Shared Horizons

US - India Aviation Cooperation Program

A Biannual Publication of the US-India Aviation Cooperation Program

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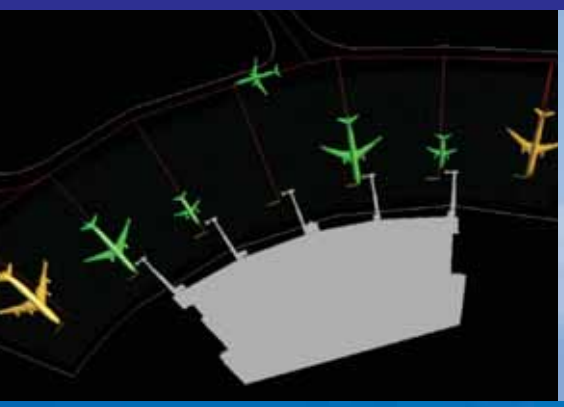
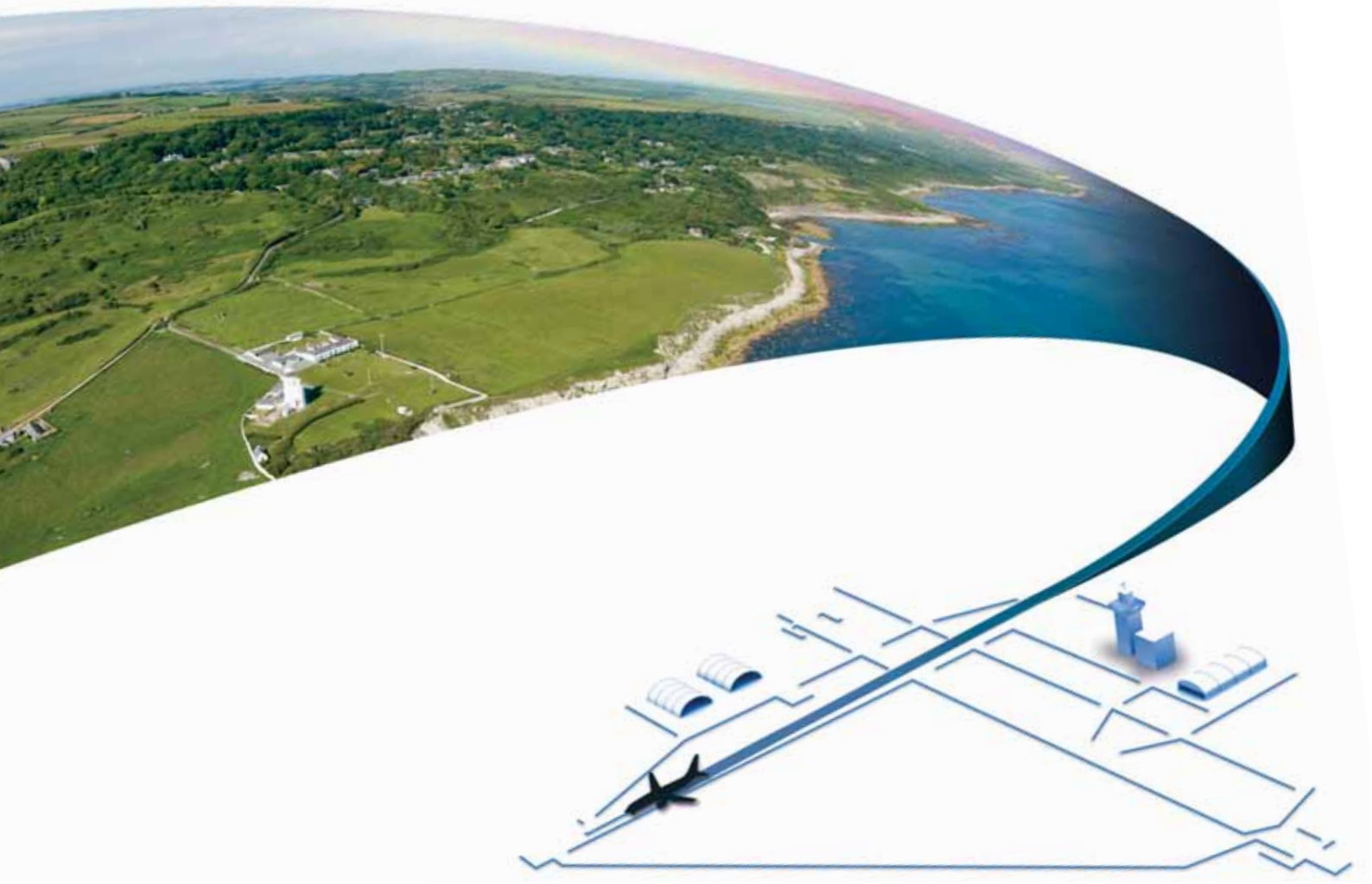


Volume 4 • Issue 2 • July-December 2012

GE Aviation



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The New FAA Senior Representative

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C J Collins serves as the Federal Aviation Administration (FAA) Senior Representative in New Delhi covering South Asia, and has recently returned to the FAA after serving eight years with the International Civil Aviation Organization (ICAO) in Montreal. C J performed ICAO safety oversight audits in 53 countries, including 30 as audit Team Leader, and has worked extensively within the Asia-Pacific region. Prior to her ICAO posting, she served as the FAA program manager for the DOT's Safe Skies For Africa initiative. Her prior FAA positions include regional operations specialist in the FAA's Northwest Mountain Region and principal operations inspector in Portland, Oregon. She holds five FAA certificates: Airline Transport Pilot, Flight Engineer, Aircraft Dispatcher, Certified Flight Instructor, and Advanced Ground Instructor. Her flying experience includes flight instruction, air taxi operations, air ambulance, and flying B-727 for an international airline. She holds a Master of Aeronautical Science degree from Embry Riddle Aeronautical University. Before transitioning to aviation, C J received a Bachelor of Journalism degree from the University of Texas and maintained a career in journalism, including positions with Hearst Publications in New York. C J enjoys art, photography, and travel, and has lived and worked in Ecuador, Mexico, Switzerland, Saudi Arabia, Brazil, and Canada.

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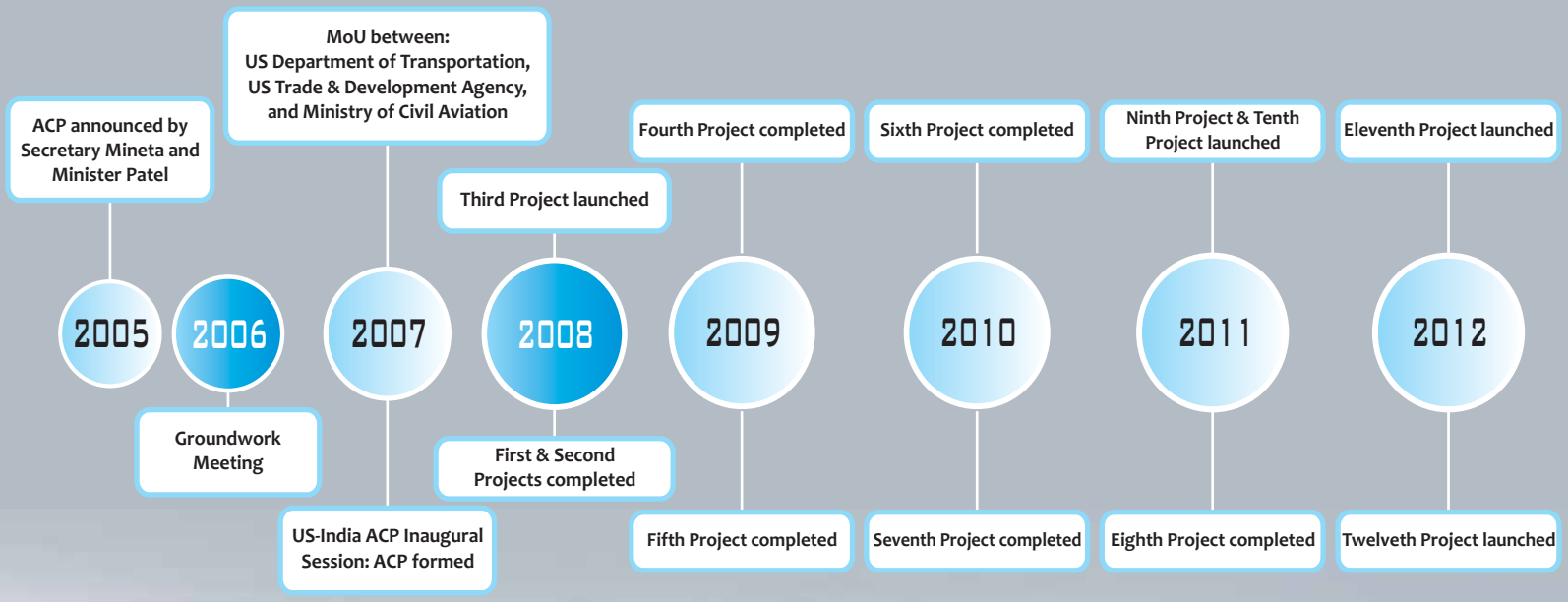
HISTORY



FOCUS AREAS

- Air Traffic Management Modernization
- Airspace and Airport Analysis, Development and Planning
- Aviation Support Industry Development
- Aviation Human Resources
- Aviation Safety
- Aviation Security

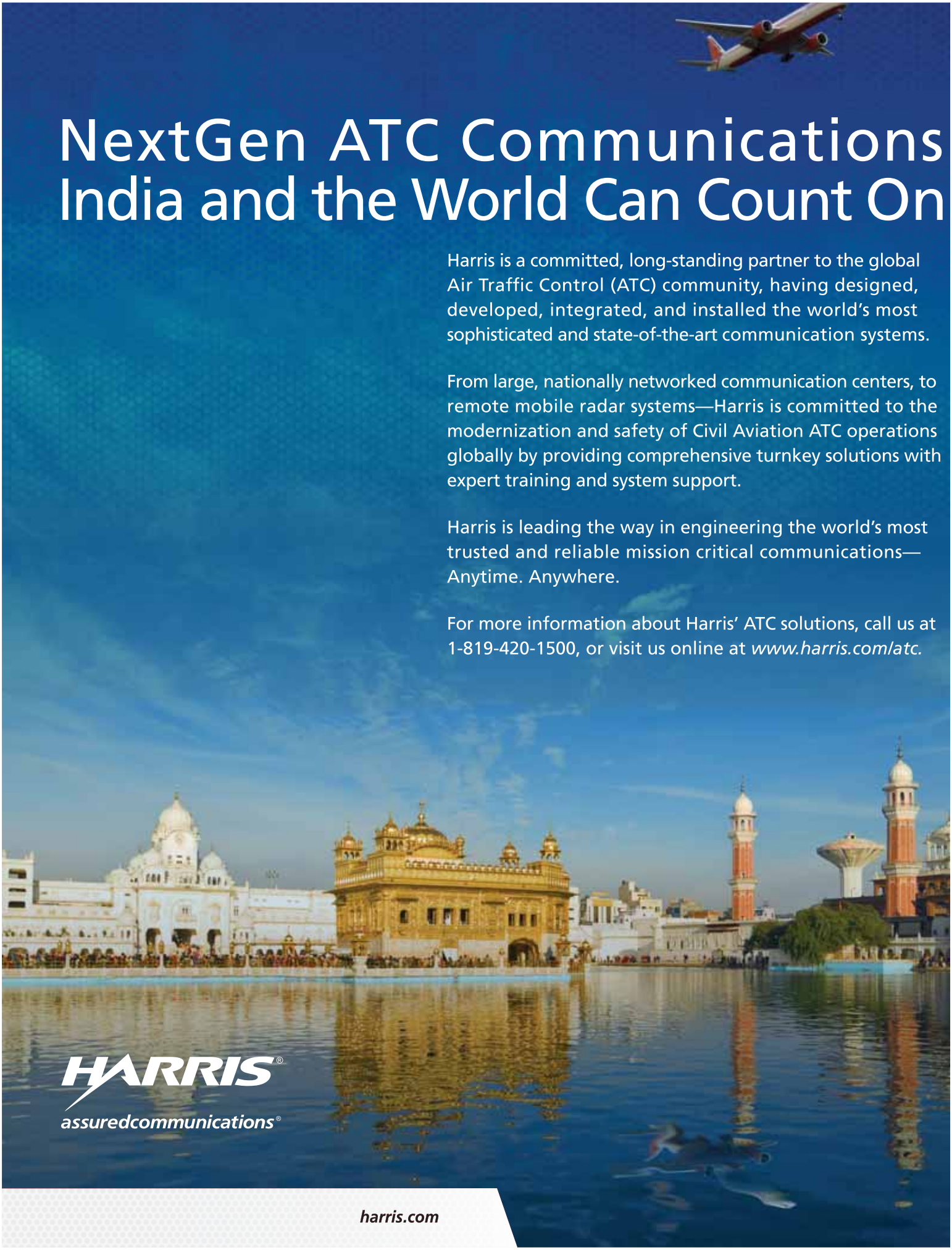
OBJECTIVES

- 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, U.S. 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.

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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Business and General Aviat
Growing Econom

By: Prof. Ajit Nigam, Dr Arj

Introduction

Man has always been fascinated by the birds flying in the sky and wanted to fly like a free bird too. This desire to explore the unexplored mystery is the cause for genesis of the aviation industry. From the beaches of Kitty Hawk to the stealth fighter of the day, the industry has grown by leaps and bounds. The First World War provided the forces necessary for propelling the industry forward as a robust line of defense. Military aviation had its roots during these dark days, while the need for faster transportation resulted in the civil aviation industry. USA has been the home of General Aviation (GA) and a number of practices and procedures have emerged and it is to be seen if the same Standards And Recommended Practices (SARPs) can be transplanted or developed better in the emerging economies like India. Versatility of GA can be seen from its usage in tourism, disaster relief, medical or emergency evacuation, pilgrimage or industrial usage in oil & gas, geological surveys, cleaning of transmission lines, air ambulance in medical services, aerial observations and so on. It provides basic training for a majority of new pilots and later GA acts as a feeder of pilots to scheduled operators. A special use of GA aircraft happens as part of campaigning in a democracy like India, but market has not yet opened as desired.

ion as Force Multipliers in a y: A Case for India

un Singh and Dr M S Pahwa

History of General Aviation

End of the First World War saw the growth of the "barnstormers." Pilots who had participated in the war, post their active defense service, were the harbingers of GA industry, providing services ranging from crop dusting to firefighting. GA deals with private aircraft owners, aircrafts owned by companies, flying clubs, small taxi operators, etc. According to Allen, in the USA, the home of GA, it encompasses the manufacturing, operation, certification of any type of aircraft that has been issued a Certificate of Airworthiness (COA) by the Federal Aviation Administration (FAA), other than aircraft used for scheduled commercial air service (airlines) or operated by the U.S. military.[1] The Air Taxi Survey has listed down a number of factors like air medical services, aerial observations, external load, etc. which have contributed to the growth of GA in the USA.[2] Versatility of GA can be seen from its usage in tourism, disaster relief, medical or emergency evacuation, pilgrimage or industrial usage in oil & gas, geological surveys, cleaning of transmission lines, etc.[3] It provides basic training for a majority of new pilots and later GA acts as a feeder of pilots to scheduled operators. A special use of GA aircraft happens as part of campaigning in a democracy like India. GA is further categorized into Recreation, Personal

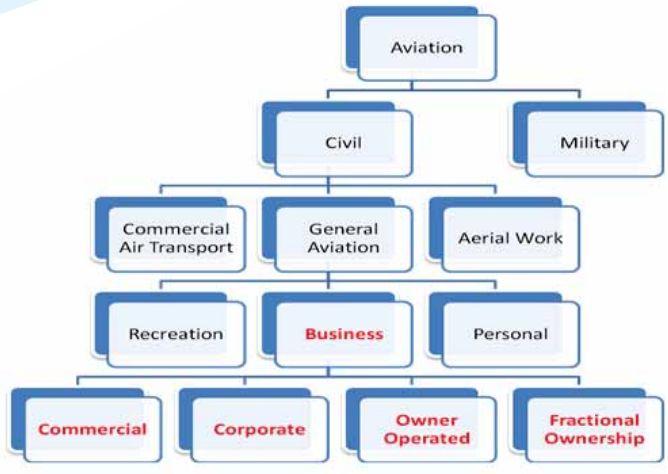

Fig. 2 General Aviation Tree

and Business. Some people use an aircraft for recreational, sightseeing or sports purposes, while others use it as a personal mode of transportation.[4] National Business Aviation Association (NBAA) has defined Business Aviation (BA) as the use of any "General Aviation" aircraft for business purposes. As such, Business Aviation is a part of GA that focuses on business use of airplanes and helicopters. [5]

The Annual Report of International Business Aviation Council (IBAC) elucidates that BA is that sector of aviation which concerns the operations or use of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business, flown for purposes generally considered as not for public hire and piloted by individuals having, at the minimum, a valid commercial pilot license with an instrument rating. [6] The relationship of BA with other branches of aviation is shown in Fig. 1.

The Business Aviation is further subdivided into the following:

Commercial: The commercial operation or use of aircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business and the availability of the aircraft for whole aircraft charter, flown by a professional pilot(s) employed to fly the aircraft.

Corporate: The non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot(s) employed to fly the aircraft.

Owner Operated: The non-commercial operation is a use of aircraft by an individual for the carriage of passengers or goods as an aid to the conduct of his / her business.

Fractional Ownership: The aircraft operated by an entity for a group of owners who jointly hold minimum shares of aircraft. Fractional Ownership operations are normally non-commercial. However, the operation of the aircraft may be undertaken as a commercial operation in accordance with the Air Operator's Certificate (AOC) held by the entity.

Business Aviation: The Force Multiplier

Business Aviation is also considered as a catalyst for economic growth of the country. Corporate houses which use GA aircraft are said to gain competitive advantage, while communities gain job opportunities and access to the nation's extended air transportation system. It tends to contribute to the growth of Gross Domestic Product (GDP) directly and has a number of multiplier effects. It benefits the users of transportation services and the country's economy at large. It increases the efficiency and productivity of businesses by reducing travel time that would be required to drive or to use more congested commercial airports. BA / GA aircrafts have emerged out as force multipliers. The NBAA of USA has studied how companies use their aircrafts for business purposes. They found that customer visits, humanitarian flights, charter revenue flights, corporate shuttles, attracting and retaining key people are some of the ways of utilizing business aviation aircrafts.[7] Table 1 describes the various ways in which a BA is utilized:

Table I: Utilization of BA Aircrafts

Key Employee Travel	Getting the right person in the right place at the right time
Customer Visits	Bringing customers to you
Customer Trips	Visiting customers on their turf

Scheduled Customer Service	Routine trips to service customer accounts
Emergency Customer Service	Rapid response trips to fix what is broken and "put out fires"
Humanitarian and Charitable Flights	Being a good Corporate Citizen, helping employees
Sales and Marketing Blitzes	Multiday/ Multicity sales trips covering a region or sales area
Charter Revenue Flights	Offering your aircraft for use by a Charter Operator
International Flying	Regularly outside the United States
Helicopters	Used to go directly to specific destinations, not just between airports
Management Teams	Transporting to organization sites
Engineering Teams	Transporting Production or Engineering Teams to critical work sites
Corporate Shuttles	Regularly scheduled flights between organization facilities or customer sites
Making Airline Connections	Making airlines connections, particularly international flights
Carry Priority Cargo	Spare parts or mail
Special Projects	Such as advertising shoots
For Goodwill/ Lobbying	Transporting elected officials or candidates, going to law-makers
Utilitarian Purposes	Mapping, aerial surveys or inspections, etc.
Market Expansion	Evaluating new markets or sites
The Airborne Office	Working/ Conferring en route
Personal Travel	Employees and their families
Attract and Retain Key People	A tool to facilitate work or get people home more nights
Maximize Employee	Better than airlines
Safety and Industrial Security	

Though BA is not defined under ICAO, but is represented worldwide through IBAC. The Council has a permanent observer status in ICAO and is housed in the same building of ICAO. Although individuals or companies own the majority of business aircrafts, business aviation can also use arrangements such as chartering, leasing, fractional ownership, time-sharing, interchange agreements, partnerships and aircraft management contracts.[7] With India inching towards its rightful position in an interconnected world, the time has come to focus on the BA. It is also important to understand the Regulatory, Operating and Trading environment both from the perspective of new and pre-owned aircraft. On the other hand, government policy in India remains effectively hostile to GA activity. There are signs that the nation see advantages in opening up airspace and encouraging growth in the GA sector, but at the movement is glacial. [8]

US and India: A Comparative Assessment

General Aviation is growing at a fast pace in India, though in the USA during the later part of the first decade of the millennium, it showed a decline which indicated that this decline would be compensated by growth internationally, particularly from the countries like India. There is an imperative need to collaborate in this vital sector. In the USA, GA is an essential part of the transportation system and that is especially critical for individuals and businesses for both who need to travel and move goods quickly and efficiently in a just in-time market. There are 320,000 GA airplanes operational worldwide, ranging from two seat training aircraft to international business jets to helicopters to others and nearly 228,000 of those 320,000 are operating in the USA. In the USA, GA aircrafts fly almost 24 million hours and carry 166 million passengers annually. Over two-

thirds of the hours flown by the GA aircrafts are for business purposes.

The key point is that GA is the primary training ground for most commercial airline pilots. So GA clearly is a big contributor towards the U.S. economy. It supports 1.2 million jobs and over 115 billion dollars is contributed to the U.S. economy each year through this segment alone. And despite the U.S. economy turndown from 2008 till perhaps mid-last year, GA manufacturing had delivered 7.9 billion dollars worth of aircrafts in 2010. 62% of the manufacturing was tied to eventual exports from the USA. GA is one of the few remaining domestic manufacturing industries that provided a trade surplus for the U.S. and the U.S. exports of civil aviation equipment and services comprise nearly 15% of the exports to India. [9]

India is the ninth-biggest aviation market in the world and in terms of domestic traffic, the fourth-largest in the world behind the U.S., China and Japan and yet India is one of the least penetrated markets in the world. The U.S. Government and the U.S. industry work together with the GoI as well as the private sector in India and the U.S. to develop faster opportunities in GA through government-to-government initiatives and public-private partnership like the US-India Aviation Corporation Program (ACP).

The US-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 in the year 2005, to provide a forum for unified communication between the Government of India and U.S. public and private sector entities in India.
For more information, visit: www.acp-india.com

Keeping the ACP working algorithms in mind, currently the U.S. trade missions are in the process of exploring aviation and airport infrastructure as a key opportunity. There are tremendous opportunities for partnerships in the areas of technology, raw materials, development capabilities, international airworthiness certifications, developing skills and financing. There are various levels of engagement between the two countries.

The Ministry of Civil Aviation (MoCA) and the Federal Aviation Authority (FAA) have a regularly scheduled Joint Aviation Steering Committee. Keeping in mind the growth of aviation business in India, FAA also has a representative office in New Delhi. There is also a homeland security dialogue and through this bilateral dialogue our Transportation Security Ministry interacts regularly with MoCA to exchange data and training methods to ensure aviation security.

Another initiative is US-India strategic dialogue itself. A key deliverable of the India-US strategic dialogue held last June was the signing of the executive agreement portion of the Bilateral Aviation Safety Agreement (BASA). BASA provides for reciprocal inspection and certification of aerospace products and allows for mutual recognition by DGCA and FAA, a big step forward in creating a more cost-effective mechanism for procuring products in India and ensuring increased trade between the two countries.

Government-to-government cooperation comes under the rubric of the High Technology Cooperation Group (HTCG). In 2010, the HTGC added a new sub-committee to deal with aviation infrastructure. Ways to simplify India's flight clearances processes for GA aircraft, GA aircraft import approval processes, the Reserve Bank of India's (RBI) currency restrictions and India's accession on WTO's Agreement on Trade on Civil Aircraft (ACTA) are the areas of cooperation between the USA and India. [9] Joining WTO ACTA would lead to India's elimination of tariffs on aircraft and aircraft parts and go to further accelerate growth in this sector. It will not be out of place to mention India's budget proposal of March 16, 2012, wherein it is mentioned, "Import of aircraft parts is exempt from basic duty" as a right step.

Data in India on scheduled airlines is available and data on non-scheduled and private jets, which constitute GA, is difficult to come by. The biggest challenge, which the GoI is now facing because the sector is predominantly liberalized, is to ensure that, though there is a lot of growth predicted, the challenge is to ensure that the

growth takes place in a safe and an orderly manner. India is known as one of the fastest-growing aviation markets in the world. With the liberalization of the Indian aviation sector, the industry has gone through a transformation with the entry of several privately-owned full service airlines as well as low-cost airlines. BA had faced two years of a very difficult patch and now it has once again resumed its growth trajectory during the last year.

In terms of domestic passenger volume, India now ranks fourth after the U.S., China and Japan. For the first time, domestic travel in India has crossed the 60-million mark in the year 2011, which is a 17% markup of the previous year's figure. This market is expected to grow at around 10% annually to reach a level of 150-180 million passengers by 2020.[10] In order to spur this growth, it would be essential to continue to give top priority to infrastructure, to support this growth and address important issues like taxation, input costs, security, regulation of monopolies, environment as well as issues related to liberalization.

GA is the new kid on the block and is a relatively new segment of the Indian industry. It facilitates emergency medical services, disaster management, offshore operations, scientific research and security as well as law enforcement. The major reason for the rise in demand for BA is that the aircrafts are no longer seen as a luxury but as a tool for increase in growth and productivity. BA is also considered as a catalyst for economic growth. Maximum use of GA is seen in the chartered business in India, tourism as well as offshore operations. BA in India is a niche market, especially since it is relatively hassle free and has instant availability status. The value of additional benefits of private aircrafts is that it can fly to destinations which are not normally covered by the scheduled airlines and have access to smaller airstrips.

However, BA is experiencing a lot of formidable constraints. There are no exclusive guidelines for them. The factors that inhibit growth of BA are mainly the lack of infrastructure and manpower as well as several procedural issues relating to government control. Further, there is an urgent need to increase safety awareness and compliance culture in BA. It is more at risk due to the nature of flying, VVIP carriage, infrastructural issues as well as concerns of the Chief Executive Officers. There is a need to have close monitoring of their operations and DGCA is now gearing up with this end in view and has taken up an initiative in this regard through implementation of Safety Management System (SMS) and their further operations. There is a need to equip and strengthen the aero industry base to cater to the growing aircraft operations but strengthen maintenance infrastructure as well.

Skill Deficiency in Aviation Management

The skill deficiency is expected to become a major constraint in the growth. Skill in the sector is complex as operation in aviation has to be developed and nurtured over a long period of time. Though there are various ways to develop the requisite skill, a good approach could be looked at industry standards and best practices. The ISO standard is a good way, but it does not fit the bill to the tee due to the complex nature of aviation business. The IS-BAO program has been developed by IBAC to tackle such issues and would make things grow in a sustainable and orderly manner from the GA and BA perspective. In many business sectors, international standards are recognized for their role in facilitating global commerce.

IBAC has recognized the need for the business aviation community to take a lead role in fostering harmonization of operating procedures and requirements. IBAC works closely with the ICAO towards international standardization. The President of the ICAO Council has endorsed the efforts of the business aviation community in developing an industry "code of best practice." IS-BAO incorporates the International Standards and Recommended Practices for the Operation of Aircraft applicable to business aviation prescribed in the ICAO Annex 6, Part II for International General Aviation - Aeroplanes.[11] IS-BAO is a code of best practice. It has been developed by the industry for the benefit of the industry. It is the industry's contribution to promoting highly professional operational practices. IS-BAO is intended to build upon the excellent safety record already

established by business aviation. In its simplest form, a uniform operational template that addresses risk-management and problem-solving based on proven procedures in a universally understood manner.

The expected skill shortage in General and Business Aviation could be tackled by training the manpower by the Business Aircraft Operators Association (BAOA). Given the fact that the awareness has to be created and the program launched across India, the following needs to be done:

a) Creation of Sub-Committees
b) Evangelism and Awareness Campaign
c) Workshops / Seminars
d) Identification of test organization
e) Walk through the Certification Process
f) Auditor creation program

Once the skill sets are developed, it will lead to a sustainable growth of General and Business Aviation. Another offshoot of the usage of best practices, apart from safety, would be lowering of the insurance premium as well as pro-business aviation opinion in case of any unexpected liability issues. The standardization and the best practices would also give rise the to creation of aircraft management organizations. Once a critical mass is reached, then IS-BAO would become the de-facto gold standard to follow.

Reduction in Operational Cost

BA is growing at a rapid pace, and India along with Russia and China is considered the fastest-growing market. The acquisition of business aircrafts grew by 66.25% since 2005. Currently, there are over 552 business aircrafts (including rotary and fixed wing) operating in India.[12] The cost of Aviation Turbine Fuel (ATF) constitutes 40% to 50% of the total operating cost.

BAOA members could purchase ATF through Indian Oil at a discounted rate from the market, while Indian Oil is assured of regular purchases by the members of the Association through a loyalty program. This loyalty program could be in the nature of a co-branded loyalty card constituting BAOA and Indian Oil. The Business Aviation segment is a large and valuable segment which is growing at a fast pace in India. The Diner Card for fuelling business aircraft in South Africa is an example of its success.[13] Emulating the example of South Africa with suitable changes for the Indian business environment could result in the launch of a new loyalty program both for Indian Oil and BAOA.

The other way to reduce the operating cost is through reduction in the insurance premium. Using BAOA as an anchor organization, business aircraft operators which are relatively better organized than General Aviation operators could come out with a Group Insurance product for their members. Such an activity may result in the reduction of annual premium to a large extent.

Middle East Business Aviation Association (MEBAA) has been able to create a product which provides a group insurance product to its members. A unique activity by MEBAA is the introduction of MEBAA Aviation Insurance Scheme (MAIS). MAIS is a unique insurance product exclusive to the members of MEBAA. MAIS provides coverage for Aircraft Hull, Hull War, Spares, Liability, Personal Accident and Pilot Loss of License. MAIS will cater for all business jets of the members and including Airbus ACJ A318/A319/A320/A321 and Boeing BBJs aircraft.[4]

Using Business Aviation in India

The acquisition of a Phenom 100 by Kalyan Jewellers headquartered in Kochi, Kerala, in a state where Communism rules the roost, is a harbinger of the times to come. The need to expand the business and yet maintain a work-life balance has resulted in the Chairman-cum-Managing Director (CMD), Mr Kalayanaraman, using the aircraft as a business tool and not as a status symbol or an item of luxury. The group's jewelry chain is spread across Kerela, Tamil Nadu, Karnataka, Andhra Pradesh and Pondicherry. Mr Kalyanaraman feels that keeping a close eye on the business is tough due to the poor commuting options. Videoconferencing is an option, but due to the poor maintenance of the telecom infrastructure and it has also been seen that business travel by air has not come down in spite of videoconferencing. Commuting to small towns like Hubli, Belgaum or Tirupati takes days

simply because there are a limited number of direct air connections. On top of it, Kalyan Group's reason to go for the jet is the time it saves for the promoters in running the business. Mr Kalayanaraman opted for Embraer Phenom 100 because it can land in some of the largest airstrips in the country and this means that some 250 cities and towns that have airports become potential business centers for the group. [14]

Conclusion

The dynamics of metamorphosis in the Indian aviation sector has resulted in the need for a change. The winds of change blowing across the industrial landscape of India are blowing away the mental cobwebs. BA and GA are rightfully beginning to take their place in the sun and business aircraft is increasingly viewed as a tool of productivity and not merely a rich man's toy.

References:

1. Allen, W. B., Blond, D. L., & Gellman, A. J. (May 2006). General Aviation's Contribution to U.S. Economy. General Aviation Manufacturers' Association.
2. (2004). FAA General Aviation and Air Taxi Activity Survey.
3. Business-aviation/uses/. (2011, November 18). Retrieved November 18, 2011, from http://www.nbaa.org/business-aviation/uses/
4. MEBAA. (2012, June 01). http://www.mebaa.com/ProductsServices/MEBAA Aviation Insurance Scheme MAIS/ tabid/147/Default.aspx. Retrieved June 01, 2012, from http://www.mebaa.com.
5. (2011, November 10). Retrieved November 10, 2011, from National Business Aviation Association: http://www.nbaa.org/business-aviation/
6. (2010). IBAC Annual Report. Montreal.
7. (2005). Study on International General and Business Aviation access to Airports. ICAO Secretariat.
8. Royce, D. (2011, January). Pistons Pressured. Aviation Week and Space Technology, pp. 153-154.
9. Reinke, J. (2012). US - India Cooperation. Opportunities and Challenges in General Aviation (pp. 8-14). New Delhi: Indo-American Chamber of Commerce.
10. Bhushan, E. K. (2012). The Way Forward for India: Opportunities and Challenges in General Aviation (pp. 14-18). New Delhi: Indo-American Chamber of Commerce.
11. http://www.ibac.org/is_bao/is-bao-overview. (n.d.). Retrieved May 20, 2012, from www.ibac.org.
12. Singh, K. (2011). Business Aviation in India. New Delhi: IBAE.
13. CAASA. (2012, June). http://www.caasa.co.za/history/. Retrieved June 11, 2012, from http://www.caasa.co.za.
14. Scaria, J. A. (2012, Feburary 11). Jet-set Jeweller. Retrieved March 19, 2012, from economictimes.indiatimes.com: http://economictimes.indiatimes.com/news/news-by-industry/et-cetera/Kerala-billionaire-TS-Kalayanaraman-is-now-proud-owner-of-the-states-first-private-jet/ articleshow/11845053.cms

Abstract:

The objective of this paper is to examine the conceptual framework under which business and general aviation has developed globally and the roadmap for its growth in India. It traces the growth of business and General Aviation (GA) in the United States of America (USA) and its use by various businesses to enhance productivity. The paper also examines various initiatives taken by the Government of India (GoI) in this regard. Methodology adopted for this paper was a combination of secondary research along with interviews with stakeholders. The need to connect tier-II and -III cities through the air transportation network is seeing an avid interest in the growth of business and General Aviation. International Civil Aviation Organization (ICAO) has recently submitted its recommendations to chart out a roadmap for India's General and Business aviation is at a nascent stage and a suitable policy framework is needed for its growth and for ensuring that it becomes a force multiplier in India.

[Note: Prof. Ajit Nigam, University of Petroleum and Energy Studies, Dehradun, is a research scholar under Dr Arjun Singh, Program Director, US-India Aviation Cooperation Program.]

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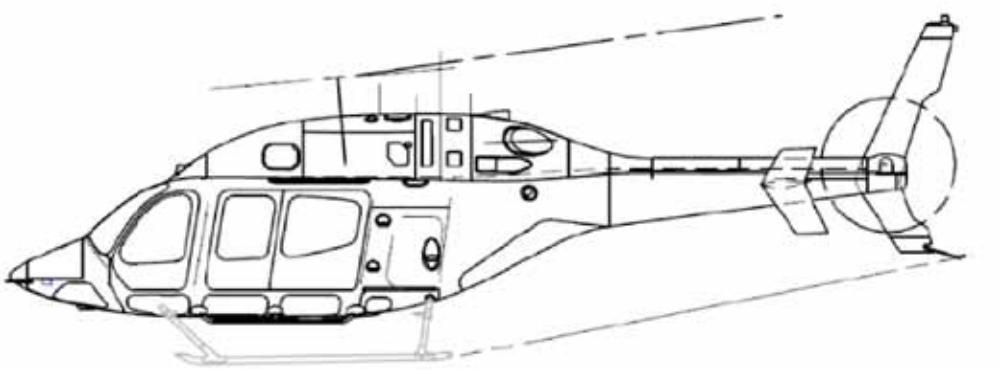
Photo courtesy of Tech. Sgt. Efren Lopez.

Bell 429 GPS-enabled Approach

By: Bell Helicopter

Bell Helicopter achieved new heights in the light, twin-engine class with the certification of the Bell 429 with Wide Area Augmentation System (WAAS) capability. The announcement was made in September 2010, demonstrating a successful partnership among Bell Helicopter, the Federal Aviation Administration (FAA) Global Navigation Satellite System (GNSS) Program Office, Hickok and Associates, Air Methods Corporation, and the Mercy Medical Team. WAAS is an enhancement to the GPS system.

GPS and WAAS



The Global Positioning System (GPS) consists of 32 satellites orbiting earth. GPS is free to the general public all over the world. The European Union launched Galileo and Russia has GLONASS, both similar in function to the US GPS. The typical GPS accuracy is around 15 m, calculating latitude, longitude, altitude, and velocity of an aircraft. The Heisenberg Uncertainty Principle holds true for electrons' velocity and position in an atom, but thankfully it does not hold true for aircraft. However, this marvelous solar system we live in provides a host of phenomena that distort the basic GPS signal and manmade devices have subtle inaccuracies and drift as well. The Wide Area Augmentation System (WAAS) includes more satellites and ground stations in the United States, Canada, and Mexico that provide corrections to the basic GPS system. WAAS is free and is included in Bell 429 aircraft with the fourth axis Automatic Flight Control System (AFCS) kit. The GPS and GEO-augmented Navigation (GAGAN) system, an augmentation to the US GPS, is in development in India, with a projected accuracy of less than 1 m.

Global navigation has improved over centuries. Considering that if Christopher Columbus' hypothesis were entirely correct, wouldn't he have landed on the east side of India? Instead, he named the new ground he walked upon the West Indies. Thankfully, both navigation and navigators continue to bring in new tools and new knowledge. The need for more precise navigation is ever-increasing in today's skyscraper environments. The missions are ever more strenuous, including Helicopter Emergency Medical Services, Parapublic or Aerial Law Enforcement, corporate transportation, and Oil & Gas transportation. Even passengers are ever-increasing. So the Bell 429 was designed to accommodate up to seven passengers plus one pilot. The Bell 429 is the world's most advanced light twin helicopter, integrating a glass cockpit with advanced software on the inside and an industry-leading MSG-3 Certified Maintenance Program on the outside.

The typical helicopter of any class has a "height-velocity curve," a region of altitude and airspeed combinations, where, in the event of a loss of power, the helicopter could not make a safe landing. To avoid this region, landings are made with some forward speed, typically on a defined glide path of 3 to 5 degrees. But with this new certification of WAAS capability, the Bell 429 can

execute a Localizer Performance with Vertical guidance (LPV) approach for up to 9 degrees glide path, for speeds down to 45 Knots Indicated Air Speed (KIAS). A-9 degree glide path at 45 KIAS considerably shrinks the amount of horizontal space needed to perform a safe landing.

Asia is experiencing unprecedented growth. Mumbai has over 1,200 buildings greater than 90 m in height. Hong Kong has over 100 buildings greater than 180 m in height. The Bell 429 can operate Instrument Flight Rules (IFRs) in ceilings as low as 250 ft (76 m) with as low as ½ mile visibility. The addition of WAAS capability implies superior ability to navigate these dense environments. WAAS also features point-in-space approaches, which significantly aids the effectiveness of Health Emergency Medical Services (HEMS) and Search and Rescue (SAR) missions, where time is of essence.

How often does bad weather cause a pilot to redirect to a different landing location, or even worse, cancel a flight? How much revenue is lost because of being unable to complete a mission? Anywhere from 20 to 50 percent of missions are cancelled due to weather. Mother Nature is challenging us to get smarter. With GPS and WAAS, an operator can bank on regaining those otherwise lost opportunities. With Bell's superior reliability built into the game-changing Bell 429, the operators can be certain that the bird is ready to fly when they are.

Bell 429 overall length = 13.11 m

Typical GPS accuracy = 15 m

DGPS accuracy < 5 m

WAAS < 3 m

Bell 429 Automatic Flight Control System

Three-Axis Basic System

The Bell Model 429 is equipped with an AFCS which provides multiple levels of hands-on stabilization and hands-off automatic control. All core components are duplex redundant to provide the high degree of failure protection and reliability required for flight in instrument meteorological conditions (IMC). The baseline system is three-axis (pitch, roll and yaw) with series actuation and automatic trim followup. The pilot-selectable levels of automatic stabilization are Stability and Control Augmentation (SCAS), which provides full-time attitude rate feedback to optimize stability, handling and gust response; Attitude/Heading Hold (ATT), which maintains pitch and roll attitude and magnetic heading as established by the pilot and can be used hands-on with transparent fly-through response or hands-off as desired, and is operable over the full aircraft flight envelope; and Coupled Flight Director (FD), which is automatic flight path following from radio navigation and air data sensor sources.

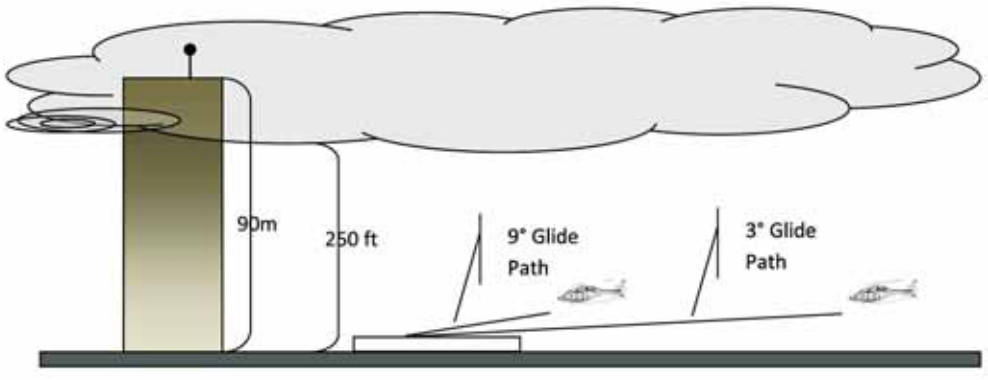
	United States	European Union	Russia	India	China	Japan	Canada	Commercial
Basic	GPS	Galileo	GLONASS	IRNSS	Beidou Compass	QZSS		OmniSTAR, StarFire, VERIPOS
Enhancement	WAAS, D-GPS	EGNOS		GAGAN		MSAS	CDGPS	

Available Lateral (roll axis) modes include: Heading Select (HDG), which maintains heading as selected on the Primary Flight Display (PFD) heading "bug" and is usable at indicated airspeeds above 45 knots.

Navigation (NAV), which captures and tracks selected radio navigation aid and includes VOR, ILS Localizer (LOC), Localizer Back Course (BC) and Flight Management System (FMS) flight plan tracking and is usable at indicated airspeeds above 45 knots; Approach (APPR), which captures and tracks selected radio approach aid and includes VOR, LOC, BC and FMS-based (LNVA) approaches, and is usable at indicated airspeeds above 45 knots; Go-Around (GA), which maintains aircraft on heading existing at engagement and is usable at indicated airspeeds above 45 knots.

Available Longitudinal/Vertical (pitch axis) modes include: Vertical Speed (VS), which maintains climb/descent rate existing at engagement or as selected on the PFD vertical speed indicator "bug" and is usable at indicated airspeeds above 60 knots; Altitude Hold (ALT), which maintains altitude existing at engagement and is usable at indicated airspeeds above 60 knots; Airspeed (ASPD), which maintains airspeed existing at engagement or as selected on the PFD airspeed indicator "bug" and is usable at indicated airspeeds above 45 knots; Altitude Preselect (ALTS), which captures and maintains altitude set in the PFD altitude preset "window" and is usable at indicated airspeeds above 60 knots; Go-Around (GA), which captures and maintains 750 feet/minute climb rate and is usable at indicated airspeeds above 60 knots.

Also available in Longitudinal/Vertical mode: Approach (APPR), which captures and tracks ILS glideslope (GS) or FMS-based vertical guidance (VNVA) and is usable at indicated airspeeds above 60 knots. Helicopter-specific steep (> 3 degrees) LPV approaches are approved for the 429 equipped with a three-axis AFCS. However, the required approach airspeed is less than 60 knots. Steep glideslope angles require operation at low airspeeds, where control of the vertical path with pitch attitude is inappropriate (flying on "back side of power curve"). Therefore, it is necessary to use airspeed hold on the pitch axis and maintain glideslope tracking manually with collective.



Four-Axis Kit Add-On

Optionally available is a four-axis kit which enhances coupled flight director operation. The four-axis option automates the collective pitch axis, thereby permitting both longitudinal (airspeed) and vertical (altitude, vertical speed or flight path angle) axes to be controlled simultaneously. Available FD modes for the 4-axis system are the same as described above, with the following differences in the vertical (collective axis): VS, ALT, ALTS, GS, where the pitch axis controls airspeed while collective controls vertical path and coupled operation is extended down to 45 knots, where the system automatically maintains the aircraft within allowable operating limits, including engine and transmission power, airspeed and altitude; VNVA, with the four-axis kit, fully coupled GPS-based LPV approaches with helicopter-specific geometry are possible, where glideslope angles of up to nine degrees are accommodated. So this capability provides significant workload reduction compared to the three-axis configuration; GA, which captures and maintains 750 feet/minute climb rate, and accelerates or decelerates to 70 knots indicated airspeed.

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– **Ted Gavrilis,** Former President
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The Company's global air-and-ground network keeps growing. So it's no surprise to hear that around 3.6 million shipments are made each business day. Today, FedEx connects markets that account for more than 90 percent of the world's gross domestic product, within one to three business days.

FedEx has been in India since 1984. The Company started operations in India through a Global Service Participant (GSP). It has had a direct presence in the country ever since 1997, and has set new benchmarks.

- It is the only express transportation company to provide three gateways into and out of India: Mumbai, Delhi and Bengaluru.
- It has 31 weekly flights connecting India to the world.

As India grows, FedEx is busy keeping pace. How to keep customers satisfied, how to keep employees productive and how to contribute to the Indian society is important. This is why FedEx has a very special mission for India. FedEx India's mission is: Establish FedEx as a carrier of choice, employer of choice and neighbor of choice.

The Carrier of Choice

FedEx wants its customers to know that they are improving India's access to the world on a regular basis. So moving things in a fast and smart way is exactly what FedEx keeps working on.

Growing direct sales and operational coverage in India is of great importance at FedEx. This is bearing fruit. The Company is reaching more and more Indians every day.

The Employer of Choice

FedEx is, first and foremost, a people-centric company. This has had immediate payoffs: the goodwill and loyalty that people feel for FedEx keeps growing.

The Company's People-Service-Profit (P-S-P) philosophy is part of every business decision. And employees feel very enriched by the progressive policies of FedEx. The innovative programs and benefits that the Company offers, makes the workplace stimulating.

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 recognized, Great Places to Work Survey (GPTW) in India.

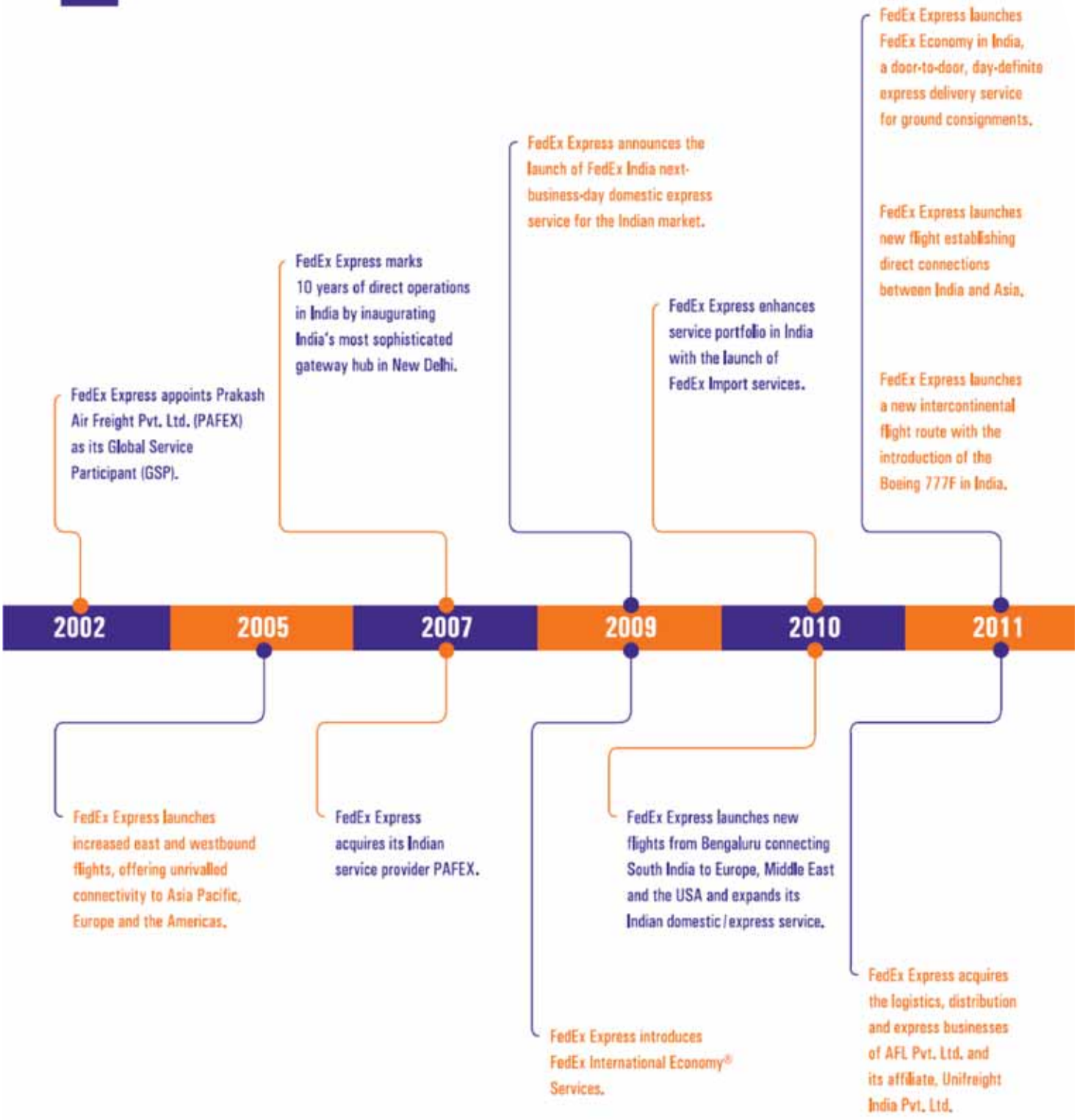
The Neighbor of Choice

If you have ever wondered what FedEx does for the citizens of the countries they operate in, here's a news. Communities in the host countries also benefit from the P-S-P philosophy. FedEx leads the way in philanthropy, corporate governance and caring for the environment.

The Company supports humanitarian issues. Contributing to communities through education, cultural and civic causes are always important. Help given may be financial or in kind.

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.

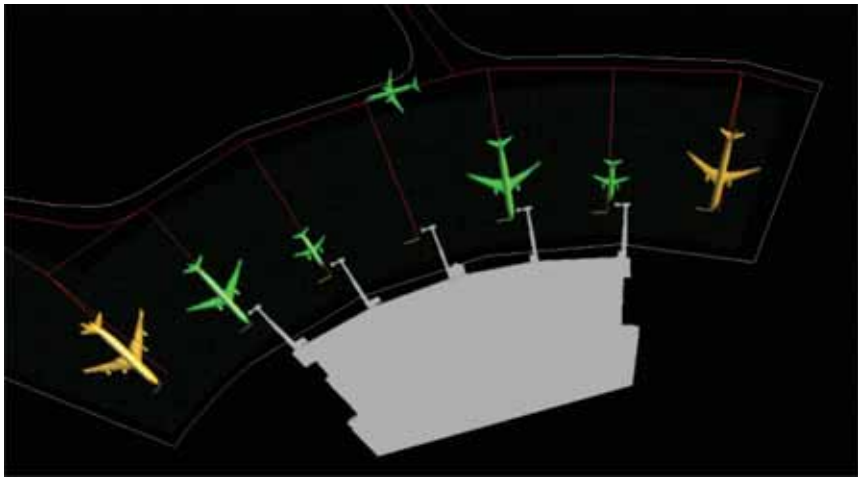
Growing in leaps and bounds in India



Total Airspace and Airport Modeler (TAAM)

By Jeppesen

Jeppesen's TAAM® - Total Airspace and Airport Modeler - is a fast-time gate-to-gate simulation tool that accurately predicts and analyzes the impact of present and future airspace and airport operations, while maintaining safety and efficiency. TAAM is the premier gate-to-gate simulator of airport and airspace operations commercially available. This sophisticated software tool simulates 4D (3D plus time) models of airspace and airports to facilitate decision support, planning and analysis.



An ATM analyst can develop models of airports and/or airspace with the help of TAAM simulator, and then evaluate the impact of changes to infrastructure, operations, or schedules. It enables the operator to identify the system benefits of changes such as re-architecting sectors, changing ground or airborne procedures and runway configurations, or determining when airspace saturation is likely to be reached. Recognized as a standard in the aviation industry, it is widely used by major air navigation service providers (ANSP), air carriers, leading airport operators, as well as aviation research establishments, consultants, system integrators and universities around the globe. Users of the TAAM product typically report the following business benefits:

A. Efficiencies can be increased due to:

- Improved performance and utilization of ATC systems
- Increased productivity of existing resources
- Increased capacity as a result of better management of existing and future traffic volumes

B. Operating costs can be substantially reduced due to:

- Reduction of ground and airborne delays
- Reduction in operating and fuel costs
- Better management of existing infrastructure and resources
- Optimization of future investments in infrastructure through better planning and timing
- Reduction in workload through improved load balancing

TAAM Summary of Principal Features

- Unmatched fast-time and accurate "real world" simulation capabilities
- Configurable to any size airport or airspace to produce micro- or macro-level ground and airside models
- Generate unlimited "what-if" scenarios
- 4D full airspace and flight profile calculations
- A flexible rule-base to accommodate different modeling requirements
- Randomized aircraft flight characteristics for most realistic results
- Electronic data input using industry-standard data for more efficient simulation model set-up
- Realistic 3D multi-color models of airports, aircraft and airspace to assist analysis and presentations
- Direct output to spreadsheet and database tools for further analysis
- Create highly detailed reports and 3D graphics for rich analysis and presentations
- Output detailed flight data metrics in standard formats for easy input into industry environmental noise and emissions tools
- Detailed Ground functionality, including: stands (Gates, Deice Stations, Long Term Parking Positions, Standoffs), terminals, pushback paths, taxiways, runways and aprons
- Detailed Airside functionality, including: terminal airspace, en-route and oceanic airspace, Conflict Detection, Flight Level Allocation System (CVSM / RVSM), Flow Management, In-trail separation, Wind (terminal and En route), SIDs/STARs – in one seamless application
- Statistical data generated in a wide variety of report forms at different levels of detail

Benefits for Civil Aviation Authorities (CAAs) and Air Navigation Service Providers (ANSPs)

- Analyze the impact of global growth in air traffic
- Increase traffic flow and airspace utilization while maintaining safety
- Analyze capacity for national route systems with current and future traffic levels
- Redesign, resectorization and reclassification of airspace
- Measure benefits of reduced vertical separation minima
- Evaluate the implications of introducing new en-route and terminal procedures
- Assess the impact of changes in controller workload due to traffic growth, new airspace designs and procedures

Benefits for Airports

- Reduce congestion and delays while maintaining safety
- Capitalize on more efficient use of existing airport infrastructure and resources
- Increased capacity means greater revenues from landing fees
- Plan for the introduction of new aircraft types
- Evaluate financial implications of future infrastructure investments, including new terminals, additional gates, taxiways or runways
- Improve irregular operations
- Cost-effectively plan noise abatement, de-icing and other operations
- Measure the impact of disruptions, such as proposed runway construction, on your schedule and operations
- Assess the effect of changes in sequencing strategies and separation standards

Benefits for Airlines

- Cost-effectively plan for operations, fleet changes, aircraft substitutions, de-icing and other procedures

- Enhance competitiveness and profitability through reduced fuel use, shorter delays and efficient block times
- Optimize schedule design from early stages to ongoing adjustments
- Manage past performance and train operations staff to handle disruptions more efficiently
- Analyze the initiatives of the national or local air navigation service providers and determine potential impacts on your operation
- Propose initiatives to air navigation service providers to reduce delays and increase efficiency

Airports Authority of India (AAI) high-level requirements for Indian airspace optimization

Air Space Management (ASM) team of AAI expressed interest in using the Jeppesen TAAM simulation tool, in order to increase the capacity of Indian airspace under its responsibility and to enhance traffic flow levels in the immediate and medium term. AAI ASM experts have stressed that simulation and modeling processes should be focused on upper airspace harmonization and enhancement of its traffic flow capacity. Presently, the Indian en-route airspace is structured in 4 (four) Flight Information Regions (FIRs): Chennai, Delhi, Mumbai and Kolkata and the traffic management within the 4 FIRs is conducted from 12 Area Control Centers (ACCs). As per the AAI's existing plan for Upper Airspace harmonization of the complete Indian airspace, 11 ACCs will be amalgamated into 4 ACCs initially and finally into 2 Area Centers (UACCs). Therefore, the plan shall be carried out in two phases.

In Phase 1, each FIR will have only one Upper ACC with multiple sectors operated from four major ATCCs. This will enable the application of uniform radar separation throughout the Continental airspace and enable the application of reduced horizontal separation in the remaining Oceanic airspace.

AAI has already completed a pilot project of Chennai FIR where an Upper ACC (UACC) center with five sectors have been successfully integrated with 10 radar equipments for enabling seamless upper airspace with lower limit of FL 255. The lateral jurisdiction of existing ACC centers (Hyderabad, Mangalore and Trivandrum) has been re-defined. The process of integration of radars and Upper ACC for Delhi, Mumbai and Kolkata FIRs is underway. Therefore, the Airports Authority of India is looking for Jeppesen's TAAM airspace simulation and modeling capabilities to perform an airspace analysis during the UACC harmonization project.

AAI's main goal is to have TAAM as a decision support tool that will allow validation of an "expert theory", and/or allow AAI ASM experts to experiment with a range of solutions that are all viable, but they may have different costs associated. Also, there is a specific requirement regarding airspace capacity. It has been emphasized that, although TAAM will not tell what an ideal capacity is, however, given a schedule, the results from TAAM can tell the user (AAI) what the sector movement numbers are for a given scenario, allowing the user to determine whether that number causes a capacity constraint. The capacity of the airspace is a figure that must be decided upon by the regulators, and how they measure that constraint is their own internal issue.

Conclusion

Indian airspace has been designated as Reduced Vertical Separation Minima (RVSM) exclusive in Oceanic airspace and RVSM non-exclusive in the Continental part of the national airspace. The RVSM concept implementation has been in force since 2003. AAI expectations are that TAAM can tell them from running different scenarios, how each scenario measures up against that set capacity. Also, AAI is anticipating that Jeppesen TAAM experts will help them to decide on an appropriate capacity figure or a formula to derive this value. Jeppesen simulation and modeling service to AAI may also include into the scope of work the TAAM analysis work for a homogeneous and standardized RVSM implementation.

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Air Traffic Control turns to Dynamic Routing for Enterprise-Wide Voice Communications

Contributed by Harris Corporation

Voice Communication Control Systems (VCCS) serve as a nexus for various air traffic control resources, among them being Very High Frequency (VHF), Ultra High Frequency (UHF), and High Frequency (HF) radios, as well as weather information displays and Air Traffic Flow Management (ATFM) systems. Typically, these elements are integrated on a "LOCAL" level – at an individual airport or flight control center, for example.

The drawback to this approach is that it creates a silo of communications capabilities, integrated only within the single location. The system operates independently of other VCCS systems within a country or region, and often uses different equipment providing varying capabilities. This poses significant drawbacks in an increasingly interconnected, digital world.

How to solve this challenge, going forward? Air traffic control organizations are looking to the application of Internet Protocol (IP)-based systems to provide effective voice control and data communications capabilities across the total enterprise. This includes the US Federal Aviation Administration (FAA) as well as European agencies, which are seeking to modernize their VCCS with platforms that deliver new technology and capabilities across the voice enterprise.

Why IP is a Reliable Solution for VCCS

VCCS networking today means much more than voice communications. ATFM, weather, voice, radar, Remote Control Air-to-Ground (RCAG) and other applications are shared or must be available, wherever needed. Using IP to network VCCS and other sites provides the solution.

Only one primary connection and one alternate for critical sites are required to provide access to all sites connected to the network. Network routing equipment sends the data packets along a network using the most efficient available route. IP also provides error-correction schemes to ensure data integrity. In addition, bandwidth is shared among applications, supporting burst mode requirements, and can be adjusted quickly without a major infrastructure change. The routed IP network is self-healing and adapts immediately to path failures, increasing reliability.

There is little question that industry data clearly show a trend toward an all-IP design for modern voice communication networks. In 2000, 94% of the global PBX shipments were Time Division Multiplexing (TDM) switches. By 2011, 92% of the global PBX shipments were IP systems. IP systems are replacing legacy TDM systems in many mission-critical applications, from military command and control operations to commercial call centers.

IP is, in fact, a reliable and effective means of communication that allows us to do many things that TDM did not:

- Connect dissimilar devices – transmission path timing and format are no longer critical
- Connect many devices together in a network rather than each device being connected one-to-one, as with TDM
- Share bandwidth – costs are reduced by utilizing common communication links
- Reduce manually intensive configuration – IP is software-controlled and self-adjusting, while most TDM applications require that new configurations be initiated manually.
- Less cabling and equipment is required with IP, many self-healing connections are possible not only with large networks but also small networks such as VCCS position equipment. Rings, hub and spoke, web, are all possible with a minimal amount of equipment and cable when compared with TDM installations.

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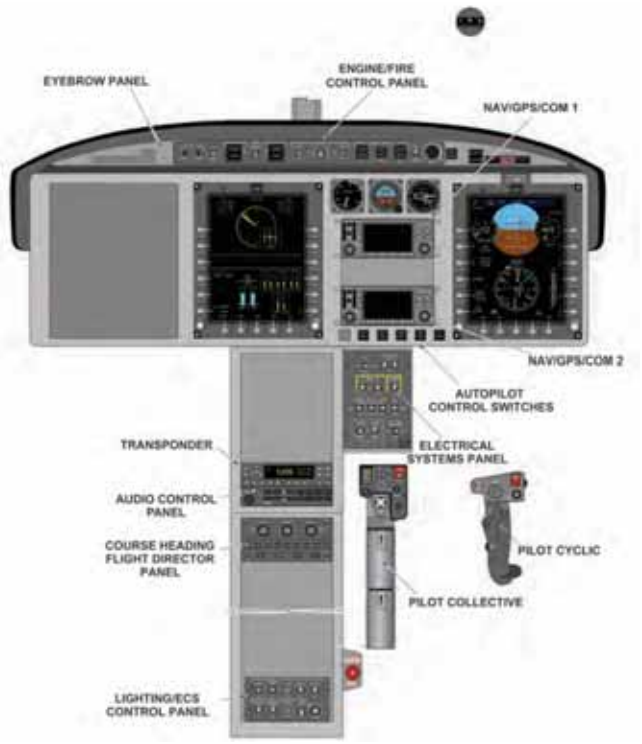
STANDARD CONFIGURATION SPIFR



The standard configuration for the Bell 429 provides single-pilot IFR capability with 3-axis stability and control augmentation (SCAS) and a coupled flight director capability. All Engine Indication and Crew Alerting System (EICAS) display functions are provided through the Bell BasiX-Pro™ Avionics System. The system works in conjunction with the engine control units (EECs) for the dual Pratt & Whitney electronically-controlled PW-207D1 engines. Other aircraft systems interfaces, warnings, cautions, aural alerts, and automated performance features are provided through the remotely located Aircraft Data Interface Unit (ADIU).

COMMUNICATIONS & NAVIGATION -- The Bell 429 standard configuration for Communications Navigation and Surveillance (CNS) consists of dual Garmin GNS-430W NAV/COM/WAAS GPS systems, with a kit option to replace one of these with a GNS-530W. The standard system also includes a GTX-330 ELS compliant Mode S transponder, a PMA-7000H Audio/Intercom Panel with VOX and Integral Marker Beacon Receiver, and an ARTEX C406-N-HM Emergency Locator Transmitter (ELT).

DISPLAY UNITS -- The Multi-Function display units are "smart displays," which include the processing required to collect sub-system information and generate display formats and graphics for the following:

- All primary flight and navigation instrumentation
- Presentation of flight director and autopilot status
- Engine and rotor drive system indications
- Electrical, hydraulic and fuel system monitoring
- Crew alerting system (warnings/ cautions/ advisories and aural alerts)
- Navigation route mapping display
- Presentation of optional Traffic Collision Avoidance

The primary components of the Bell BasiX-Pro™ Avionics System in the Bell 429 include the following:

Two Multi-Function Display Units (DUs) with 6 x 8 inch high-resolution displays	Dual Channel Aircraft Data Interface Unit (ADIU)	Dual Digital 3-axis Automatic Flight Control System (AFCS)	Dual Channel Air Data Attitude Heading Reference System (ADAHRS)	Course/Heading/ Flight Director Panel (CHFD)

Symbology (TCAS)

- Presentation of optional weather radar or search radar information
- Presentation of optional Forward Looking Infrared (FLIR) / Enhanced Vision Systems (EVS) video display (either NTSC or PAL standard)
- Presentation of general color video display or digital map display (NTSC or PAL standard in either S-Video or Component RGB video)
- Presentation of electrical, AFCS, and fuel / weight and balance summary information
- Presentation of automated power assurance, Category A performance, and hover performance calculations
- Presentation of maintenance and diagnostic data

Automatic Flight Control System

CONFIGURATION FLEXIBILITY TO MEET OPERATIONAL NEEDS

The BasiX-Pro™ includes built-in provisions to allow customized configuration of the following equipment:

- Alternate FMS / GPS systems
- Alternate ARINC-429 radio navaids
- UHF / VHF Direction Finder or 2nd ADF
- Weather / Search Radar
- FLIR / EVS display (either NTSC or PAL standard)
- Designator Control Panel (allows FLIR or radar cursor designated positions to be captured as waypoints)
- General color video display or digital map display
- Velocity Sensor (for hover cues and / or search and rescue approach options)
- Programmable CAS messages (cautions / warnings / advisories)

A third display unit for the co-pilot position is available for the Bell 429 as an optional accessory.

Safety Enhancements

Bell Helicopter is at the forefront in providing multiple ways of satisfying evolving requirements in helicopter traffic management, flight following and terrain awareness safety. The Bell 429 is the first helicopter in the light twin category to provide fully-coupled steep (9-degree) LPV WAAS (Localizer Precision with Vertical Guidance Wide Area Augmentation System) approaches. The Bell BasiX-Pro™ Integrated Avionics System concentrates on providing true operational capabilities and flexibility to our customers to address rapidly-changing regulatory requirements and technologies, with an open architecture and flexible avionics system solutions.

The enhancements available for the Bell 429 through optional accessory kits and customizing include:

Traffic Advisory System (TAS): Two TAS systems available:

- Avidyne TAS605 (recommended) features 13 nm range; 5,500 ft vertical separation; and 55,000 ft service ceiling.

  - Will be upgradable to Avidyne TAS605A for ADS-B when available from Avidyne.
- Avidyne TAS620 features a 21 nm range, 10,000 foot vertical separation maximum, and 55,000 foot service ceiling.

  - Upgradable to Avidyne TAS620A for ADS-B.

Helicopter Terrain Awareness and Warning System / Enhanced Ground Proximity Warning System:

Three H-TAWS and EGPWS H-TAWS options are available to satisfy the 7,500 lb Increased Internal Gross Weight equipment requirement.

- Garmin GNS-530W with H-TAWS: Class B H-TAWS system, available as a Bell Helicopter optional accessory kit for the GNS-530W NAV/COM/GPS with Garmin system software 4.0 rollout.
  - Lightweight, lowest cost solution.
  - Displays on GNS-530W only.
- Honeywell Mark XXI EGPWS H-TAWS: Class B H-TAWS system available as customizing.
  - Installation with or without weather radar.
  - Displays on BasiX-Pro™ Display Units, underlaid on PFD HSI format or MFD Map / Radar format.
  - Uses same input as weather radar.
  - Provides only one TAWS image (one range setting only).
- Honeywell Mark XXII EGPWS H-TAWS: Class A H-TAWS system available as customizing, adds the following features:
  - Interfaces with ADC and Rad Alt.
  - Provides dual TAWS images with independent range control.

H-TAWS Displays "Under Glass" Available with Either Mark XXI or XXII EGPWS H-TAWS

Garmin GNS-530W with H-Taws

Garmin GNS-530W with H-Taws

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Pushpak-Supersonic Part-III

The Indian air transport industry as a whole was passing through a difficult period; part of Chairman Tata's speech at the last annual general meeting of Air India Ltd., before nationalization, held on June 22, 1953, described the rather sad state of affairs of the industry. "It is with a heavy heart that I address you today for the last time. In a little over a month, as government would take over all air transport operations, this company will cease to exist as an airline." The nationalization of air transport brings to a close an era of twenty-one years, during which from a small beginning the Indian air transport industry grew into the far-flung domestic and international system of today. As it is fashionable in some quarters to decry free enterprise, let it be remembered that the highly developed Indian air transport system which the Government of India (GoI) are acquiring ready-made and at a small cost was built up wholly by private enterprise in spite of the many difficulties and restrictions placed in its path.

"The history of Indian air transport since 1932 may be conveniently divided into two clearly defined periods separated by the war. Of the first, from 1932 to 1940, little need to be said today except that it was a hard but satisfying era of pioneering during which the industry, enjoying freedom of decision and action, grew slowly but steadily and laid the foundations for the large-scale expansion which came after the war. I personally look upon that era with nostalgia because it gave me the opportunity to make a personal contribution to it, both as pilot and administrator..." The second period, from 1946 to the present day, has been marked by tragic mistakes and presents many valuable lessons for both the private and public sectors of the industry.

The period was influenced at the start by two important factors. One was the availability of low cost of larger and more efficient transport aircraft than were used in India before the war. The other was the excellent post-war plan of orderly development under the State control prepared by Sir Frederick Tymms, then Director General of Civil Aviation. Although, potentially, both factors were favorable in the growth and success of the industry, they were turned into instruments of its ruin. India's nationalization of air transport in 1953 resulted from two major influences: (a) increasing financial difficulties of the air carriers, the causes of which were not fully understood by the Government and the public alike; and (b) the advocacy of the Government ownership of all business.

The irony of this doctrine was that the past mistakes of the Government had been responsible in a large measure for the airlines difficulties. Yet, the future of India's air transport was now to be entrusted entirely to the Government. The previous mistakes by the Government were well documented in the Report of

the Air Transport Inquiry Committee (ATIC). According to the Committee's findings, the Government's most serious error was agreeing to the Air Transport Licensing Board (ATLB) issuing licenses to far too much post-war competitive service.

These were the fundamental causes of India's air transport difficulties as seen by the Inquiry Committee in its October 1950 report. However, other factors were recognized, such as the over-capitalizations that were approved, Government's insistence on lowering fares with little regard to profits and, probably most important of all, the very heavy import duty on high octane aviation gasoline that were in use then. The gasoline tax probably was the highest of any country in the world and accounted for a significant proportion of operating expenses. One authority estimated, for example, that if the domestic trunk routes in the United States had to bear such a prohibitive tax, their profits would quickly have turned into losses. Other costs, especially for spares, also increased steadily during the inflation caused by the Korean War. Moreover, adequate stocks of spare parts were hard to maintain, regardless of price.

The eight private airlines were given cash and the Government guaranteed 3.5% Indian Airlines Corporation negotiable bonds, redeemable in five years, for their aircraft and other fixed assets. No allowance was made for goodwill or other intangibles. Total compensation, including that for Air India International, amounted to approximately Rs.47,000,000=00 of which only 10 % was paid in cash.

With the passage of an Act of Parliament passed in May 1953 nationalizing the country's scheduled air transport system, Indian Airlines Corporation (IAC) came into being on August 1, 1953, as a going concern, the assets, liabilities and business of the former eight scheduled airlines of the country operating domestic and short-distance international routes, namely, Air India Ltd, Air Services of India Ltd, Airways (India) Ltd, Bharat Airways Ltd, Deccan Airways Ltd, Himalayan Aviation Ltd, Indian National Airways Ltd and Kalinga Airlines. Of these eight companies, three had been operating since the pre-war years, Air India (as Tata's Aviation Department) was founded in 1932, Indian National Airways the following year and Air Services of India in 1936. All eight airlines were privately owned, except for Deccan Airways in which the Indian Government held a majority interest (inherited from the Government of the Princely State of Hyderabad).

At the start, the eight domestic airlines, which became part of IAC, were continued as separate divisions, designated lines. Each line operated a number of services on allotted routes and was responsible for its own administration. At the outset, Indian Airlines inherited a fleet of 99 aircraft consisting of 74 Dakotas (DC-3s), 12 Vickers Vikings, 3 Skymasters (DC-4s), and the remaining an assortment of smaller aircraft of various types. In July 1954, the airlines ordered right 14 passenger de Havilland Herons for use on feeder routes. This was followed next year by orders for ten turboprop Vickers Viscounts for long-haul trunk line services that were being flown mainly by Vikings. After studying available types in the world market, Indian Airlines ordered four Caravelle twin jets for delivery in 1964. The carrier reportedly preferred the larger Boeing 727 which had a lower seat mile cost, but the French offered such attractive financial arrangements that the Caravelle was chosen. The deal was partially a barter arrangement, with the French taking Indian goods in

Air India's Chairman JRD Tata with his wife on the occasion of the 30th anniversary of his Karachi-Ahmedabad-Bombay flight from Santa Cruz airport. The Puss Moth of the 1930s is dwarfed by Boeing 707 of the 1960s.

part payment, thereby conserving India's foreign exchange. The strength of the Caravelle fleet eventually reached seven.

IA successfully employed the similar arrangement in securing modern equipment to upgrade secondary services, first with Fokker F-27 turboprops and, later, with HS-748s. The HS-748 deal differed, however, in that this plane was assembled by the Kanpur Division of Indian Air Force and which was amalgamated with Hindustan Aircraft Ltd and later renamed Hindustan Aeronautics Ltd, under license from Hawker Siddeley- which became part of British Aircraft Corporation, today's British Aerospace. Whatever the case, Indian Airlines took a big step forward early in 1970 when it finally secured the Government's sanction to place an order for seven Boeing 737-200s for late 1970 and early 1971 deliveries. The airline ultimately acquired 25 Boeing 737-200s for its fleet. The airline completed its evaluation in 1968, but the decision had to be studied by several Government committees before the foreign exchange allocation could be approved. Although IA could have generated enough foreign exchange to pay for the aircraft over their useful life, it needed a large outlay that had to be weighed carefully.

More importantly, perhaps, to the extent increased capacity encouraged tourists to come to India, the project enhanced the airline's ability to earn vitally needed foreign exchange. This, in turn, could lead to reduction in the Government's heavy duty on Aviation Turbine Fuel (ATF), the highest in the world, with the result that fuel then accounted for about 29 percent of IA's total operating cost. Requests to bring down the tax thus far had been unsuccessful. Meanwhile, the Government exercised the option to acquire the additional 2% stake in Air India International Corporation in 1953, increasing its holding to 51%. The Government did have two representatives on the Board of Directors, but the day-to-day affairs were managed by the Tatas. Originally, Tata Sons Ltd was Secretaries and Treasurers of the company (Air India International) and Air India Ltd, its General Technical Managers and Chief Booking Agents in India, Pakistan and Ceylon. The office of Secretaries and Treasurers was later transferred to Tata Industries Ltd Tata's domestic carrier, Air India Ltd, was making remarkable progress and was showing an encouraging trend in earnings. But the condition of the domestic airline industry, as a whole, was rapidly approaching chaos, which gave the proponents of State ownership new reasons to urge nationalization. Their goal was realized in 1953 with the passage of the Air Corporation Act in March that nationalized the entire industry, domestic as well as international. Prior to nationalization, Air India International Ltd replaced its older Constellations and acquired four Lockheed Model 749-A Constellations. It had also ordered two Super Constellations, Model 1049C. The Corporation took over these aircrafts too under the obligation of the purchase contract. The new equipment was delivered in June 1954, and put into operation shortly thereafter. With the acquisition of Boeing 707s, the company opened jet services between London and New York with a frequency of three flights per week in May 1960.

Air India International financed its initial Boeing jet program, in part, through US loans totaling Rs.79,800,000, of which Rs.53,200,000 was subscribed by a group of private banks, and Rs.26,000,000 by the World Bank. The loans were guaranteed by the Indian Government. Air India continued to expand its network and frequencies as more jets were acquired. At the beginning, it bought several Rolls Royce engine standards Boeing 707s. Then, it switched over to the longer range Boeing 707-320s, powered by more efficient Pratt & Whitney engines, starting in 1964. That same year saw two important additions to Air India's network. After the nationalization of airlines in August 1953, Air India International, together with its main structure and personnel, and the management of the airline, continued operating almost undisturbed, J.R.D. Tata continuing to guide the airline as its Chairman. Air India Ltd, the domestic carrier, on the other hand, was merged with seven other operators to form Indian Airlines, the domestic carrier, but JRD was associated with it too as a member of the domestic carrier's Board of Directors. On August 1, 1953, Air India International Corporation took over, as a going concern, the assets and business of Air India International Ltd, and continued as the international flag carrier of the country.

To quote JRD from the first annual report of the nationalized Air India International: "Ours (task) was to 'disintegrate' the previously integrated organization of Air India Ltd and Air India International Ltd and building

a self-contained airline with its own workshops, ground services, offices and sales organization." The first of the Super Constellations, Rani of Jhansi, had arrived Bombay on June 6, 1954. The 76-seat (in first class and economy configuration) Super Constellation flight to London was inaugurated on June 19, 1954. The forward-looking carrier realized the importance of the coming jet age and joined the elite of pioneer world airlines which would help usher the new Era of Jet Age: All became the first Asian airline to place an order for a jetliner in 1956, more than two years before the Boeing 707 entered airline service.

The first Boeing 707 of Air India International, Annapurna, had arrived Bombay on February 21, 1960 within a year and a half of the revolutionary jetliner's entry in airline service with Pan Am on October 26, 1958. With the acquisition of Boeing 707 long-range jetliners, Air India International decided to extend its London service to New York. The 707 was introduced on India-UK route on April 19, 1960, while the New York service was inaugurated on May 14, 1960.

Air India's Boeing 707 being ceremoniously escorted by Gnats

On April 18, 1971, when the first Boeing 747 jumbo of Air India, Emperor Ashoka, landed at Bombay International Airport, Tata stated, while being interviewed by the author of this book on behalf of All India Radio, "I have a feeling of pride and happiness at Air India having come such a long way since it started international operations 23 years ago with a Lockheed Constellation aircraft which weighed 107,000 lb, carried less than 50 passengers, cruised at 250 miles an hour, and cost Rs.4,000,000. In comparison, the 747 weighs 775,000 lb, carries 350 passengers, cruises at 600 miles per hour and costs Rs.190,000,000=00 apiece.

During the twenty-five years of operation after nationalization, from 1953-54 to 1977-78 (the JRD period), Air India's overall financial results showed a net surplus of Rs.641.60 million. The airline, during this period, contributed Rs.331.10 million to the Public Exchequer as payment of dividend and interest on loan. Furthermore, the airline also paid Rs.396.30 million in payment of sales tax, import duty, etc. Thus, against the total investment up to 1977-78 by the Government of Rs.334.10 million in equity and Rs.334.10 million as a long-term loan – the total investment of Rs.668.20 million by the Government and it had contributed Rs.617 million (excluding sales tax) to the public exchequer since 1953-54. Air India's net worth, as of March 31, 1978, was over Rs.1,580 million. This remarkable performance has been possible because of noteworthy management of the airline's resources, and the manpower at its disposal, that led to a better - than - average increase in the productivity of Air-India and optimum utilization of the same. Air-India reported its highest profits of Rs.63.5 million in 1975-76, Rs.176 million in 1976-77 and Rs.250 million in 1977-78.

As he retired from Air-India in February 1978, JRD left behind him in his airline a number of well-experienced, efficient and dedicated persons to carry on with the continuous development of Air India. At the helm of the airline was K.G. Appusamy who joined the airline 29 years ago, at the age of 27, as a senior maintenance engineer and had come up the ladder steadily from the lower rungs to become the first employee of AI to take up the responsibility of running the airline as its Managing Director on July 20, 1977. Tata handed over his chairmanship of AirIndia to Air Chief Marshal P.C. Lal (Retd.), who became the first joint chairman of AirIndia and Indian Airlines. As the head of many committees, and member of many others, Tata's contribution in the field of civil aviation in India in particular, and the world

in general, has also been great. The Tata Committee studied in detail various aspects concerning the development of the four international airports, taking into consideration the basic criteria and requirements, such as terminal buildings, runways, taxiways, and, last but not the least, the management of the airports.

Furthermore, it was intended that these airports should be, as far as possible, self-supporting financially, and this also required a commercial approach which could best be provided by an independent authority. Dr Karan Singh, then minister responsible for civil aviation, indicated in the Lok Sabha that he too favored an autonomous organization for the management of the four international airports as recommended by the Tata Committee and thus came the formation of the International Airports Authority of India (IAAI) in April 1972, with a goal to offer adequate facilities at, and efficient running of the four major international airports in India, for easier handling of the fast-growing airline traffic, mainly based on the Tata Committee's recommendations.

In October 1949, Tata attended the Annual General Meeting of IATA held at the Hague for the first time and with that began a long and fruitful association of the Indian flag carrier with this important world body. Tata strongly emphasized at the Hague meeting of IATA in 1949 that in view of the great distance between India and the main traffic generating areas in developed nations, special consideration should be given by the Association when fixing fares to and from India.

At this meeting, S.K. Kooka, then Traffic Manager of the fledgling, one-year old international carrier of India – the "Creator of Maharaja", the symbol of top-quality service of Air India – was elected to the IATA Traffic Conference. In September 1957, Tata was elected President of the IATA at its AGM at Madrid for the year 1958-59 and assumed office at the AGM of the Association held at New Delhi, October 27-31, 1958: this was the first time that an AGM of the IATA was held in the Asian continent.

In 1958, out of the total of ten Asian IATA-member airlines, the national carriers of India, Air-India and Indian Airlines, carried 696,399 passengers or 28% of the total (2,479,159) carried by all the Asian IATA-member carriers - how dismal the share is today. In aviation, he was called into consultation in matters of Government administration and organization, and the Government showed its faith in appointing him Chairman of several committees of inquiry into such matters.

Jehangir Ratanji Dadabhoy Tata, who was popularly known as JRD, and as Jeh to those who were known to him intimately, was born on July 29, 1904 in Paris. He had his first taste of flying at the age of 15, in a post-world war I aircraft flown from a French seaside resort by a barnstorming pilot-adventurer. "From then on, I dreamed of nothing but learning to fly." It was ten years later, in 1929, that JRD got his private pilot's license in Bombay. Soon after getting his pilot's license, JRD established the Aviation Department of Tata Sons Ltd, in cooperation with his friend and colleague, Nevil Vintcent, an Englishman. Since he had been the undisputed leader of the air transport industry in India, he was affectionately called the "Father of Indian Aviation." Yet, he was unceremoniously asked by the Government to hand over his chairmanship of Air-India to Air Chief Marshal P.C. Lal, but he was happy that it was Lal who was chosen to succeed him.

Earlier, in 1958, when Tata took over as the President to IATA, the first from Asia, Sir William introduced him at this world assembly of airline leaders as "a very distinguished citizen of the world," his first name Jehangir, meant "world encompasser" and there could be no man more universal than J.R.D. Tata, he stated. Sir William described JRD as "an eminent Indian born in France and educated in those two countries, as well as Japan; he is equally universal in other spheres of life outside aviation, namely, iron & steel, oil, hydroelectric, locomotive, engineering, insurance, chemicals and investment enterprises… "He is also well known for his humanitarian outlook in the matter of labour relations. In the United States, he was elected 'the most outstanding management man of the year' for 'humane leadership of industry in a country where the people need guidance, compassion and appreciation' by the National Association of Foremen of the USA in September 1953." The then DG of IATA also said, "I have known JRD for 30 years and have the greatest admiration for his energy, leadership and idealism."

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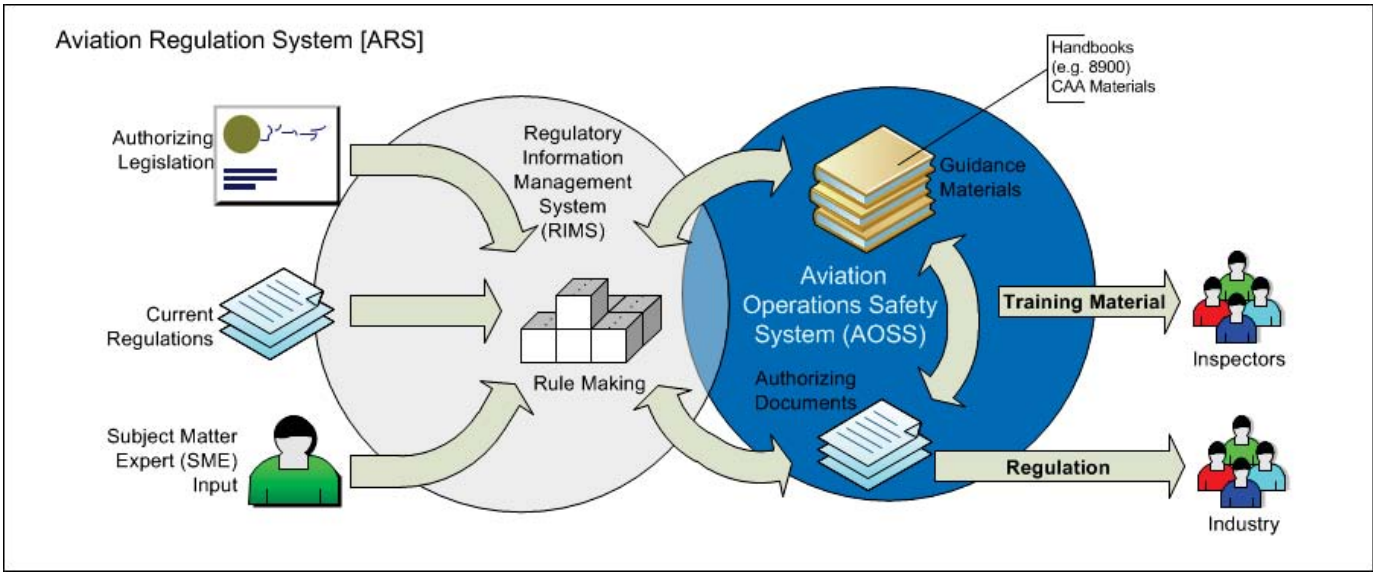

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HOW DO YOU MEASURE A METRON ?

$$\mu_k < M_k - \sigma_k$$
$$M_k - \sigma_k \le \mu_k \le M_k + \sigma_k$$

70 MILLION MINUTES OF **DELAYS ELIMINATED**

+ 191 MILLION LITERS OF **FUEL SAVED**

$$d(v,w) = \sqrt{\sum_{k=1}^{n} \frac{(v_k - w_k)^2}{\sigma_k^2}}$$

= 590 THOUSAND METRIC TONS OF **CO_2 EMISSIONS CUT**

= 7 BILLION DOLLARS OF **COST SAVINGS**

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