ISRO) and Airport Authority of India (AAI) includes: providing system engineering support during the development and implementation of Satellite-based CNS/ATM systems within India that are fully compliant with International Civil Aviation Organization (ICAO) concepts; assisting with the implementation of Geostationary-Augmented Navigation (GAGAN) system; supporting the U.S. – India Aviation Summit and Technical Symposium; and developing airport and airspace capacity enhancements and RNAV/RNP Procedures at airports in Delhi and Mumbai.



The Washington Consulting Group, Inc. (WCG) has established itself as a leader in the international aviation community in the areas of air traffic management, operations and training. Our senior consultants have in excess of 100 years experience in senior executive and managerial positions within the FAA including policy formulation and execution; management and technical training; and technology applications. We provide consulting services, operational support and training for virtually every element that is critical to the operation of an air traffic system for both domestic and international clients. Our business model assures these services are developed and provided within the unique requirements of each client and designed to blend transparently within their organizations. Our commitment is to continue to enhance that leadership position within the domestic and international aviation communities with a focus on pacing the rate of developing technology and growing economic demands on the aviation industry at large.

WCG has two principal corporate objectives that we consider to be corporate imperatives:

- The continuous improvement in our product and services
- A commitment to our clients' success; their goals and assuring their role in a safe and efficient world-wide air traffic system

WCG has been a critical asset in providing management, certification and proficiency training for air traffic systems throughout the world. We take great pride in our service record with the domestic and international aviation industry and our part in its safe operation and success. We chose to become members of the India-U.S. Aviation Cooperation Program during its early stages of development because we not only realize the opportunities represented by such a program but are greatly impressed by the expanding role India is playing in the growth of international aviation. We look forward to continuing our record of success by becoming partners in India's aviation program and leveraging our assets to assure their success. This will be accomplished by accepting the challenge of the future for international aviation and bringing innovation and creativity to the management, operation and training processes that enhances India's growing role in the international aviation community.



Founded in 1995, Metron Aviation pioneered the advancement of Air Traffic Flow Management (ATFM), working with the Federal Aviation Administration (FAA) to develop the industry's first Collaborative Decision Making (CDM) platform for optimizing system-wide traffic flow. Metron Aviation provides concept engineering, advanced research, software development, traffic flow management, surface operations management, airspace design and environmental research and analysis solutions to the global aviation industry. Metron Aviation fuses advanced science and mathematics with unparalleled subject-matter expertise to turn groundbreaking Air Traffic Management (ATM) research concepts into next-generation operational capabilities.

Recently, Metron Aviation was the recipient of the largest small business award in FAA History, System Engineering 2020 (SE-2020). Additionally, South Africa's Air Traffic and Navigation Services (ATNS) began live operations with Metron Aviation's ATFM solution this year, while Airservices Australia is in the process of deploying the ATFM solution to support its long-term gate-to-gate CDM vision.

The efficiency and optimization benefits of ATFM are measurable, verifiable and undeniable. For more than 10 years, the FAA command center has relied upon Metron Aviation to support its core systems and deliver innovations including the industry's first real-time advanced ATFM platform, CDM-based slot substitution and Airspace Flow Programs (AFP). The FAA's ATFM system has saved over 68 million minutes of delays, 186 million liters of fuel, 573 thousand metric tons of CO₂ emissions and U.S. \$6.3 billion in operating costs, since system-wide deployment in 1999.

SE-2020 is the FAA's strategic program for implementing the Next-Generation Air Transportation System (NextGen). The ten-year contract awarded to Metron Aviation has a value of U.S. \$1.15 billion, making it the largest single award to a small business in FAA history. Metron Aviation, as prime contractor, has assembled a proven team of industry leaders with unmatched domain expertise in all aspects of the National Airspace System (NAS) to provide the full breadth and depth of aviation expertise across all SE-2020 functional areas.

The ATNS Central Airspace Management Unit (CAMU) looked for proven ATFM solutions that could dynamically balance capacity and demand, while providing a CDM capability to allow airlines to effectively utilize available capacity for the maximum benefit of their business, operations and passengers.

The Metron Traffic Flow system provides the CAMU with comprehensive ATFM capabilities to model and implement all traffic flow initiatives for both aerodrome/airport and airspace volumes in South Africa. Traffic flow initiatives are used to dynamically balance air traffic demand with capacity to keep traffic flowing as smoothly and efficiently as possible. The system interfaces with ATM production systems, including

Thales' airspace monitoring tool, EUROCAT, and other software systems, through a scalable, event-driven data gateway.

Airservices Australia will initially deploy Metron Traffic Flow to provide the foundation for ATFM and regional coordination to enhance the capacity, efficiency and safety of the Australian airspace. The contract covers a 15-year period, with all options exercised, and provides the framework for future collaboration. Metron Traffic Flow will be used to manage traffic flow and capacity for all controlled airspace, including those flights originating from outside of Airservices Australia's area of responsibility and entering Australian airspace.

The system provides CDM capabilities for Airservices Australia's operations groups, airlines and regional stakeholders. Metron Traffic Flow will be deployed at the National Operations Center (NOC) in Canberra, control towers, area control centers and airline operations centers as well as being used by Australian military units.

Metron Harmony, Metron Aviation's complete Integrated-ATFM (I-ATFM) solution, provides proven products for strategic planning, pre-tactical and tactical management of traffic flows to maximize the available capacity of system-wide operations. The full-spectrum I-ATFM solution includes:

- * Strategic, pre-tactical and tactical traffic flow management through slot allocations and Calculated Takeoff Times (CTOT)
- * Pre-tactical and tactical departure management for merging into an en route stream or to a common departure fix
- * Pre-tactical and tactical aircraft sequencing, scheduling and runway allocations to meet airport arrival operating constraints
- * Pre-tactical and tactical airport surface management for optimizing operations
- * Fuel, emissions and noise impact modeling, monitoring and reporting

The latest Metron Harmony solution is Metron Harmony for Airlines. Metron Harmony for Airlines is the industry's First Air Traffic Flow Management Solution for Airlines. Metron Harmony for Airlines integrates a real-time and predictive view of air traffic conditions with airport surface operations to dramatically improve on-time performance, reduce tarmac delays, lower operating costs and provide better service to passengers. In the past, airline operations lacked visibility into airport, regional and nationwide traffic demand and were thus unable to optimize departure and arrival operations affected by these conditions. With Metron Harmony for Airlines, users get a comprehensive view of current and future air traffic conditions. For the first time, airlines can predict future congestion events, such as gate conflicts, to optimize pushback times, reduce surface gridlock and improve operations.

OSHKOSH CORPORATION

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Oshkosh Introduction



Oshkosh Corporation, a U.S. Fortune 500 company, is the world's largest manufacturer of fire and emergency vehicles and Aerial work platforms.

As the global leader in the Aviation Equipment Industry, many of the world's best airports are built using Oshkosh Aerial Work Platforms and when these airports become operational, they are protected by Oshkosh Aircraft Rescue and Fire Fighting (ARFF) Vehicles.

Major Airports in Asia such as Beijing Capital Airport, Korea Incheon Airport, Indonesia Soekarno-harta Airport and India's busiest airport Chhatrapati Shivaji Int'l Airport in Mumbai are protected by Oshkosh ARFF vehicles.

Oshkosh and its subsidiary JLG are recognized as the most reliable and most trusted brand names in the Aviation Industry; for Aviation fire protection, working at extreme heights or maintaining the airport building infrastructure and aircraft maintenance and repair operations.

Oshkosh Corporation has been working with the India market for the past twenty years and is proud to be associated with India and the emergence of India as a global economic power house. We are committed to India and its development and have established our India headquarters at Rectangle 1, Commercial complex D, Saket, New Delhi, India.

Our local team of sales and service specialists stand ready to serve India and its booming Aviation Industry. We look forward to contributing to India's Aviation success through safe airports, safe and highly productive methods of building airport infrastructure and safe aircrafts via proper use of tools in Aviation MRO.

Oshkosh is proud to be a member of US-India ACP and will continue to participate and actively contribute by bringing the latest industry best practices and professional networks into India.

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Moog Inc. is a worldwide designer, manufacturer, and integrator of precision motion control products and systems. Moog's high-performance systems control military and commercial aircraft, satellites and space vehicles, launch vehicles, missiles, industrial machinery, wind energy, marine applications, and medical equipment.

World Leader in Flight Control Systems and Critical Control Products

For over 50 years, Moog has developed a reputation throughout the world as a company whose people and products are at the forefront of the aerospace industry. We are known for our successful solutions to motion control challenges that are viewed by others as impossible. This directly reflects the creativity, work ethic and remarkable attention to purpose of our people.

Over this period, Moog has expanded its capability base to become a leading supplier of integrated control actuation systems for civil and military aircraft. We are continuously extending the depth of our systems capability while simultaneously expanding our core component expertise to take on the challenges and responsibilities of a changing industry. As a result we are positioned on virtually every platform in the marketplace, supplying reliable actuation systems that are highly supportable and add significant value for our customers.

Unrivalled Mix of Systems and Component Expertise

Moog has been supplying High Reliability Designs and Cost Effective Solutions to the Large and Regional Transport markets for over five decades. As a result, our products are on nearly every commercial platform in operation today. Moog offers a broad range of solutions from complete Fly-by-Wire flight control systems through control actuation subsystems to specialty controllers and utility actuators.

Our system solutions leverage a comprehensive design, integration and certification capability. With an unrivalled mix of system and component expertise, we are uniquely qualified to create solutions optimized around the customer's goal for cost, weight, reliability and performance.

Our product based solutions draw upon our extensive actuation and control heritage. With the broadest range of actuation and control technology available in the market we are able to address the most challenging applications with proven time tested building blocks.

Our Offering

- Stick-to-Tail Systems
- Control Electronics
- Primary and Secondary Flight Controls
- Actuators and Components
- High-Lift

Our Heritage:

- Boeing 787, 777, 767, 757, 747, 737
- Airbus A350 XWB, A380, A340, A330, A320

System Provider for the Boeing 787 Dreamliner and Airbus A350 XWB

Moog is providing the design, integration and certification support for the Primary Flight Control Actuation System on the Boeing 787 and Airbus A350XWB. The Moog system controls all of the primary flight control surfaces on the airplane. The system controls 21 flight surfaces and includes a mix of electrohydraulic (EH), electromechanical (EM) and advanced electrohydrostatic (EHA) servoactuators and all associated control electronics. Separately, Moog is also providing leading edge slat actuation components to the Dreamliner and the Trailing Edge actuation system for the A350 XWB including the Power Control Unit, inboard and outboard Geared Rotary Actuators, Gearboxes, Wing Tip Brakes and other miscellaneous components as part of the High Lift systems team.

Moog's products will feature:

- More electric actuation technology
- On board electronics for actuator power and control
- Highly integrated assemblies to meet challenging envelope constraints



Raytheon Company is a technology and innovation leader specializing in Defence, Homeland Security and other government markets throughout the world. With 2010 sales of \$25B USD, the company employs more than 72,000 people worldwide. With a history of innovation spanning 89 years, Raytheon provides state-of-the-art electronics, mission systems integration and other capabilities in the areas of sensing; effects; and command, control, communications and intelligence systems, as well as a broad range of mission support services.

With over 60 years of experience as a technology leader in the air traffic management (ATM) domain, Raytheon is leading the way in CNS/ATM innovation towards enhancing safety, capacity and efficiency to accommodate the projected growth of air traffic in our World's skies. Our AutoTrac family of open architecture, fully integrated surveillance data and flight data processing systems combined with our advanced, all solid-state surveillance systems technology offer low risk and low life cycle cost solutions to meet our customer's needs. Raytheon is leading the transition from ground based navigational aids to wide area satellite-based navigation and landing solutions for civil and military applications. Raytheon's Airport Security pedigree includes a major contract with the Port Authority of New York and New Jersey to provide a fully integrated Perimeter Intrusion Detection System capability for New York's LaGuardia and JFK International Airports, and New Jersey's Newark Liberty and Teterboro International airports.

Strategy

- Focus on key strategic pursuits, Technology and Mission Assurance to protect and grow our position in our four core defence markets:
 - Sensing: Expand beyond traditional RF/EO to new growth focus areas;
 - Effects: Expand beyond kinetic energy-based weapons;
 - C3I: Grow market presence through our world-class solutions, technology and products; expand knowledge management;
 - Mission Support: Expand beyond product support, engineering services and training.
- Leverage our domain knowledge in these core defence markets, as well as in Homeland Security and Cyber security.
- Expand international business by broadening focus and expanding in growth markets.
- Continue to be a Customer Focused company based on performance, relationships and solutions.

Raytheon in India

Raytheon has been in India for more than 60 years supporting Civil Aviation through aircraft business Beechcraft (now divested) and Hawker representative, Indamar. Raytheon has helped in modernization of India's air traffic control system through updated radars and automation to Delhi and Mumbai airports. Adding Chennai airport in 2010. Raytheon was contracted to update India's civilian air navigation system by supplying, installing and integrating a GPS and GEO augmented navigation (GAGAN) system. The Airports Authority of India plans to install the system in more than 100 airports in country. Indian Space Research Organization jointly developed the GAGAN system that was successfully tested in July 2006. This is the first phase of the ISRO-AAI sponsored project to implement a space-based navigation system in Indian airspace. Successful Radar integration with ISRO on the Chandrayan lunar mission. Raytheon's vision is to be the most admired defence and aerospace systems company in India through our world class partners, people and technology.

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Pratt & Whitney: An Overview



Pratt & Whitney, a United Technologies Corp. company (NYSE: UTX), is a world leader in the design, manufacture and service of aircraft engines, industrial gas turbines and space propulsion systems. Pratt & Whitney reported an operating profit of \$1.84 billion in 2009 on revenues of \$12.58 billion. The company's 36,000 employees support more than 11,000 customers in 195 countries around the world.

Pratt & Whitney was founded in Hartford, Conn. in 1925 by Frederick Rentschler. Pratt & Whitney's first aircraft engine was the 410 horsepower, air-cooled Wasp, which delivered unprecedented performance and reliability for the time and transformed the aviation industry. Pratt & Whitney has been leading change ever since.

Pratt & Whitney builds engines for front line fighters, like the F-15 Eagle, F-16 Fighting Falcon, F-22 Raptor and F-35 Joint Strike Fighter, as well as the C-17 Globemaster III military transport.

Pratt & Whitney Canada has produced more than 60,000 engines which power corporate jets, regional aircraft and helicopters around the globe.

Pratt & Whitney's large commercial engines power more than 30 percent of the world's passenger aircraft fleet. The company continues to develop new engines and work with its partners in International Aero Engines and the Engine Alliance to meet airline customers' future needs.

Pratt & Whitney's broad portfolio of businesses includes industrial gas turbines that light cities and power ships. Our PureCycle® power system converts heat from geothermal resources, oil and gas wells and other sources into clean electricity.

Pratt & Whitney Rocketdyne has been the power behind over 1,600 launches and has been a key engine provider to the U. S. space program since its inception. That service continues today with the Space Shuttle Main Engines and the engines for the current Delta and Atlas launch vehicles. The U.S. return to the moon and innovative missile defense products will also be powered by Pratt & Whitney Rocketdyne engines.

Pratt & Whitney is developing game changing technologies for the future, such as the PurePower® PW1000G engine, with patented Geared Turbofan™ technology, for next generation of passenger aircraft and hypersonic propulsion systems for aircraft that will travel more than six times the speed of sound. Through Pratt & Whitney Global Service Partners, Pratt & Whitney is also developing innovative new services that will delight customers around the globe. Pratt & Whitney Global Material Solutions is the first OEM to re-engineer, certify and manufacture both gas-path and life-limited parts for the CFM56-3 engine.

For more information, visit Pratt & Whitney's Web site at www.pw.utc.com

CFM and CFM56 are trademarks of CFM International.

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MAJOR PRODUCTS

Commercial Engines

PW2000 for Boeing 757
PW4000 for Boeing 747, 767 and 777 and Airbus A300, 310 and A330
PW6000 for Airbus A318
GP7000 for Airbus A380
V2500 for Airbus A319, A320 and A321
PurePower PW1000G engine for Mitsubishi Regional Jet
Bombardier CSeries Aircraft and Irkut MC-21 Aircraft

Military Engines

F100 for F-15 Eagle and F-16 Fighting Falcon
F117 for C-17 Globemaster III
F119 for F-22 Raptor
F135 for F-35 Joint Strike Fighter

Small and Medium Engines

Pratt & Whitney Canada builds 10 families of engines used in a variety of applications, including the PW307A for the Dassault Falcon 7X and the PW600 family for a new generation of Very Light Jets.

Space Propulsion

Pratt & Whitney Rocketdyne powers the Space Shuttle, supplies booster engines for Delta II rockets and supplies boosters and upper stage engines for Atlas V and Delta IV rockets.

Power Systems

Pratt & Whitney Power Systems (PWPS) is an industry leader in providing solutions to the power generation market through its industrial gas turbines and aftermarket services. Its gas turbines serve as mobile, easily assembled and highly efficient power generation systems. These systems can deliver as much as 60 MW of safe electric power. PWPS has installed more than 2,000 industrial gas turbines in more than 50 countries worldwide.

PWPS is also growing its alternative and renewable energy portfolio. With its PureCycle® product and the purchase of Italy-based Turboden in July 2009, Power Systems is expanding globally into Organic Rankine Cycle (ORC) power generation using biomass, geothermal and industrial waste heat.

COMPANY PROFILE

Financials

Revenues: \$12.58 billion (2009)
Operating Profit: \$1.84 billion (2009)

Current Employment

36,000 employees worldwide

Customers

More than 600 customers operate Pratt & Whitney large commercial engines in 140 countries.

Nearly 30 customers operate aircraft powered by Pratt & Whitney military engines.

More than 9,000 regional airlines and other operators fly with engines made by Pratt & Whitney Canada.

Overall, Pratt & Whitney serves more than 11,000 customers in 195 countries.



Pratt & Whitney
A United Technologies Company



Founded in 1932, and located in New York City in the United States, Vaughn College of Aeronautics and Technology offers graduate, undergraduate and certificate programs in the fields of aviation, engineering, technology and management. The institution is accredited by the Middle States Commission for Higher Education (MSCHE) in the US. Programs in engineering technology are accredited by the Technology Accreditation Commission (TAC) of Accreditation Board for Engineering Technology (ABET) and management degrees by the International Assembly for Collegiate Business Education (IACBE).

As part of its global initiative, Vaughn College of Aeronautics & Technology has been successfully offering three of its degree programs in India in collaboration with SREENIDHI Institute of Science and Technology (SNIST) Hyderabad since 2007. These programs are approved and recognized by All India Council on Technical Education (AICTE), India and MSCHE, US.

Vaughn College's vision is to be the international institution of choice by providing outstanding comprehensive training and higher education programs in the field of aviation and related fields, through collaboration with regulatory agencies, industries and academic institutions. Vaughn's international mission is to provide world-class training and education to current and future global aviation professionals, and assist them in achieving their fullest personal and career potential.

Today at SNIST in India, nearly 400 students are enrolled in Vaughn's programs pursuing Bachelor of Science programs in avionics, airline and airport management. The first cohort of students will be graduating in May of 2011. Based on this success, Vaughn has plans to expand our program offerings to other parts of the Indian subcontinent, as well as other parts of the world.

Vaughn College / SNIST programs offered to Indian students are:

- BS in Airline & Airport Management (Dual Major)
- BS in Airline Management
- BS in Electronics Engineering Technology (Avionics)

These degree programs are replicated and offered at SNIST in a manner that is consistent with Vaughn's accredited degree programs, including Vaughn's educational purposes and objectives, admission criteria, academic standards, curriculum, content of courses and programs, instructional methods, academic support services, outcomes assessment criteria and procedures, and instructional methods. Vaughn works with SNIST to identify the qualifications necessary for faculty who teach the Vaughn-developed courses.

SNIST provides the necessary infrastructure, library and qualified core faculty and staff for three fourths of the credits required for the award of BS degree by Vaughn College. Vaughn College's visiting faculty teach one fourth of the credits in specialized core courses in India. Students also have an option to take one fourth of the credits at Vaughn College's campus in New York.

Visit www.vaughn.edu for further information about Vaughn's international programs, or contact the director of distance learning and international programs, Mr. Ray Axmacher at ray.axmacher@vaughn.edu.

Vaughn College of Aeronautics and Technology

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Strategic Decisions Group

Business Strategy

Risk Management

Portfolio Optimization

Partnering

SDG, is a global strategy consulting firm renowned for applying leading-edge decision theory to uncover opportunities for creating shareholder value. Founded in 1981, SDG has roots in the engineering and business schools of Stanford University. We guide our clients to find innovative, creative strategies to thrive today, while also helping them build internal competencies to meet competitive challenges in the future.

We have worked with over a third of the Fortune 100 companies, assisting them on their most important and pressing issues. We continue to help large corporations manage uncertainties by applying our leading edge decision analysis framework to corporate decision-making, strategy development, and risk management. Our work spans across sectors and boasts of an impressive clientele.

We have supported our aerospace and transportation clients in managing complex issues like large capital investments, portfolio optimization, regulatory uncertainty and competitive pressures

In India, we have worked with some of the fastest-growing companies in aerospace and transportation and we have supported our clients in this sector across:

- Strategy for large capital investments
- Bidding
- Portfolio optimization
- Managing regulatory and competitive uncertainty

We continue to help companies in this sector find innovative strategies to face today's challenges, and prepare for the future.

We believe that our global pedigree, unique capabilities, a team of highly qualified and experienced consultants, and strong understanding of the Indian market environment ideally positions us to support the Aviation Cooperation Program in India.



A Brief Overview of SDG India

Presence in India for over 12 years with offices in Mumbai, Delhi, Bangalore and Chennai

Focus sectors: power, mining & minerals, oil & gas (upstream and refineries), airports, transportation, construction, private equity and life sciences.

Key clients: IDFC, GMR Group, Archeon Group, OPG Group, Murugappa Group, Rubamin, FLSmidth, Tata, L&T, Jubilant, Citibank, Infosys, GTI & Airworks, Sona Group and Coromandel

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ProMark Associates is a global provider of innovative, cost-effective air purification solutions designed to maximize the return on the customer's investment in filtering and conditioning air. Through advanced engineering, ProMark delivers a technology that captures and destroys contaminants in indoor air. Total Spectrum® Air Purification System shifts the paradigm from dependence on ventilation with outside air to high quality indoor air achieved with recirculation of purified air.

A value proposition that delivers an ROI and clean air by recirculation of conditioned air. Less demand on conditioning also reduces energy usage leading to an ROI in 2 years. The result is clean, green, indoor air for the 21st century.

ProMark's mission in India is to bring the benefits of sustainable air purification technology to large buildings, with a special focus on airports, healthcare and commercial buildings. Our first project in India is a specially designed Total Spectrum® Air Purification System for Terminal 3 of Indira Gandhi International Airport.

Additional initiatives under consideration include:

- Retrofitting Total Spectrum® APS to existing buildings with serious IAQ issues. Many buildings are surrounded with polluted air from vehicles, power plants, industrial manufacturing gases, and airborne pathogens such as viruses, bacteria and allergens. These challenges make using outside air undesirable above the very minimum.
- Integrating Total Spectrum® APS into new and existing buildings for energy conservation.
- Forming a distributor joint venture to explore manufacture in India and assure supply chain excellence; work with local suppliers to utilize Indian content where possible. Provide after-purchase support to customers in India through well-educated and trained Indian engineers.
- Provide training and education in indoor air quality best practices, especially the capabilities of air purification.

ProMark's range of services and products includes:

- Engineers help staff diagnose air quality problems and achieve the best possible IAQ with reduced energy and maintenance costs
- Assistance to help optimize existing HVAC and integrate air purification technology into sustainable, whole building design
- Technical support including design specifications, engineering, installation, commissioning, on-site training and service classes
- Laboratory services that include corrosion measurement, testing of filtration media remaining life, and environmental monitoring
- Full range of products for gas phase filtration including proprietary media, filter housings, and patented filter modules

ProMark, founded in 1988, has been providing clean, safe indoor air in some of the most challenging environments, such as refineries, mining, power plants, paper mills, and airports where odors, toxic gases, and corrosion can threaten people and sensitive electronics. Our work has provided control room protection and avoided catastrophic accidents. Commercial installations include healthcare facilities, casinos, museums, hotels, restaurants, and offices. International clients are found in North and South America, the Middle East, and now India. ProMark is guided by industry standards such as ASHRAE and quality/process oversight such as ISO. As a company we are committed to sustainable practices and products.

The capability of providing clean indoor air is significant and the health and financial benefits are immense and quantifiable. ProMark's growing partnership with India is an opportunity to transform the built environment of the 21st century.

TEXTRON

Textron is a \$10.5 billion (2010) global multi-industry company with market-leading brands serving the General Aviation, Aerospace & Defense, Industrial and Commercial Finance markets. Founded in 1923, Textron has grown into a network of businesses with revenues of \$10.5 billion and around 32,000 employees in 25 countries serving the global customer base. Textron is ranked 220th on the Fortune 500 list (2009) and continues to grow as an industry leader with strong brands such as Bell Helicopter, Cessna Aircraft, Textron Systems in the aviation & defense sector besides several leading industrial brands like Kautex, E-Z-Go, Greenlee & Jacobsen.



Bell (31% of 2010 revenues)

Bell Helicopter is a leader in the global helicopter industry and the pioneer of tiltrotor aircraft. Single engine Bell 407, light twin engine Bell 429 and medium twin engine Bell 412 are extremely versatile helicopters providing excellent support to Indian customer for all operations.



Cessna (24% of 2010 revenues)

Cessna Aircraft Company, having produced more than 200,000+ aircraft is the world leader in Business Jets (Citation series) & variety of single engine aircraft including highly popular Caravan & Cessna trainers. Citation CJ 2+ & XLS + are preferred options for Indian customers.



Defense and Intelligence (18% of 2010 revenues)

Textron Systems has been providing innovative solutions to the defense, homeland security and aerospace communities for over 50 years. Textron Systems is known for its precision smart weapons, intelligent battlefield systems, piston engines, armored vehicles, motor life boats and unmanned aircraft systems.



Industrial (23% of 2010 revenues)

The Industrial segment consists of leading industrial brands including Kautex (plastic fuel systems for automotive), E-Z-Go (electric golf-carts and utility vehicles), Greenlee (professional tools) & Jacobsen (turfcare equipment).



Finance (4% of 2010 revenues)

Textron Financial is a commercial finance company providing financial solutions for Textron customers in Aviation & Golf segments.

Textron India, a 100% subsidiary of Textron Inc. USA was established at Bangalore in December 2006, under the chairmanship of Mr. NR Mohanty- a renowned technocrat, former Chairman of Hindustan Aeronautics Limited and a recipient of Padmashree award. The objectives of the Textron India are as follows:

- To provide high-end engineering support to Textron operating units across the world through Textron Global Technology Center.
- To promote Textron brands as partners in India's growth offering best value proposition to the Indian consumers & industry and to meet multiple and concurrent business objectives of Textron BUs in India.
- To develop Indian sourcing partners for cost effective supply chain solutions to Textron BUs

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UPS or United Parcel Service is the world's largest package distribution company that provides express delivery and logistics services to more than 200 countries and territories across the globe.

UPS entered the Asia Pacific region 17 years ago and serves more than 40 countries and territories in the region. In November 2000, UPS and Jetair Limited – India's largest General Sales Agency, entered into a joint venture to form UPS Jetair Express Pvt. Ltd. in India.

In 2007, UPS Jetair Express announced a strategic alliance with AFL Pvt. Ltd. that has significantly expanded accessibility to UPS services in India while providing export capabilities to AFL. With 180 AFL WiZ Express Centres across India and UPS's global network that serves more than 200 countries and territories, the alliance benefits all business and consumer segments especially the SMEs.

UPS' network in India comprises the company's fleet of iconic brown vehicles that UPS is known for worldwide, centralized call centre, trained service providers and superior technology applications. What adds to UPS' credibility is that the company employs stringent training practices and ensures the best service standards, thereby aiming to create a benchmark in the industry. UPS operates its own fleet of aircrafts with eight weekly flights to and from Mumbai. It serves the five major airports including Mumbai, Chennai, New Delhi, Bangalore and Cochin.

UPS provides international express delivery services in India and offers a comprehensive range of cost-effective solutions including export and import of express documents and packages throughout more than 200 countries and territories worldwide. Some of its specialized products include those for express documents and medium sized shipment patterns, which will cater to the high value category. These essentially benefit manufacturing industries, essentially those involved in high value and time sensitive shipments.

Technology today has become one of the basic requirements to effectively delivering business needs of customers. UPS's sophisticated technology infrastructure ensures the smooth delivery of 15.5 million packages a day. Today technology also means the Internet, and UPS is using its technological expertise to offer e-commerce solutions to businesses worldwide.

Honeywell

Honeywell began its investment in India over 40 years ago, with a vision to strengthen both our presence in India and our strategic relationships with Indian industry. Today, Honeywell has grown from 1,000 people in 2002 to more than 10,000 in locations throughout India. We remain deeply dedicated to the success of India's aerospace sector.

Superior technology, products, solutions expertise and customer relationships make Honeywell one of the most valued aerospace names in India and across the globe. With our nose-to-tail and gate-to-gate integration capabilities, Honeywell consistently delivers innovation that meets the needs of our customers for higher performance, enhanced reliability and safety and reduced costs. Our complete product portfolio of aircraft systems helps ensure mission readiness and aircraft safety.

Our contributions to Indian engineering, manufacturing, research and technology development capabilities continue to expand as we support the growing demands of India's aviation, aerospace and defence industries. Honeywell's team of engineers is developing critical technologies for customers across the globe, while aircraft with Honeywell parts fly throughout the skies of India. From commercial airliners to business jets and general aviation planes, our products keep pilots – and passengers – safer and more comfortable. India's commercial aerospace industry is changing, and we're changing with it, developing avionics solutions that make flying safer and mechanical solutions that make operating aircraft more cost effective. Because our products combine strong performance with dependability and efficiency, they do more than perform in the air – they perform for their owners and operators as well, providing increased value for their aviation investment.

Our products reach beyond everyday travelers. While the people of India are sleeping at night, India's borders are secured by fighters containing our high-technology products; products that are made in India, by Indians. Today, Honeywell engine technology is ready to support the next generation of Indian Air Force aircraft, with the F125IN engine for the Jaguar fighter. It's only the latest chapter in the story of our collaboration with India.

We are committed to continuing to advance India's indigenous technology, from development through to production. Over 40 years ago, we began a partnership with Hindustan Aeronautics Limited (HAL) to manufacture and support high technology products in India. Then, we created history, enabling HAL to build our TPE 331 10/12 turboprop engine and to export it to the world market, making HAL a global aerospace engine exporter for the first time. Honeywell technologists across India develop innovative solutions for our aerospace customers worldwide, while our manufacturing facilities make products that are used in India, and around the world.

Honeywell's commitment to India and its aerospace industry is demonstrated in the most important of ways – by ensuring that our high performing products and services keep India's passengers, pilots and people safe and secure. From our first engagement with HAL to the innovative F125IN engine, we've been part of the history of Indian aerospace – even if you didn't know we were there.

For more information about Honeywell and Honeywell Aerospace's activities in India, please click: www.honeywellforjaguar.com.

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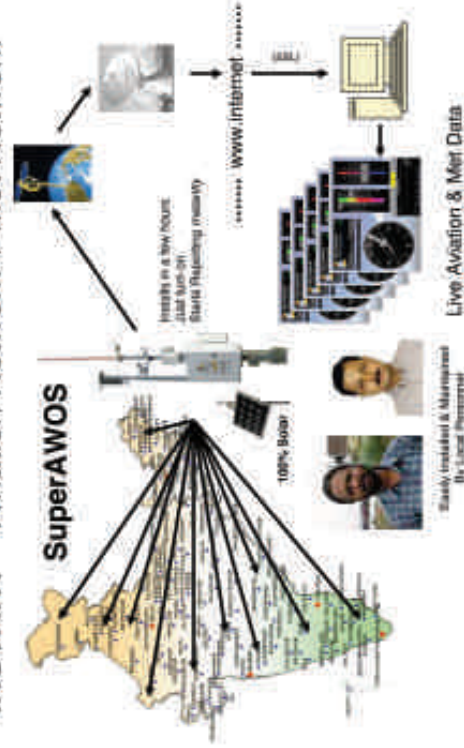
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Gnome-Bleriot of 1910

Ancient Indian mythological literature depicts the idea of using airship as transport. The idea existed in ancient India in which the airship's cockpit was directly interlinked with pilot brain in thought mode process. The airship was maneuvered by thought in wireless medium. It is quoted in the Ramayan a epic that "Indra", King of Gods had a Pushpak Ratha, which could fly. Ravana, King of Demons, forcibly took away the Pushpak Ratha from him. Ramachandra, after killing Ravana, returned to Ayodhya from Lanka in the same Pushpak Ratha. In the Mahabharata epic, there was a king named Vasu who had an airship which could fly at his will. He was, therefore, known as Uprichar. In the Puranas, it is described that the Hindu Gods used to fly in the sky, seated on the birds. Thus, the lord Brahma used a Swan, Lord Vishnu used Garuda, Kartika a Peacock, etc. In some of the mythological old script stories, the name "Udan Khatola" is also referred. Later, it was quoted as the term "Viman" used for air transportation in the Puranas.

Among the first Indians who had taken keen interest in aviation in the early days of powered flying machines was the then Maharaja of Patiala, who sent one of his senior engineers C. W. Bowels, to Europe, to study the new art of flying machine. Bowels returned to India in

December 1910, bringing with him English - built "FARMAN" biplane and two - seat "GNOME-BLERIOT" monoplane.

A successful flight was made on December 17, 1910 in Allahabad by M. Pequet over the Yamuna and the Ganges and round the Allahabad fort in a biplane. Flying in the Exhibition grounds was commenced on 20th December, 1910 and continued daily until 6th January, 1911. On February 18, 1911, flying across the Yamuna, Pequet became the world's first aerial mail carrier from Allahabad to Naini and back to Allahabad. The plane flew at 40 m.p.h. in air and 30 m.p.h. for landing, took 27 minutes from Allahabad to Naini, a distance of eight miles and back and flew at the altitude of 130 feet. This occasion coincided with an important Hindu religious festival held every 12 years, the "Purna Kumbha".

The first Egypt-India flight took off from Heliopolis airport in Cairo on November 29, 1918 and reached Calcutta on December 17, 1918 and landed in Race Course ground of Calcutta. This was the first international flight to India. The Cairo -Delhi flight, a distance of 3,233 miles, was covered in just 48 hours in air and the entire 4,090 - mile journey to Calcutta was covered in total elapsed time of 19 days. The first direct



UK-India flight commenced on Friday, December 1918 and ended on Wednesday, January 15, 1919, the aircraft never once landed back at its original destination.

Dr. P. Subbarayan, the then Minister for Transport and Communication, took keen interest in the celebration of Golden Jubilee of the world's first airmail event and personally attended the function at Allahabad. A Viscount turboprop aircraft of the Indian domestic air carriers, Indian Airlines, its latest acquisition at that time, was chartered to send a full planeload of invitees from Delhi. Among them was Mr. V. Shankar, Chairman of the Airlines and Secretary, Ministry of Transport and Communication, who was concurrently the Head of Civil Aviation Department. In addition to the invitees from New Delhi, the Director General of Postal Services in different states and senior officials of the ministry from all over India also attended the function.

Incidentally, the first non-stop flight from the UK to India, Cranewell to Karanchi, was made on April 24-26, 1929, the distance of 4,130 miles was covered in 50 Hrs 37 minutes by Fairey long-range monoplane, powered by a 530hp Napier lion XI engine.

The first flight from England to India made by an Indian crew R. N. Chawla and Aspy Engineer was a DH-Moth. They left England on April 25 and reached India on May 1, 1930. Chawla and Engineer also made the first flight from India to England, March 3-20, 1930.

J. R. D. Tata was the first Indian pilot to fly solo a DH-Moth plane from India to England, May 3-12, 1930; he was contesting the Aga Khan Race – India-England or vice versa. Aspy Engineer started from England to India.

In May 1926, the Indian Air Board submitted memorandum on the past history and future development of civil aviation in India. The Board observed that India was the country admirably suited for the development of aerial transport. Meteorological conditions were excellent for many months of the year and there was no reason to believe that the occasional difficulties like Monsoon, although serious, were insurmountable.

As a result of popular demand for the formation of an Indian arm on the lines of Royal Air Force (RAF), the Indian Sandhurst Committee was set up in 1925 under the chairmanship of Sir Andrew Sakeen, the then Chief



JRD Tata

Considered to be the father of Indian Civil Aviation

of the General Staff: Assembly members like Pandit Moti Lal Nehru and Moammad Ali Jinnah were in the Committee. The Committee strongly recommended that the Government of India (GOI) should take necessary steps to form an air arm of the Indian Army as soon as possible and due to the pending proper flying training facilities in India, the Indian pilots should be trained at the RAF College, Cranwell. The Committee's findings were published in April 1927 and the IAF Act was passed by the Indian Legislature on October 8, 1932, and IAF was born!

TaTa Sons Limited submitted its first plan for Karachi-Bombay air service to the Government of India in July 1929 and their proposal was rejected on some pretext.



The first proving flight of KLM - the Royal Dutch Airlines to Java passed through India on November 9, 1924. The KLM aircraft landed in Karachi. KLM's Fokker F-VII, H-NACC, passed through the Indian subcontinent during the period November 10-13, flying from Karachi to Dum Dum Airport via Ambala and Allahabad a distance of 2,790 km covered in about 21 hours at the average speed of about 133 kmph. For the first time in the Indian aviation history, a bird hit occurred on November 10, 1924 while landing at Ambala.

A regular inter continental flight between UK and India services inaugurated on March 1930, by Imperial Airways became the first airline to operate a schedule service in India. Five months later, on September 12, 1929, KLM inaugurated a fortnightly service on a trail basis with Fokker VII, PH AEZ with captain Ivan W. Smirnoff in-command. The aircraft covered the distance of 13,738 km between Amsterdam and Bandung which passed through Karachi, Nazirabad, Allahabad and Calcutta in India in 89 hours (total travel time of 12 days) at the average speed of 169 kmph and was then the longest air, route in the world. In the same

year, a first bilateral agreement was signed between India and other country (Dutch Government) for the regular flight of the KLM in this subcontinent.

On December 21, 1929, the UK-India flight was extended from Karachi to Jodhpur; Imperial Airways operated the extension under charter Agreement with GOI. The service was further extended to Delhi on December 30. The first service to Delhi was operated with G-EBMX. Long distance air travel to places like India, though involving several night stops in the beginning, halved the travel time taken by fastest surface transport, a combined train and boat service, available then.

The Imperial airship scheme was to build a fleet of six airships, to be operated by a commercial companion, a service to India and Australia, was submitted on April 7 1922. Incidentally, after the crash of the first airship R101, the samples of the natural gas collected during the preceding year from oilfields in India and Burma were still under test, for exploring the possibility of using fuel for airship, by the Indian Institute of Science (IISc), Bangalore, according to the first annual report of the Directorate of Civil Aviation (DCA) for 1932-33 [Perhaps one of the first recorded mention of IISc with aviation-related matter].

When Frederick Tymms landed at Bombay towards the



DH-Moth Air Plane of 1930



end of February 1931, British India was in the throes of development of a new federal constitution as a major step towards achieving the Dominion status. Tymms' political chief was Sir Bhupendra Nath Mitra, one of the three mandatory Indian Members of the Governor General's Council. The Finance Member was Sir George Schuster, whom Tymms had met in Kenya, when he was member of the Hilton Commission in East Africa. He was responsible for all the financial proposals of the GOI and had to carry the Legislative Assembly with him.

In the year 1910, the Government passed the Indian Airship Act which regulated in some detail the flying of aircraft over the Indian territory, but it was not until 1917 that the Government began to talk officially about the question of introducing air transport into the country. In the year 1927, the Air Board submitted an important Memorandum of GOI and perhaps for the first time one of its recommendations was acted upon its own dissolution in favor of creating Directorate of Civil Aviation. The Board, after contrasting India's neglect of commercial aviation up till then with the admirable suitability of its terrains and climate for the development of air transport, enunciated certain principles and made a number of specific proposals aimed towards rapid development of civil aviation within India and participation of India in external services. Among these principles were:

- All aerodrome and necessary equipments should be the property of the GOI, which should be responsible for the provision of wireless and meteorological services.
- The GOI should claim in future to be consulted at all stages on the terms of any contract for new services touching India, and to participate as a principal in the contract with a right to insist on such provisions as may be necessary to promote India's interest; and
- The GOI should accept the principle of subsidizing internal air services in the early years.

All these recommendations were approved by the Indian Legislature.

In 1930, George Woods Humphrey wrote a letter, typical of the man, to Whitehall asking if it was policy of

the HM Government to "Allow" Indians to develop an air transport industry independently. The letter was communicated to GOI and found its way on to the minister's desk, where it produced an explosive effect on Mitra's strong nationalistic feeling. It was not until 1943 that conditions were right for India to find it possible to adopt a more modern policy to replace this impractical concept of sectional operation. The GOI established the DCA in 1927 and it was created as an integral part of the Department of Industries and Labour, an unusual agreement adopted because the organization was embryonic and considered to be not ready to stand on its own feet as an "Attached" office like Public Works.

Lt. Col. Shelmerdine was appointed to the post of the Director and he was the member of the original Controllerate of Civil Aviation specializing in Aerodrome and Air Route Organization. The man, who took the initiative to establish the Delhi Flying Club and someone who was always a leading spirit until his untimely death in 1940, was Raymond Grant Govan, the reigning member of the house of Govan Brothers, managing agents for a diversity of industrial enterprises. A keen owner-pilot, he cultivated early concept of providing air transport services in Northern India as did J.R.D. Tata for Western and Southern India.

Tymms' arrival at Delhi from Bombay at the end of February 1931, was taken in hand of Jhon Shilliday, ICS, Secretary to the Government in the Department of Industries and Labour, who had temporarily taken direct charge of the subordinate office of the DCA after Shelmerdine left. Shilliday put him up at the Imperial Delhi Gymkhana Club which became his temporary Delhi office. At the Delhi Flying Club, the first student pilot to undergo flying instruction course had been Bhagat Bihari Lal, who later was sent to England for training as a flying instructor at the expense of GOI as one item of the scheme for training Indians in Aviation.

(to be continued in the next issue)

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