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AN EXCLUSIVE MAGAZINE ON CIVIL AVIATION FROM INDIA

- AIRCREW TRAINING
- AUTOMATION COMPLACENCY
- SEMINAR REPORT

EMBRAER ANNOUNCED AT THE NBAA 2011 MOVIE STAR JACKIE CHAN WILL SOON JOIN ITS LEGACY 650 FAMILY OF OPERATORS AND BECOME A BRAND AMBASSADOR OF EMBRAER EXECUTIVE JETS

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EMBRAER AMBASSADOR JACKIE CHAN

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Cover:
Embraer announced at the NBAA 64th Annual Meeting & Convention in Las Vegas, US, that Hollywood star Jackie Chan will soon join its Legacy 650 family of operators and become a brand ambassador of Embraer Executive Jets
Photograph: **Embraer**

SHOW REPORT / NBAA 2011

◁ **P28** **FAIR RECOVERY**

Business aviation is poised for moderate recovery beginning in 2012, stated Honeywell Aerospace's Annual Business Aviation Outlook, released at the NBAA 2011.

AIR TRANSPORT / CARGO

◁ **P11** **STUNTED GROWTH**

As transportation of cargo by air is expected to be speedy and time saving, delays due to inadequate infrastructure are not only irksome but also financially discomforting for the client.

AIR TRANSPORT / REGIONAL AVIATION

◁ **P13** **EMERGING COMPETITORS**

Regional airlines are beginning to exhibit a marked appetite for bigger planes, both jet and turboprop, to reduce per-seat operating costs. The dividing line between narrow-body and regional jets continues to blur.

HELICOPTERS / TECHNOLOGY

△ **P23** **EYE IN THE SKY**

For the first time four Eurocopter choppers were put into action for the live coverage of the Commonwealth Games.

TRAINING / AIRCREW

△ **P20** **IMPROVE TROUBLE-SHOOTING SKILLS**

Pilots require to be trained for high altitude manual flying, leave alone handling emergencies simultaneously.

47

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SP's AIRBUZ
AN EXCLUSIVE MAGAZINE ON CIVIL AVIATION FROM INDIA

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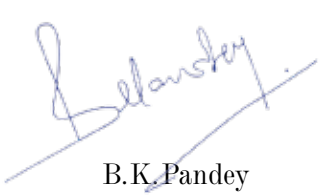
JUST WHEN THE LOW-COST model was consolidating its gains in the airline industry in India and the budget carriers were inching towards profitability, Kingfisher Airlines made public its intention to down shutters on Kingfisher Red, its low-cost arm as it was found to be unsustainable. The move appeared somewhat jarring as prima facie it runs counter to the belief the world over that it is the low-cost model that really has a future. But Kingfisher Airlines, apparently in serious financial difficulty, has its own compulsions for the decision, born out of internal contradictions inherent in the management of two widely diverse operating models under a common brand. On the other hand, the national flag carrier Air India, that has stayed away from the low-cost model so far, has been struggling to get back on the rails under the new management. It is yet to embark on its much touted and long awaited restructuring plan that is likely to call for some hard decisions the airline management may find it difficult if not impossible to take.

In this issue, A.K. Sachdev examines two specific areas in the regime of civil aviation that have suffered prolonged neglect and have been languishing on account of government apathy. These areas pertain to heliports and the air cargo. Tragically, both these are afflicted with inadequacy of infrastructure that are woefully inadequate having been overshadowed by more pressing demands of airport development and rapidly increasing passenger traffic. The situation has begun to change but not rapidly enough to make palpable impact in both the areas. In his treatise on regional aviation, Joseph Noronha examines the trend in the industry that appears to be tilting in favour of larger aircraft, both in the regime of jet and turboprop aircraft. With airports in Tier-II and III joining the network in increasing numbers and the volume of traffic growing, the trend is quite understandable. Noronha also carries out an in depth analysis of the disastrous episode in which Air France 447, which disappeared somewhat mysteriously over the Atlantic two years ago, killing all on board. Analysis of the data obtained from the flight data recorder and the cockpit voice recorder recovered from the depths of the ocean reveals inadequate understanding of the high levels of automation in modern airliners and shortcomings in training systems of the airline. In another related article, Hyderabad-based Dr Mani Sishta, a specialist in aviation medicine, highlights the hazards of automated systems describing it as automation complacency, that lead to degeneration of skills and especially the capability to respond to emergency arising out of failure of single or multiple automated systems.

An event of particular significance for the airline industry has been the induction by India's budget carrier SpiceJet of Bombardier's Q400 turboprop aircraft to compete in regional aviation market so far dominated by the ATR-72. In a three-part article, Bangalore-based Vasuki Prasad carries out an objective appraisal in totality of the two aircraft that are set to make a profound impact on the regional aviation market in India.

These and more in this issue. Welcome aboard and happy landings!



B.K. Pandey
Editor

INFRASTRUCTURE

SECOND AIRPORT FOR CHENNAI

While the International Civil Aviation Organisation (ICAO) in a study carried out earlier had found a proposal to locate the second airport for Chennai at Sriperumbudur as feasible, the Airports Authority of India (AAI) has now projected a requirement to the Government of Tamil Nadu for 5,000 acres of land for the purpose. The project to be handled by the AAI and not under public-private partnership is estimated to cost ₹5,000 crore.

GVK TO ACQUIRE EQUITY IN BIAL

GVK Power and Infrastructure Limited (GVKPIL) has made public its intent to acquire further equity shares in Bangalore International Airport Ltd (BIAL). GVK, India's largest infrastructure developer, has invested over ₹8,500 crore into infrastructure projects and has in the pipeline investments worth over ₹25,000 crore. Bangalore Airport and Infrastructure Developers Private Limited, a subsidiary of the company has exercised its Right right of First first Rrefusal for acquiring 5,38,44,000 equity shares with a face value of ₹10 each held by Siemens Project Ventures Gmbh. This holding constitutes 14 per cent of the issued capital of BIAL and is available at a price of ₹114 per equity share.

MIAL TO HOST GLOBAL AVIATION MEET

Mumbai International Airport Ltd (MIAL) has been selected to host the 11th international aviation meet 'Routes Asia' in 2013. 'Routes' was founded in 1995 as part of the Manchester-based ASM, a consultancy specialising in the field of route development for airports. 'Routes Asia' is attended by representatives from leading airports, airlines and the tourism industry as it offers a forum to explore opportunities for airline route development. "This event is noteworthy, as apart from being one of the busiest airports in South Asia, MIAL has emerged as one of the most significant aviation hubs in the region," said G.V. Sanjay Reddy, MD, MIAL and Vice Chairman of GVK group. The event is expected to enhance the status of MIAL with the completion of the T2 integrated passenger terminal in 2013 and help reinforce MIAL position as the country's foremost airport.

NEW AIRPORT AT ISLAMABAD

As per the Civil Aviation Authority, the new international airport—the first Greenfield airport in Pakistan, located at Attock, 30 km Southwest of Islamabad, is expected to become operational by 2014. The $400 million project is being jointly executed by a Chinese company and Pakistan's Frontier Works Organisation, both racing against time to meet the deadline. The new airport spread over 3,600 acres, will replace the existing, heavily congested Benazir Bhutto International Airport at Chaklala and will serve the twin cities of Islamabad and Rawalpindi as also the adjoining provinces of Punjab and Khyber Pakhtunkhwa. The new airport would be capable of handling 6.5 million passengers and 80,000 tonnes of cargo annually. A significant portion of the land has been earmarked for commercial purposes such as duty-free shops, hotel and convention centre, malls, business centre, food courts, leisure and recreational facilities.

REVIVAL OF NON-OPERATIONAL AIRSTRIPS

With private participation, AAI will revive and upgrade 28 out of the 40 non-operational airstrips for non-scheduled operations. These are located in Rajasthan, Orissa, Bihar, Uttar Pradesh, Jharkhand and the North Eastern Region. "We have a definite plan of reviving the unused airstrip. To begin with, we will put up a temporary structure and further investments will be made depending on the need and commercial viability," said V.P. Agarwal, Chairman, AAI. Thirty-five non-metro airports are already being upgraded by AAI that is exploring options for resources to fund its infrastructure upgrade projects. The authority has not yet received permission from the Finance Ministry to raise resources through tax-free bonds.

INDUSTRY

ORDER FOR AIRBUS BY GARUDA INDONESIA

Flag carrier Garuda Indonesia has placed orders for 25 A320 jets, including 10 A320neo for which a memorandum of understanding has been signed between the two companies. The aircraft will replace the Boeing 737 aircraft fleet currently on the inventory of Garuda's low-cost arm, Citilink. At list prices, the order is worth an estimated $2.18 billion. However, as the order is large, there is a possibility of a substantial discount the quantum of which has not yet been made public. Airbus claims that equipped with better engines, the A320neo offers fuel efficiency that is higher by 15 per cent as compared with the classic model.

B777-300ER FOR SINGAPORE AIRLINES

As part of its plans for expansion, Singapore Airlines has placed orders for eight additional Boeing 777-300ERs valued at $2.3 billion at list prices taking the list of orders to 70 aircraft pending with the two global aerospace giants Airbus and Boeing. Deliveries are expected to begin in 2013. Singapore Airlines already operates a fleet of 19 B777-300 ER. Altogether, the existing fleet consists of 106 wide-body aircraft from Airbus and Boeing, with an average age of six years and four months. Powered by General Electric GE90 engines, the new aircraft will come with a three-class layout and will be operated on medium- and long-haul routes. The order is in conformity with the policy of the airline to keep the fleet young and modern.

LARGE ORDERS BY CATHAY PACIFIC

Cathay Pacific has ordered four more Boeing 777-300ER aircraft as well as eight Boeing 777F freighters. The aircraft are scheduled to be delivered between 2013 and 2016 and both variants will be powered by the GE-90 engines. Cathay Pacific currently operates 22 Boeing 777-300ER and will have a total 64 after delivery against this order is completed. The Boeing 777-300ER aircraft are to replace the current fleet of Boeing 747-400 and Airbus A340-300. Cathay Pacific's total order book for passenger aircraft has now risen to 93, which includes 42 777-300ER, 32 Airbus A350-900 and 19 Airbus A330-300. Cathay Pacific has not yet placed orders for

EVENTS CALENDAR

SEOUL INTERNATIONAL AEROSPACE & DEFENSE EXPO
18-23 October
Incheon International Airport, Seoul, Korea
www.seoulairshow.com

FUTURE MRO & AGEING AIRCRAFT
26-27 October
Holiday Inn Bloomsbury, London, UK
www.smi-online.co.uk/events/overview.asp?is=1&ref=3807

INTERNATIONAL AIR SAFETY SEMINAR
1-3 November
Mandarin Orchard, Singapore
www.flightsafety.org

FUTURE OF BUSINESS JETS
2-3 November
Thistle Hotel Marble Arch, London, UK
www.quaynote.com

CIAM INTERNATIONAL AVIATION TRADE SHOW & CONGRESS
12-14 November
Moon Palace Golf & Spa Resort, Cancun, Mexico
www.expo-ciam.com

DUBAI AIRSHOW 2011
13-17 November
Airport Expo, Dubai, UAE
www.dubaiairshow.aero

CEPA EXPO 2011
1-2 December
Prague Congress Centre, Prague
www.cepaexpo.com

the Boeing 787 and may use the 777-300ER as insurance against delay in the delivery of A350. There is also the need to replace the fleet of Boeing 747 and A340. Cathay Pacific currently operates 21 747-400 and 11 A340-300. The airline perceives clear benefit in replacing old airplanes with more fuel efficient 777-300ER to subdue the impact of rise in fuel prices.

BOEING'S MARKET FORECAST

Boeing predicts that over the next 20 years, North American air carriers will need around 7,530 fuel-efficient single-aisle airplanes valued at $760 billion. According to the global aerospace major, demand in the US and Canada will focus primarily on single-aisle jetliners, driven by the need to replace ageing airplanes with new, more fuel-efficient ones. Boeing forecasts that by 2030, single-aisle airplanes will constitute 73 per cent of the total North America fleet. A majority of this increased growth in the single-aisle category is related to traffic to and from economically dynamic regions in Central and South America. New single-aisle airplanes, such as the 737 Next Generation and the recently launched 737 MAX, offer significant advantages in improved capabilities, fuel efficiency and maintenance costs as well as enhanced environmental performance. Long-haul international traffic will continue to grow at an average annual rate of about 4.5 per cent. This growth is expected to result in demand for an additional 1,180 new fuel-efficient, twin-aisle airplanes. Large airplanes such as the B747 will not witness significant demand in North America.

ORDERS FOR BOEING BY AIR LEASE CORPORATION

Los Angeles-based aircraft leasing company Air Lease Corporation has confirmed placing an order for 19 aircraft from Boeing for $2.5 billion at list prices. The order is a part of the broader agreement between the two companies signed during the Paris Air Show in June this year, which was for 33 aircraft consisting of 24 B737-800 Next-Generation, five B777-300ER and four B787 Dreamliners. The current order is for 14 B737-800 Next-Generation with options for four and five B777-300ER. With this, the backlog of orders by Air Lease Corporation went up to 60 B737-800 Next-Generation aircraft.

REGIONAL JETS FOR CHINA

Embraer's forecast for the Chinese regional aviation market for the period 2011 to 2030 indicates that it is emerging as one of the fastest growing markets. The company sees a demand for 975 regional jets in this period, accounting for 13 per cent of global market. The breakdown of requirement of airliners is assessed as15 of 30-60 seats, 440 of 61-90 seats and 520 of 91-120 seats. In the first half of 2011, Embraer got China Southern Airlines and Hebei Airlines as new customers. Since the first purchase in 2000, Embraer has delivered around 90 commercial jets to the region, representing over 70 per cent of aircraft up to 120 seats in the Chinese market.

THAI AIRWAYS ORDERS BOEING 777-300ER

Thai Airways International has placed orders for six Boeing 777-300ER airplanes, a deal valued at approximately $1.7 billion at list prices. The order is under the memorandum of understanding (MoU) signed between Boeing and Thai during the Paris Air Show in June this year for the purchase of B777-300ER airplanes. The two companies are also expected to finalise an order for the lease of eight B787 Dreamliners. Thai has a fleet of around 90 aircraft predominantly from Boeing including the B777-200, B777-200ER, B777-300 and B777-300ER. As per Piyasvasti Amranand, President, Thai Airways, "The 777-300ER sets the standard for twin-aisle reliability because Boeing continuously incorporates new technology and innovations into the airplane to improve operating cost and airplane performance. With a wider and more spacious cabin, the Boeing 777-300ER is preferred by passengers in every class."

QANTAS ORDER FOR AIRBUS

Qantas has announced the biggest aircraft order in the history of Australian aviation by way of a deal for 110 A320 series aircraft worth $9 billion at list prices. The order includes 78 A320neo planes and 32 of the existing version of the aircraft. Latest forecast by Airbus for aircraft orders in the Asia-Pacific Region pegs the requirement at 736 new 100-seat plus passenger planes

and freighters valued at $98 billion over the next two decades. The Qantas order also confirms the A320neo as the world's fastest-selling aircraft model with OEM accumulating 1,250 firm orders and options from 22 customers from around the world. Orders for the fuel-efficient Airbus A320neo soar as airlines seek to cut costs and comply with tougher environmental regulations around the world. The extended range A320neo offers 15 per cent reduction in fuel consumption and higher payload. Fuel efficiency is achieved through a combination of winglets, which Airbus calls Sharklets and new engines from CFM and Pratt & Whitney.

✈ AIR CARGO

CATHAY PACIFIC

Cathay Pacific is the world's largest airline by international cargo carried and is investing about $700 million in a new cargo terminal at Hong Kong International Airport, which is expected to be functional in 2013. The Airline currently operates 21 Boeing 747-400 freighters including the 747-400 Boeing Converted Freighter (BCF). The long-term fleet plan calls for around 35 freighter aircraft (17 Boeing 747-400 freighters, ten 747-8 freighters, and eight 777-200 freighters). The eight Boeing 777F are in addition to a previous order for ten Boeing 747-8F freighters whose delivery is expected to commence this year. These aircraft will provide a fuel-efficient alternative to the heavier 747-400F and are expected to be deployed on dense Asian and European routes. Cathay Pacific has indicated that the B747-8F freighters will be used almost exclusively on routes between Hong Kong and North America.

✈ MRO

BOMBARDIER REGIONAL SUPPORT OFFICE IN BRAZIL

Bombardier Aerospace has announced that by end 2011, it will be commissioning its first Regional Support Office (RSO) in Sao Paulo, Brazil for its business aircraft customers. "With this new RSO, we will be able to resolve customer issues more quickly, mitigate risks before they become issues and further improve support to our growing customer base in the region," said Andy Nureddin, Vice President, Customer Services and Support, Bombardier Business Aircraft.

Bombardier's business aircraft fleet in Latin America consists of more than 475 Learjet, Challenger and Global aircraft, 180 of which are in South America, with a significant proportion based in Brazil. "The support needs of the Latin American market are evolving as business aviation is experiencing sustained growth in the region," said Fabio Rebello, Regional Vice President, Sales, Latin America, Bombardier Business Aircraft. "This new RSO is a timely and critically important addition to the overall support structure for our current and future customers in Latin America." Bombardier's RSO network for business and commercial aircraft includes locations in Mumbai, Tokyo, Sydney, Dubai, Shanghai, and Munich. Bombardier Customer Services is a leader in aftermarket service and support for Bombardier aircraft and has consistently raised the bar to support its growing customer base.

✈ BUSINESS & GENERAL AVIATION

BUSINESS JETS FROM BOMBARDIER

Bombardier Aerospace has announced that interior completion of its new Global 7000 and Global 8000 business jets is to take place at its Global Completion Centre in Montreal. "Global aircraft offer the industry's largest cabins combined with advanced avionics, entertainment systems and office in the sky cabin technology" said Steve Ridolfi, President, Bombardier Business Aircraft. "I am confident in our team's ability to complete the new Global 7000 and Global 8000 jets with the same superior level of quality and pride that goes into every Global 5000 and Global 6000 jets." Featuring a spacious four-zone cabin, the Global 7000 sets the benchmark for a new category of large business jets offering 20 per cent more space than the Global 6000 aircraft, the current industry leader. Expected to enter service in 2016, the aircraft will have a high-

APPOINTMENTS

EMBRAER

Abhishek Sinha and Christophe Chicandard have joined as Sales Directors of Embraer's executive jets in Asia Pacific. Robert Knebel is the Vice-President, Executive Aircraft Sales for US, Canada and the Caribbean and Robert Stangarone is the Vice President, Corporate Communications for North America.

BOMBARDIER

Bombardier has appointed Stan Younger as leader of Aircraft Service Centre Network. Frank Gehry is the Global aircraft brand ambassador and will represent Bombardier Business Aircraft's flagship brand. John Travolta is the brand ambassador for Learjet, Challenger and Global business jets.

CFM INTERNATIONAL

CFM has appointed Cédric Goubet as Executive Vice President.

BOEING

Larry Kellner has been elected as Member, Board of Directors of Boeing. Donna Hrinak is now President of Boeing Brazil.

GULFSTREAM

Gulfstream has named Jace Stone as Director, Product Support Sales for Western US and Western Canada. Scott Nea has been appointed Senior Vice President, Marketing & Sales, Gulfstream. Veteran employees Darrell Frey, James Kelley and Jeff Kilgore have been promoted as Directors, Savannah Service Center Operations.

HAWKER BEECHCRAFT

Hawker has appointed Bill Minkoff as Regional Sales Director for the lower Northeastern United States. Karin-Joyce "KJ" Tjon is the new Chief Financial Officer.

OMAN AIR

Oman Air has appointed Captain Ali Hassan Sulaiman as Deputy Chief Officer, Flight Operations.

TURBOMECA

David Thibes has been appointed General Manager of Turbomeca Canada,; Guy Bonaud as Representative Director of Turbomeca Japan.; and Frédéric Fourciangue as CEO, Turbomeca UK.

FINMECCANICA

Finmeccanica has appointed Maurizio Manfellotto as CEO of AnsaldoBreda and has announced that Sergio De Luca will join the Board of Directors of the company.

speed cruise of M0.90 and a range of 13,520 km at M0.85. Flying farther than any other business jet, the Global 8000 aircraft will feature a superior three-zone cabin.

MAHINDRA LAUNCHES ITS FIRST AIRCRAFT

The NM5, a five-seat, all-metal, single-engine aircraft described as a "Utility Vehicle', successfully completed its maiden flight on September 21, 2011. The aircraft has been developed in a public-private partnership between National Aerospace Laboratories (NAL) and Mahindra Aerospace with Gipps Aero, Australia, a subsidiary of Mahindra Aerospace. The NM5 is India's first indigenous civilian aircraft developed by a private entity and is expected to cost between $3,50,000 and $4,00,000. Commercial production of the aircraft is to start at its facility in Bangalore expected to be ready by June 2012.

TATA'S PLANS FOR GENERAL AVIATION

With its earlier attempts to enter the commercial airlines business having been abortive, the Tata Group is understood to be planning foray in the general aviation sector in collaboration with international players in the regime of business jets, helicopters as well as aircraft management and maintenance services. As per reports, the Group may be in talks with Florida-based Avantair to establish a partnership in India based on the 'fractional ownership' business model. Tata Group already has investment in Singapore-based B-Jets, a company operating on the fractional ownership model. The Group is also set to launch a joint venture with Hong Kong-based Metrojet for aircraft maintenance services for business aircraft. In 2010, Tata Sons made an entry into the aircraft manufacturing segment with the acquisition of stake in Italy's Piaggio Aero Industries, manufacturer of the Avanti II twin-engine turboprop.

✈ REGULATORY AFFAIRS

BILATERAL AIR SERVICE PACTS

Meeting of the International Civil Aviation Organisation (ICAO) in Mumbai scheduled for October 17-22, the first to be hosted by India and to be attended by 60 nations, could result in India abandoning self-imposed moratorium since 2010 on bilateral agreements in the aviation sector. Around 40 countries are lining up to negotiate bilateral agreements with India. Apart from renewal of existing agreements, India will use the opportunity to modernise air service agreements in the backdrop of changing environment by including safety clauses, code-sharing guidelines, security and tariff.

EU AIRLINE TAX

European Union's plans to impose a tax on the aviation sector has run into rough weather with a group of 25 countries, including India, the US, China, Japan and Russia, jointly condemning the plan as unacceptable. Under the planned Emission Trading Scheme (ETS), beginning January 2012, airlines using EU airspace will have to pay a fee for carbon emissions that exceed a defined cap and the levy will be passed on to passengers. India recently hosted the two-day meeting of aviation representatives in Delhi that ended with a joint declaration expressing their views. On behalf of the countries that met in Delhi, the Indian Government will send a démarche to the EU with a copy of the joint declaration, said Civil Aviation Secretary Nasim Zaidi. "It is inconsistent with the international legal regime," he added. ETS measures violate the Chicago Convention governing international aviation as well as World Trade Organisation norms. Russia will host the next meeting of the 25 countries in November.

AIR SERVICE CHARGES

To prevent passengers from being exploited by airlines especially during periods of high demand, India's aviation regulator will issue guidelines on transparency in respect of fare structures, refund timelines, bar on charges for use of wheelchairs, seat preference or for unaccompanied minors. "The intention is to check airfare prices from going up extraordinarily," said Bharat Bhushan, the Director General of Civil Aviation (DGCA). Carriers will need to indicate the components of fares, including fuel surcharge, airport tax, service tax and insurance. Airfares will also need to be rationalised with distances travelled so that two destinations equidistant from a hub are not charged differently.

As for refunds, airlines will have to ensure that the passengers are reimbursed within one week. Currently, some airlines carry forward the refund due to be adjusted in the next booking within one year. Hike in fares will have to be rationalised against a rise in operating costs and can no longer be arbitrary. According to the DGCA, maximum and minimum fares cannot be changed significantly unless there is a pronounced change in the external operating environment. In case reasons exist for such a change, airlines will have to intimate DGCA within 24 hours.

✈ AIRLINE FINANCE

BUSINESS MODEL: JET AIRWAYS

Jet Airways is considering a change in its business model and offer increased low-cost services. The company operates the full-service Jet Airways and has two low-cost services in Jet Konnect and Jet Lite. The Airline reported a loss of ₹123.16 crore for the quarter ending June in the current fiscal as against a profit of ₹3.52 crore for the same period a year ago. "With growth primarily from the low-fare segment in the domestic sector, we are undertaking a review of the business model and will soon make changes to retain our dominant position in the Indian market," said Naresh Goyal, Chairman, Jet Airways.

ECONOMIC TURNAROUND IN AIR INDIA

In an interview with a national daily, the recently appointed Chairman and Managing Director of Air India, Rohit Nandan, stated that his foremost priority would be to ensure timely implementation of the airline's restructuring plan. He would simultaneously focus on greater market share and better customer service. He also mentioned that the restructuring plan was being finalised by a Group of Ministers (GoM). Talking about the carrier's economic turnaround, he said that apart from implementing the restructuring plan in a definite time frame, he would secure the required finances from the government as also generate operating profits. He felt it was important that the airline revitalised customer experience and with changing times, the carrier needed "to respond to new needs of a youthful India. Young fliers should choose to fly Air India and feel satisfied with the service. SP

PHOTOGRAPH: Nasa

ULTRA PROFICIENT

Taurus G4 was able to fly 320 kilometres in less than two hours

PENNSYLVANIA-BASED PIPISTREL-USA HAS WON the National Aeronautics and Space Administration (NASA) comparative aircraft flight efficiency (CAFÉ) Green Flight Challenge after taking the first place with their electric plane called the Taurus G4 that was able to fly 320 kilometres in less than two hours. The contest, sponsored by Google, was created in order to spur the development of electric airplanes and efficient aircraft designs. The prize money was $1.35 million (₹6.08 crore).

The CAFÉ challenge was created to push aircraft engineers towards new, more efficient airplane designs that would usher in a new era of ultra-efficient flight, based on either electric engines or extremely efficient fuel-burning engines. According to NASA, 14 teams registered for the competition but only three were able to meet the contest's requirements and the first and second place were occupied by electric airplanes.

The teams were asked to average 160 kilometres per hour over two hours, and to do so on the equivalent of one gallon of gas. Not only did Pipistrel manage this, but so did California-based e-Genius with its electric-powered plane (for which it netted a second place prize of $1,20,000–₹54 lakh). Both the teams did so on just a little more than a half-gallon of fuel equivalent. They did twice as much as NASA and CAFE asked them to do but Pipistrel was slightly better than e-Genius. SP

For more information and video, visit:
www.spsairbuz.net

ZERO-EMISSION JET

Eurocopter innovation puts the focus on safety with the world's first flight of a hybrid helicopter combining an internal combustion engine and an electric motor

PHOTOGRAPH: Eurocopter

EUROCOPTER HAS SUCCESSFULLY TESTED a hybrid helicopter that combines a turboshaft internal combustion engine with an electric motor for a world premiere, marking a new milestone in its innovation roadmap that opens the way for further enhancements in rotary-wing aircraft safety.

For this initial breakthrough in exploring the hybrid concept, Eurocopter is using the supplemental electric system to increase manoeuvrability of a single-engine helicopter during an autorotation landing – which is performed by helicopters in the event of a main engine failure.

The demonstrator helicopter is a production version of Eurocopter's highly successful light single-engine AS350, which has been equipped with a supplementary electric motor. In the event of an engine failure, the electric motor provides power to the rotor, allowing a pilot to control the helicopter very easily during the descent to a safe touchdown. The next step is to bring this concept to maturity and evaluate its implementation on Eurocopter's series production helicopters.

"Eurocopter's research and development efforts are used every day to push the frontiers by increasing helicopter safety and performance for the benefit of our customers, and we are proud to have brought the first helicopter equipped with an internal combustion engine and electric propulsion system to flight," said Lutz Bertling, Eurocopter President and CEO. "Hybrid propulsion is an important element of Eurocopter's innovation roadmap in developing the next generation of helicopters. It offers new opportunities for improvements in safety, along with the potential for reducing fuel consumption and emissions."

The AS350 hybrid demonstrator has its highly compact electric motor and lithium ion polymer battery installed in the centre area of the helicopter. Electronic controls enable precise deployment of power delivered by the electric motor during the period of autorotation.

Eurocopter's AS350 is one of the most successful helicopters, with the more than 4,000 aircraft in service worldwide having logged more than a million flight hours as of 2010. It excels in hot conditions and very high altitudes, holding the record as the only helicopter to have landed on top of Mount Everest. SP

Blue Dart Aviation is the only scheduled cargo airline to successfully operate and flourish in India

Air India's plans to reconfigure for cargo operations with some of its 40-odd aircraft lying idle, have not taken off

STUNTED GROWTH

As transportation of cargo by air is expected to be speedy and time saving, delays due to inadequate infrastructure are not only irksome but also financially discomforting for the client. The general consensus is that Indian aviation infrastructure is ill-equipped to handle the efflux of goods that traverse through its airports.

BY **A.K. SACHDEV**

UNDOUBTEDLY, INDIA IS NOT only the leading economy in South Asia but also the international trade hub in the region. Approximately two-thirds of the international traffic that moves in and out of the region passes through India. Facilitated by its strategic location between South East Asia and Europe, the Indian economy is on a growth trajectory and the policy on liberalisation of the aviation sector presents an opportunity to propel India into a global cargo hub. Yet despite all the favourable economic indicators, the Indian air cargo industry remains stunted.

A few years ago, the decision to raise the foreign direct investment (FDI) cap from 49 to 74 per cent in the air cargo sector generated considerable interest amongst airlines in India, notably Air India, Jet Airways and Kingfisher as also amongst international players FedEx, Malaysia Airlines and Australia-based HeavyLift Cargo Airlines. Despite the opportunity, Indian cargo carriers, with the exception of Blue Dart, have proved to be short-lived primarily on account of infrastructural inadequacies and internal issues.

International cargo traffic into, out of, and through India, is concentrated at three major international freight gateways—airports at Mumbai, Delhi and Chennai. With the development of infrastructure at the Greenfield airports like Bengaluru and Hyderabad and with the planned air cargo hub at Nagpur, higher cargo traffic is expected from these airports as well. Although international air cargo traffic is much higher than domestic traffic, the latter offers greater potential for Indian investors since regulations prevent foreign airlines from competing in the domestic sector. This is the segment to watch for growth, given the increase in the number of Tier-II cities and the need to connect these with the hubs. However, infrastructural woes are aplenty, discouraging air cargo operations in India.

IMPEDIMENTS TO GROWTH OF AIR CARGO. In April this year, cargo movement in and out of Delhi Airport suffered delays by as many as 10 to 12 days due to construction and renovation work by ground handler Celebi and Delhi International Airport. The Federation of Indian Exporter Organisations (FIEO) termed the disruptions as "image denting" and called upon the government to step in. FIEO Vice-President and Regional Chairman J.K. Jain said that the exporters were facing heat from their customers who had the impression that there was "always something wrong with India's systems". As transportation of cargo by air is expected to be speedy and time saving, delays due to inadequate infrastructure are not only irksome but also financially discomforting for the client. Sadly, the general consensus is that Indian aviation infrastructure is ill-equipped to handle the efflux of goods that traverse through its airports. According to Bernard Asare, Director, Air Traffic Management Strategy and Business Development, ITT Corporation, "Air traffic congestion in India and globally is the result of outdated technologies and operational procedures not keeping up with rapidly changing aviation

PHOTOGRAPHS: Wikipedia, wordpress.com & SP Guide Pubns

Deccan 360 banked on the wrong aircraft (A310), turning to ATRs mid-course but failed to survive

industry dynamics." Air traffic continues to grow while air traffic management systems employ archaic technologies leading to undesirable congestion in India's airspace and airports. While air traffic growth is manifest in other parts of the world as well, the problem in India is more pronounced because of lack of the capacity to handle the massive growth in traffic.

Minor irritants exist at all stages of cargo operations. As an illustration, at the Indian airports, all vehicles on the airside need to have speed governors to restrict the speed to 30 kmph. Patently flawed, the regulation not only imposes wasteful strain on vehicles but also reduces their useful life, increases fuel consumption and is unsafe as the vehicle would not be able to provide swift response in an emergency. From the point of view of air cargo operations, if there was no such restriction, a freight vehicle without speed governor could have carried cargo from a warehouse directly to the aircraft. Currently, freight is required to be transferred from a non-governor vehicle picking up cargo from the warehouse to a governor-equipped vehicle before entering the airside. Wastage of time in transfer of freight and the security inspections thereafter are avoidable if the vehicle loading up freight at the warehouse after due security diligence could be sealed and send directly to the aircraft with a security escort.

While on the subject of security, we may recall the foiled bombing plot in October 2010 which highlighted the chinks in the cargo security armour. Consequently, the need to secure international cargo took centre stage in the ongoing national security debate. Hundred per cent screening of all international cargo is now an inescapable necessity and with Indian sensitivity to the terrorist situation, security clearance of cargo is time consuming to say the least. Besides, customs officials at airports run their own regimes and while regulations are fairly well formulated, practices on the ground leave a lot to be desired. Frequent closures due to strikes and public holidays, inordinate delays due to personal whims and fancies of duty personnel and avaricious tendencies pervading the departmental culture, are major hurdles to the smooth and efficacious flow of goods through airports. Apart from the hindrance to smooth flow of cargo by customs, red-tapism is visible at every step with no transparency and accountability. Inevitably, agents become lubricating mechanisms at cargo terminals.

INDIA'S RELUCTANCE TO EMBRACE E-FREIGHT PROBABLY ARISES FROM THE DISTRUSTFUL NATURE IN OUR NATIONAL CULTURE

E-FREIGHT. Another hindrance to smooth flow of cargo is Indian resistance to e-freight. The International Air Transport Association (IATA) initiative aims to take the paper out of air cargo supply chain and replace it with cheaper, more accurate and more reliable electronic messaging. Each air cargo shipment carries with it as many as 30 paper documents. E-freight aims at involving carriers, freight forwarders, ground-handlers, shippers, customs authorities and includes a set of business processes and standards that allow the removal of documents from the process of shipping air cargo from its origin to its final destination. Indian's reluctance to embrace e-freight probably arises from the distrustful nature in our national culture and constitutes a major challenge to the air cargo industry in India.

INTERNAL ISSUES. As of now, Blue Dart Aviation is the only scheduled cargo airline to successfully operate and flourish in India. Its reputation in the market is high and the airline has a large clientele and practically no competition. Cargo airlines such as Elbee, Crescent Air Cargo, Aryan Cargo Express, Flyington Freighters, Quikjet, Deccan 360 and First Flight rose and fell by the wayside due to a variety of reasons including serious flaws in their business models or strategy. Aryan failed to make enough revenue to survive, Flyington got into a dispute with Boeing even before the first aircraft was delivered, Quikjet suffered at the hands of inadequately experienced executive management that refused to accept sound operational in-house advice and First Flight was strangulated by the loss of one of its three aircraft. Deccan 360 banked on the wrong aircraft (A310), turning to ATRs mid-course but failed to survive.

Air India's air cargo business has taken a nosedive as the cargo aircraft they operate are too big for domestic operations and too small for international routes. Air India's plans to reconfigure for cargo operations with some of its 40-odd aircraft lying idle, have not taken off. Giving a push to the air cargo business of the national carrier is a part of the turnaround plan to slash the huge cumulative losses. Airlines operating on domestic routes with passengers carry some belly cargo under arrangements with cargo companies. However, the total cargo capacity in the domestic sector has the potential to grow provided there are appropriate changes in regulations and support infrastructure.

NAGPUR AS AN AIR CARGO HUB. Plans to develop Nagpur as an air cargo hub through large-scale investments in a Multi-modal International Hub and Airport (MIHAN) project have been delayed as firms backed out of the proposed special economic zone (SEZ) following the global economic slowdown in 2008. Initial plans were to expand the existing runway at Nagpur and add a second runway. Fruition of these plans would take time but once ready, Nagpur may well make a substantial difference to the future prospects of the Indian air cargo industry. Over the recent years, air freight traffic growth has been significantly higher than the GDP growth rate. It remains to be seen whether this trend is sustained by improvements in the general conditions supporting air cargo operations. SP

EMERGING COMPETITORS

Regional airlines are beginning to exhibit a marked appetite for bigger planes, both jet and turboprop, to reduce per-seat operating costs. The dividing line between narrow-body and regional jets continues to blur.

E195 with a capacity of 108- to 122-seat is the latest and largest in Embraer E-Jet family

BY **JOSEPH NORONHA**

ONCE UPON A TIME, regional jets were an undersized 30- to 50-seat affair, predominantly frequenting short-haul routes. Their role was to ferry small groups of passengers from remote airports to major hubs from where larger airliners operated to distant destinations. Regional jets gradually grew in size and an upper limit of 99 seats came to be accepted. Strangely enough, there has never been a wildly successful commercial jet in the range of 100- to 149-seat. Until now, that is.

Regional airlines are beginning to exhibit a marked appetite for bigger planes, both jet and turboprop, to reduce per-seat operating costs. And a handful of manufacturers are striving to produce such aircraft. This will, in a sense, give them the best of both worlds. While they hope to trump the current regional jet champions who only offer smaller aircraft, they could soon be snapping at the heels of the big two, Airbus and Boeing, who have a virtual duopoly for narrow-body jets of 150 seats and above. The Airbus A320 and Boeing B737 account for about half of all commercial jets today. And the dividing line between narrow-body and regional jets continues to blur.

In June, Embraer raised its global forecast for regional jets to 7,225 in the 30- to120-seat segment over the next 20 years. Meanwhile, Bombardier is even more confident that there will be demand for new, larger, more fuel-efficient jets, and sees a need for 13,000 aircraft in the under 149-seat market over the same period. No doubt, Bombardier and Embraer rank third and fourth in global commercial aircraft sales respectively and hope that Boeing and Airbus will steer clear of the below150-seat market, allowing them to continue to dominate this segment. But they face emerging competition from Russia, China and Japan pursuing regional-jet programmes of a capacity of up to 70- to 100-seats and above.

PHOTOGRAPHS: Embraer, MRJ & Bombardier

The Russian Sukhoi Superjet SSJ100-95 that entered service earlier this year, is a modern, fly-by-wire, regional twin-jet capable of carrying 75 to 98 passengers up to a range of 4,400 kilometres. It may eventually get a larger variant with up to 130 seats, but not before it loses some weight. While ARJ21 from China's Commercial Aircraft Corporation (Comac), is expected to enter service in 2012, Japan's Mitsubishi Regional Jet (MRJ) deliveries are expected to begin in the first quarter of 2014. Embraer is also committed to announcing its next aircraft development programme most likely in the 120-200 seat range, by the end of the year. And Bombardier could finally prevail with its futuristic CSeries siblings that are expected to enter service by 2013. Isn't the market crowded?

THE CHINESE CHECK-IN. Claimed to be the first Chinese indigenous passenger jet, the twin-engine ARJ21 is being built on tooling from McDonnell Douglas for licence production of the MD-90. The ambitious programme is supported by aerospace majors like General Electric, Honeywell and Rockwell Collins. China expects to commission several new airports in smaller cities over the next decade or two thus expanding the demand for regional jets. With a range of 3,700 km, the aircraft is designed to cope with diverse and demanding environments, including the hot-and-high conditions of Western China. Fitted with General Electric CF34-10A engines (17,057 lb thrust) it has powerful take-off and climb performance that facilitates operation from short runways. While the ARJ21-700 baseline model will have a capacity of 78- to 90-seats, the stretched ARJ21-900 will carry 98 to 105 passengers. Comac has secured 206 orders till date, mainly from the domestic market. However, the ARJ21 has been plagued by delays stretching to over four years. Launch customer Chengdu Airlines is expected to receive its first ARJ21-700 aircraft next year.

MITSUBISHI MAGIC. Manufactured by Mitsubishi Aircraft Corporation, a partnership between Mitsubishi Heavy Industries and Toyota Motor Corporation, the Mitsubishi Regional Jet (MRJ) will be the first indigenous airliner of Japanese design and production since 1960. Four versions including two freighters are planned using different fuselage lengths. The aircraft was initially claimed to be the first regional jet to adopt composites on a significant scale. However, Mitsubishi later decided to use aluminium for its wing box so as to allow a shorter lead-time for structural changes. The company believes this will maximise the performance of all MRJ. Composites now comprise just 10 to 15 per cent of the aircraft. The twin-jet MRJ70 will be fitted with Pratt & Whitney's new fuel-efficient PW1217G Geared Turbofan (GTF) engines with 15,600 lb thrust, while its larger sibling, the MRJ 90, will have the same engines rated at 17,600 lb.

The 86- to 96-seat MRJ90 is expected to enter airline service in the first quarter of 2014, with the 70- to 80-seat MRJ70 following perhaps a year later. The official launch of the proposed 100-seat MRJ100X stretched version may have to wait until after the first flight of the MRJ90 expected middle of next year. Still lacking a customer, the larger aircraft is unlikely to reach the market before 2016 or 2017. Mitsubishi Aircraft has received 130 orders so far, including 15 MRJ90s from its launch customer All Nippon Airways. But it needs to produce at least 350 to 400 units to recoup the development costs.

THERE ARE MARKETS GLOBALLY STILL UNTOUCHED BY THE REGIONAL JET REVOLUTION

The twin-jet MRJ70 will be fitted with Pratt & Whitney's new fuel-efficient PW1217G Geared Turbofan (GTF) engines with 15,600 lb thrust

BOOSTING BOMBARDIER. The CSeries is a twin-engine, medium-range jet airliner, the biggest and most complex plane that Bombardier Aerospace of Canada has yet built. It comes with significant technical and logistical challenges that could make or break the company. The CS100 version with 110 to 125 seats will use the Pratt & Whitney PW1500G GTF engine producing 21,000 lb thrust while the CS300 that can carry 130 to 145 passengers will have the same engine rated at 23,300 lb thrust. Long experience with regional aircraft has prompted Bombardier to design its systems and structure for ease of access and repair, given the vulnerability of high-utilisation fleets to impact by ground vehicles. The forward and main fuselage is made of aluminium-lithium, while the engine nacelles, belly fairing, wing, rear fuselage and tail assembly are composites. Bombardier has prudently made provision for the use of temporary sheet-metal repairs on damaged composite areas, which might be replaced later with composite parts.

The CS100 is expected to enter service in 2013, followed by the CS300. So far Bombardier has firm orders for 133 planes, 119 options and 10 purchase rights, the target being 300 orders by the launch date. However, many airlines seem to have adopted a "wait and watch" approach to the new yet-to-be-proven plane.

What about turboprops? Many see them as the most cost-effective method of serving short-haul markets, especially with rising oil prices. Turboprops, which constituted only 15 per cent of the regional fleet in 2001, are now 40 per cent and rising. Aerospace majors, Bombardier or ATR, intend to cash in on the demand by increasing the size and capability of their turboprop offerings for potential customers of 90- to 100-seat capacity. However, both manufacturers have deferred the decision on programme launch to 2012. Their decision will be contingent on timely availability of new fuel-efficient turboprop engines.

LAST BUT NOT THE LEAST. What is there in the regional jet domain for India? Around 90 of the 454 airfields in the country are operational; of these, just 36 runways can take an aircraft

Bombardier Q400 turboprop

of the Boeing B737 class. With determined effort by the government, perhaps 120 airfields with runways of 3,000 to 5,000 feet length can be readied for regional jets or turboprops bringing half the country's population to within the convenient reach of aviation services. By 2025, demand for regional aircraft in the 70 to 100-seat segment in India is expected to reach 250. This space is currently occupied by ATR 72 and Bombardier Q400 turboprops.

A government-sponsored move is under way for the country to produce a new regional transport aircraft (RTA). The commercial viability of the project has been confirmed by a group of experts and the proposal reportedly received in-principle approval from the Planning Commission in August. The development programme will be led by the National Aerospace Laboratories (NAL) with the help of a private partner. The baseline design is probably a 90-seat twin turbofan aircraft. The overall configuration of the aircraft has reportedly been finalised and specifications of the three major sub-systems, engine, avionics and control systems, drawn up. It is expected that production will commence with about five aircraft in 2017, the fifth year after the project launch next year. Production will eventually go up to 36 aircraft per year.

At present the Bombardier CRJ series of which the 86- to 104-seat CRJ1000 is the latest and the Embraer E-Jet family of which the 108- to 122-seat E195 is the latest and largest, rule the roost. It will take many years for the new offerings, with significantly lower fuel consumption and maintenance costs to establish themselves. By 2020, Bombardier and Embraer could begin to feel the heat. But is there room for so many players in the market? While the Russian SSJ, Chinese ARJ21 and Indian RTA can hope to secure orders in their respective countries, there are markets globally, still untouched by the regional jet revolution. Airlines in Asia, the Middle East and South America are beginning to discover the potential of regional aviation to build their networks, right-size their fleets and achieve higher levels of efficiency. But in order to compete with Embraer and Bombardier, the new manufacturers will need to price their planes competitively without compromising on quality, performance or reliability. Is this a tall order? SP

OBSTACLES GALORE

Helicopters are smaller craft and lack the capability to circle for prolonged periods in the congested traffic patterns at Indian metros. There exists, therefore, a clear need for the two types of traffic to be segregated and operated from independent, non-interfering landing/take-off areas along well-defined approach and departure corridors.

Sky Shuttle's AW691 lands in Hong Kong Heliport

PHOTOGRAPH: Sky Shuttle

BY **A.K SACHDEV**

THE INVESTIGATION INTO THE Mi172 helicopter accident at Tawang in April this year concluded that while the accident was survivable, passenger deaths were attributable to inadequate fire services, non-availability of crash equipment and trained personnel. This indictment should not come as a surprise to anyone familiar with helicopter operations in India. The term "heliport" is often used to refer to a helipad. However, the technical import of a "heliport" that stipulates minimum facilities and support services required for safe operations, is not adequately understood. The operators tend to ignore the stipulations and the Directorate General of Civil Aviation (DGCA) does not have the manpower to audit and inspect the heliports in regular use. So what is a heliport and why is it difficult to ensure safety in heliports in India?

FIXED VS ROTARY WING OPERATIONS. To answer the question, we need to look at the nature of operations by helicopters vis-à-vis fixed-wing aircraft. Briefly differentiated, fixed-wing aircraft land and then stop, as opposed to helicopters which do the reverse—stop in the air and then land. The capability to hover permits helicopters to land in spaces just adequate to physically accommodate, giving them the advantage of operating from confined or built-up areas such as in the middle of a city.

The very nature of helicopter operations requires a different approach, a philosophy the International Civil Aviation Organisation (ICAO) has enshrined in its Standards and Recommended Practices (SARPs). Annexure 14 of the Convention on International Civil Aviation deals with Aerodromes and its Volume II is a document entitled "heliports" that are "areas intended for the exclusive use of helicopters at an aerodrome primarily meant for the use of fixed-wing aircraft." The document defines the minimum requirements for a heliport as "an aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters."

A 'heli-deck' is defined as a heliport located on a floating or fixed offshore structure such as on offshore oil rigs. The document provides definitions and dimensions of the touchdown and

lift-off area, the final approach and take-off area and the safety area in quantified terms so that even non-instrument operations can be conducted safely. The DGCA has issued three civil aviation requirements (CARs) related to helicopter operations from heliports/landing areas in Section 4—Aerodrome Standards and Air Traffic Services, Series 'B'. 'Heliports' is the title of the 83-page CAR issued in 2006 and is based on the ICAO document cited above. The two other CARs deal with "minimum safety requirements for temporary helicopter landing areas" and "minimum safety requirements for helicopter landing areas used on regular basis". These CARs circumscribe the safety and operational paradigms of helicopter operations and are highly restrictive.

One of the basic traits of regulations is that these should be readily acceptable to the operators. Alternatively, if willing compliance is not forthcoming, the regulator ought to have the wherewithal to enforce it. Unfortunately, the three CARs are neither acceptable to all, nor is compliance guaranteed by the DGCA for reasons stated earlier. Oversight of the increasing number of helicopter landing areas is undoubtedly a massive task. Thus, adherence to the CARs is left largely to the operators, some of whom display a cavalier approach to regulations, both in letter and in spirit. Moreover, helicopter flights undertaken for VIP transportation render the task of ensuring compliance even more challenging. With the time factor prevailing over operational safety, VIPs often overrule the decisions and suggestions by pilots and even pressurise them to adopt a course of action clearly unsafe or imprudent.

The CAR on landing areas for regular use concedes that certain helicopter landing areas that are not fit to be classified as heliports are being used for regular operation. Owners of such facilities, whether state governments or others permit their regular use without assuming the responsibility for operational aspects such provisioning support services and air safety. The CAR goes on to accept that regulatory oversight cannot be performed over such areas due to various factors such as periodicity of operation, geographical location and sheer numbers. It is significant that while the CAR on "heliports" was issued in 2006, the one on regular use landing areas was promulgated only in August 2011. The timing of its promulgation suggests that it was probably inspired by the crash at Tawang.

THE TECHNICAL IMPORT OF A "HELIPORT" IS NOT ADEQUATELY UNDERSTOOD

SEPARATING FIXED AND ROTARY WING TRAFFIC. One constant gripe from helicopter pilots is that the approach of air traffic services is biased in favour of fixed-wing operations and that all procedures are formulated accordingly. While air traffic control (ATC) officers justify this as being a safety-driven requirement and quote the fiasco with the President's helicopter at Mumbai as an example, helicopter operators cite dense but efficient mixed traffic patterns in the US and Europe as models to emulate. Captain Charles Schmitt, Adviser, EU-India Rotary Wing, has gone on record having shown concern at the way the Airports Authority of India (AAI) handles helicopter traffic especially at the metros. As per Schmitt, "Helicopters in India are not being used like helicopters but as fixed-wing aircraft resulting in long avoidable delays during departures/arrivals especially from metro airports."

The problem is that within a radius of 50 nm around international airports, traffic is restricted to instrument flight rules (IFR). Only circuits and landings are permitted under visual flight rules (VFR) conditions once in visual contact with ground. Helicopter operators on the other hand prefer to operate under VFR. Even where it is possible for helicopters to operate under IFR, it is very difficult for air traffic controllers to integrate fixed and rotary wing traffic given the large disparity in approach and landing speeds. Besides, helicopters are smaller craft, operate with limited fuel reserve and lack the capability to circle for prolonged periods in the congested traffic patterns at Indian metros. There exists, therefore, a clear need for the two types of traffic to be segregated and operated from independent, non-interfering landing/take-off areas along well-defined approach and departure corridors.

On February 13, 2008, a meeting was held at the Ministry of Civil Aviation (MoCA) between officials of the MoCA, DGCA, AAI and Pawan Hans Helicopters Limited to discuss the implementation of Kaw Committee report which had recommended provisioning heliports/helipads and separate routes for helicopter operations. As a follow-up, a Heliport Committee was constituted by the MoCA under the Chairmanship of R.P. Sahi, the then Joint Director General, DGCA, to examine the issue. The Ministry ordered a survey of the facilities existing at metro airports for helicopter operations as also to identify land for heliports and landing areas within and near metro airports with separate facilities for helicopter operations. The committee was also asked to recommend the procedures to segregate helicopter traffic wherever possible.

While the process for facilitating heliports and helicopter routes continues, some steps have been taken to establish the procedures for separate corridors/routes for helicopters, especially at Delhi and Mumbai, although slowly. However, the controllers at metros are loathing to use these and generally resort to DME-based last-mile routings for the arriving helicopters. Helicopter pilots, in general, find the steps taken in this direction inadequate. Juhu, an airport with a runway, has been designated a helicopter base. Technically speaking, it could be called a heliport now as only helicopters are permitted to use it for landing and take-off, with small fixed-wing aircraft operating there occasionally.

THE FINAL WORD. Bringing the focus back on heliports, the point needs reiteration that the CARs on the subject of heliports and landing areas are quite restrictive and the DGCA is incapable of ensuring full compliance. What is really required, is a safety culture and a sense of responsibility amongst the operators so that the pilots fly under safety envelopes limited by the performance of their machines and their own professional skills. Established landing areas such as the helipad at Mahalakshmi in Mumbai, in the glare of the media or in the proximity of DGCA regional offices, can be monitored easily. Mahalakshmi was recently shut down by the DGCA for safety reasons. However, proliferation of landing areas is such that self-discipline on the part of the operators would appear to be a better choice than a feeble attempt by the DGCA to impose an over-restrictive regulatory framework. The imperatives of a mission could sometimes override the safety considerations for a commercial operator, and as the DGCA currently lacks the capability to monitor heliport/landing area facilities, helicopter operations in India will continue to be improperly regulated and the advantages of rotary wing unexploited, at least for a few more years. SP

AUTOMATION COMPLACENCY

Cockpit automation has provided numerous benefits and has extended system functionality well beyond human capabilities. Yet the question arises, can there be too much of it?

PHOTOGRAPH: Air France

BY **DR MANI SISHTA**

FROM PRELIMINARY REPORTS OF the first Airbus A320 crash at Bangalore, it appeared that the accident had a lot to do with the Captain being unable to comprehend the 'fantastic' cockpit automation technology that was then available on that airplane. The Captain was a young family man who could have either promised or even procured a vaunted desktop computer for his children. In all probability, that desktop, with a 'fast' 480 chip, would have been the talk of the neighbourhood and a source of pride and joy within his immediate family. His kids would have mastered its usage haltingly explaining its simplicity to an otherwise busy dad, and their mom would have gamely tried to figure out this modern wonder.

The dad grudgingly accepted that his airplane had numerous such computers on board and that these were somehow insulated from all faults—either on their own or during interaction with the crew. Besides, there were backups, he was told. That generation of pilots, still fill the skies, while the newer generation occupy the co-pilot's seat.

While the older generation of pilots have a healthy regard for automation, the 'gen-next' pilots are a lot more skeptical about the 'bugs' and 'glitches' that still emerge. The former would any day prefer a tried and tested single or dual purpose cell phone, while the newer generation prefers to flaunt a new iPhone or Blackberry, not to mention the iPad.

The term "automation complacency", which can be found in the new Directorate General of Civil Aviation (DGCA) syllabus on 'human performance and limitations', has a certain 'wake-up' ring to it. While one cannot put a label on its implications, one can instantly identify with its psychological connotations.

HOW AUTOMATIC IS THAT?. Cockpit automation has

provided numerous benefits and has extended system functionality well beyond human capabilities. Yet the question arises, can there be too much of it?

Many years ago, the term 'manager' was applied to the Captain of an aircraft, indicating that his role was much more than that of a simple hands-on pilot. The manager had to deal with the related 'resources'—human, organisational, regulatory and technical. The following accidents highlight the problems associating cockpit automation with a human interface.

In 1983, a South Korean airliner was shot down South of Sakhalin, USSR. It had strayed into that hostile airspace due to a probable navigational input error due to incorrect coordinates having been keyed in. Lack of effective communication also played a role in the disaster.

In 1987, a Northwest Airlines MD80 crashed during takeoff due to an improper configuration of flaps and slats. A major factor here was the failure of the automated takeoff configuration warning system upon which the crew had become reliant. Not realising that the airplane was improperly configured, the crew had neglected to carry out a physical check. Their dependence on automation to monitor this led them to become complacent, resulting in a lack of awareness about the functioning of the automation system or the critical flight parameters they expected the system to monitor.

In 1989, a Boeing 737 landed in the river near New York's LaGuardia airport. The precipitating cause was the accidental disarming of the auto-throttle. Neither the Captain nor the First Officer had monitored the critical flight parameters which led to the accident.

The case of overshooting Mumbai airport by a snoozing crew on a short flight from Goa and another case where the Captain had consciously programmed a lower all-up weight, in order to gain better 'mileage' but only ended up with a near stall at service ceiling, or the case of a Dubai-Pune flight, where the co-pilot was effectively paralysed by events when the Captain had gone to the rest room or a situation over Nagpur, where experienced pilots failed to 'register' their passing overhead till overdue by more than half an hour, are some of the instances in which automation brought about complacency.

In each of the above, somewhat overwhelmed by complacency, the crew was unaware of the critical features of the system operating the aircraft. Was the latest Air France Flight 447 disaster over the South Atlantic for similar reasons? The list could well go on and on but are we now looking at a new genre of human incapability and limitations while flying airplanes? Are we looking at a new breed of pilots who are able to man the aircraft for a few minutes—only during landing or takeoff?

THE HUMAN FACTOR. Acknowledging the rapidly changing and irreversible trend towards automation, terms such as 'cockpit resource management' emerged, soon to be replaced by 'crew resource management'. Concepts of threat and error management evolved, mostly due to this inter-dependence of 'dumb' cockpit automation and the 'dumber' human being. 'Smart' computers on board were actually another 'persona' —a team of highly qualified software geniuses and a sprinkling of experienced pilots, to be dealt with.

But it was the software guy who was quaffing beer when his brainchild malfunctioned half-way across the globe or was misinterpreted by the dumb human resulting in an accident. Stick-shakers, numerous audio and visual warnings are the aircraft's way of communicating with humans. Aviation history is replete with stories of how every generation of warning devices have been misinterpreted. If you thought an automated cockpit made the human role redundant, think again. On the contrary, it has made his or her role as a monitor even more vital.

Pilots are supposed to monitor for failures in the automation system and the effective presence of conditions that this system was designed to handle. Furthermore, most automation has been piecemeal and covers some functions but not others. The human factor has remained as an 'integrator', monitoring the automation for some functions and performing some other functions himself. Sadly, man has proved to be not ideally suited for these monitoring functions.

A shortcoming associated with the advent of automated systems has been dubbed the "out-of-the-loop" performance problem of humans. Human beings tend to be slow in detecting a problem that has occurred. Once detected, additional time is needed to determine the state of the system and sufficiently understand the problem before arriving at the response required. The extra time associated with performing these steps can be critical, prohibiting the very activities that humans are there to deal with. The results vary from slight delay to inaction resulting in catastrophic events.

What are the human mental components required to maintain a high level of vigilance against automation complacency? What are the coping strategies experienced pilots employ to avoid such complacency? What future strategies should designers of automated systems employ, keeping in mind human drawbacks when looped into such automated systems? Each of the above-mentioned accidents/incidents can be directly linked to a lower level of situational awareness that is now known to exist especially when pilots operate highly automated systems.

The use of integrated data is here to stay. From an industrial engineering perspective, a noted problem is that many systems lack information salience that accompanies automation. So what if the source of data or its reliability or value of the constituent data underlying the integrated information is unavailable?

STICK-SHAKERS, NUMEROUS AUDIO AND VISUAL WARNINGS ARE THE AIRCRAFT'S WAY OF COMMUNICATING WITH HUMANS

Frequently, displays associated with complex automated systems involve screens with information embedded in hierarchical displays that may be associated with system modes. Some problems include getting lost in menus, finding the desired screens and interpreting cluttered displays. Take, for instance, the glass cockpits which look so neat and organised with their multi-functional, multi-coloured displays. But the absence of 'raw data' or the 'underlying information' beneath the seductive, 'integrated' data can be troublesome. Such 'processed foods' reduce the vital mental involvement of the pilot leading to complacency. This may be remedied through proper orientation, design and training.

What the creators of aviation software technology now need to know is how to perk up the human factor in the cockpit and make the pilot more vigilant to the monitoring role he has now been destined to perform. An inescapable conclusion of the (training) powers that would be to review their practices so that overdependence on automation systems is not only acknowledged as real but also 'diagnosed' and 'treated' on time. SP

Air France A330-200 F-GZCP lands at Paris-Charles de Gaulle Airport

IMPROVE TROUBLESHOOTING SKILLS

In an age of technically-sophisticated aircraft with quadruple-redundant systems, how many pilots train for high altitude manual flying, leave alone handling emergencies simultaneously?

BY **JOSEPH NORONHA**

FEW THINGS CAN BE as disconcerting to air travellers as an unexplained aviation disaster. That is why the crash of Air France Flight 447 on June 1, 2009, attracted so much attention. How could a large modern airliner being piloted by a competent crew practically disappear without a trace? More than two years on, many of the missing pieces of the puzzle have been retrieved from the depths of the Atlantic Ocean. In July, France's Bureau d'Enquêtesetd' Analyses (BEA) that is investigating the crash presented its third interim report, leaving only a final report for early next year. Has the mystery been solved?

LOSS OF CONTROL. Air France Flight 447, an Airbus A330-203, was a scheduled flight that departed Rio de Janeiro at 10:29 p.m. on May 31, 2009, bound for Paris. A few hours later, it crashed into the Atlantic killing all 216 passengers and 12 crew onboard making it the deadliest accident in the history of Air France. The first sign of trouble appeared three hours and 40 minutes after take-off, while cruising at 35,000 feet over the Atlantic. The Captain, Marc Dubois, who had 11,000 flying hours to his credit, had left the cockpit for a well-deserved rest, a routine feature on long flights. His co-pilots, David Robert, with 6,500 hours experience and Pierre-Cédric Bonin with 2,900 hours, were in the cockpit. The weather was foul and the plane had to fly though areas infested with storm clouds. Minutes later, the aircraft encountered mild turbulence. The chilling account of events thereafter was reconstructed using the flight data recorder (FDR) and the cockpit voice recorder (CVR), recovered from the wreckage on the seabed off the Brazilian coast in May, following a long and arduous search.

The FDR shows that the autopilot and auto-thrust had suddenly disengaged probably because icing had blocked the pitot tubes resulting in speed sensor discrepancy. The jet also rolled to the right. Bonin, who was the pilot flying (PF), tried to regain control. He levelled the wings and in a simultaneous and possi-

PHOTOGRAPHS: Wikipedia & Air France

bly inadvertent motion of the A330's sensitive side-stick (which provides no "feel" feedback), he pulled backwards into a 7,000 ft/min zoom climb to 38,000 feet. With the nose well above the horizon and airspeed still decaying, the stall warning sounded. This seems to have taken the PF by surprise, because the airspeed on his instrument probably showed an increase which can happen if the pitot tube gets blocked in a climb. The FDR indicates that he continued to hold the stick back for almost three minutes, while the huge plane was descending at more than 10,000 ft/min in a stalled condition, unknown to him. Also, if transport pilots hear the stall warning which indicates an approaching stall, rather than a fully-developed one, they are trained to increase power and "fly out of the stall" without losing altitude.

That may be what the PF intended. But in the absence of an angle of attack indicator in the cockpit, he could not have known that the plane was far too deeply stalled and at too high an altitude to recover using power alone. A stall warning is triggered by the angle of attack sensor. However, since the speed measurements at the time were lower than 60 knots, the electronic flight control system (EFCS) rejected the angle of attack values as invalid and the stall warning was silenced. The warning came on again around a dozen times during the descent, but since vital instruments like the airspeed indicator and the autopilot had malfunctioned, the PF seems to have been unable to mentally register the stalled condition and recover from it. Informed by the pilot not flying (PNF), the captain rushed into the cockpit. However, the recorded comments, according to the BEA report, showed "total incomprehension of the situation and they are heard saying several times that they don't know what's going on." No emergency message was transmitted. The BEA report confirms that this crash, after a frightening 3½-minute plunge in stormy weather and near-total darkness, was another in a series involving "loss of control", now the main cause of civil air accidents. According to the International Air Transport Association (IATA), at least 51 accidents have occurred over the past five years in which planes stalled in flight or got into unusual attitude from which pilots were unable to recover.

Although the narrative of Flight 447 has been reconstructed from the FDR and the CVR, it is unclear whether the pilots were looking at the same parameters in the cockpit. Some displays, perhaps even the EFCS, may have malfunctioned during the descent. This might explain why none of the pilots was able to diagnose the problem and recover. The stall warning may have added to the muddle by sounding only intermittently although the plane was stalled throughout the descent. And how could the pilots know which instruments were reliable and which were not? With all the malfunctions, warnings and error messages that they were being subjected to, the situation must have been thoroughly confusing.

COFFIN CORNER. Flying at high altitudes is vastly different from flying at low levels. At 35,000 feet, for instance, a fully-loaded Airbus A330 has hardly any margin for handling errors. Dropping airspeed by just 25 knots can lead to an aerodynamic stall. On the other hand, increasing speed by 25 knots might make the plane exceed its maximum permissible speed and run into compressibility effects. Climbing higher reduces the margin both ways, ultimately closing the gap between the speed for a low and high-speed stall. This point is informally but quite appropriately called the "coffin corner". Particularly when flying in turbulence, it is possible to compromise the low speed margins and invite trouble. That is why flying on autopilot is mandatory above 24,000 feet.

The icing of the pitot tubes that led to the sudden failure of the airspeed indicator was not a minor issue. It meant a sudden reduction in safety margins and high workload for the crew. Prior to this, there were at least 53 instances in which flights had faced control problems on account of faulty airspeed indicators. Airbus itself reported 32 incidents between 2003 and 2009 that were attributable "to the possible destruction of at least two gauges by ice." Among other symptoms listed by Air France were disconnection of the autopilot, a switch to "alternate law", and the possible sounding of the stall warning. In the Airbus EFCS, the pilots cannot assert individual control outside a predefined envelope that guarantees the stability of the aircraft. As long as the autopilot and engine auto-thrust are engaged and the system operates in "normal law", the pilot cannot over-speed, stall, overbank or overload the machine. This greatly enhances safety. But the hitch was revealed in this case when control was suddenly passed from the EFCS to the pilot in the middle of the emergency. The aircraft was now in the realm of alternate law where many of the A330's protections disappear, leaving only low and high-speed stability, load-factor limitation and yaw damping. Since the PF maintained significant back pressure on the side-stick, the aircraft stalled when the critical angle of attack was exceeded.

AUTOMATION ANXIETY. The narrative of Flight 447 points to a more widespread problem, the automation addiction. In an age of technically-sophisticated aircraft with quadruple-redundant systems, how many pilots train for high altitude manual flying, leave alone handling emergencies simultaneously? Customarily flying on autopilot (a most accurate, comforting and addictive practice) means that the crew rarely if ever, get to feel how the aircraft handles at height. In fact, few airline pilots have ever experienced a stall in the aircraft they regularly fly. During training, the standard has been to recognise an approaching stall and recover before the aircraft actually stalls. This may be due to aircraft or simulator limitations. But it is also possible that airlines are reluctant to spend time and money to train pilots for one-in-a-million possibilities. The latest BEA report recommends mandatory training for all pilots to fly planes manually and to recover from high-altitude stalls. Otherwise, if pilots are suddenly faced with stalls or other unusual circumstances, they may find themselves unprepared, in unfamiliar and unknown territory. Safety experts are increasingly encountering cases where pilots suddenly confronted with a loss of automated flight controls are unable to respond appropriately. However, emphasising manual flying training alone may not meet the requirements, because pilots spend only a few days a year in training. Airlines may have to rethink their basic operating philosophy to give pilots a realistic opportunity to keep their flying skills honed.

EVERY MAJOR AIRLINE LAYS STRESS ON CREW RESOURCE MANAGEMENT TRAINING

A crucial question may also be put to control automation system developers. Can fail-safe laws and specifications ever be written that will cover all possible situations and control inputs that may be applied, especially by pilots preoccupied by handling an

THERE SEEMS TO BE AN URGENT NEED TO IMPROVE PILOT TRAINING FOR UPSET CONDITIONS OR UNUSUAL ATTITUDES

emergency in bad weather? Or could there be more pitfalls hidden in millions of lines of software code? It is quite ironical that when the going got tough, the automated system gave up, leaving the hapless pilots in the lurch.

PITFALLS IN TRAINING. Let us return to the pilots. Even though the stall warning appeared several times, once continuously for 54 seconds, the pilots did not make any clear reference to it nor did they formally identify the stall. The importance of identifying an emergency accurately cannot be overstated. However, had the crew even recognised their predicament as an aerodynamic stall, their training might have proved inadequate. Basic theory lays down that to recover from a stall, the nose must be lowered. But considerations on a large transport aircraft are different. For one thing, a fully developed stall is highly unlikely; for another, while flying in IFR, control of altitude is particularly important to avoid the risk of collision. The standard procedure that pilots have been taught for an approaching stall at low altitude is to raise the nose by around five degrees and apply maximum thrust.

There seems to be an urgent need to improve pilot training for upset conditions or unusual attitudes. If pilots are regularly taught avoidance, recognition and recovery, there are better chances that they will react properly. While simulators are invaluable for this type of training, they cannot possibly replicate the characteristics of a full stall accurately. Since the accident, both Airbus and Boeing have accepted that classical high-power recovery is not appropriate for every stall condition. Simply applying maximum thrust might not work at height where the available thrust is limited and the engines require time to spin up. The technique does nothing to reduce the angle of attack. It is also possible that pilots may fail to realise that the aircraft has progressed from a near-stall into an actual one, and continue to apply a recovery method that is no longer effective. Hence, the new technique places greater emphasis on reducing the angle of attack. It advocates lowering the nose of the aircraft, regardless of altitude, and if necessary, reducing thrust to avoid excessive acceleration. The BEA also recommends that safety regulators worldwide consider requiring commercial jet manufacturers to include an angle of attack indicator in the cockpit.

TRAINING. Every major airline lays stress on crew resource management (CRM) training and Air France is no exception. Strangely though, till now, CRM training does not seem to have envisaged a crew with two co-pilots in control. The captain of Flight 447 had "implicitly" appointed the younger co-pilot as his relief before leaving the cockpit. The BEA report brings out that there was no clear task-sharing between the two co-pilots. "No standard callouts regarding the differences in pitch attitude and vertical speed were made," it continues. The PF twice said that he had lost control of the plane. It took another 27 seconds for the PNF to take control but in an action that violated basic airmanship the junior pilot retook control almost immediately without any announcement. Both pilots briefly made simultaneous inputs on the sidestick, which prompted a vibrating warning on the stick. Although the captain returned to the cockpit, he never took over the controls and remained in the background. Neither were the co-pilots able to fill him in on the situation nor did he ask key questions. The report called for one crew member to be designated as "relief captain" whenever co-pilots are left together in the cockpit.

The crash also brought out the vital importance of a strong survival instinct. After thousands of routine flights, sudden major emergencies can have a huge impact even on highly experienced pilots. It takes great discipline to be able to focus on the task at hand. It should be instilled in pilots that in the event of an emergency they must first concentrate on regaining control of the aircraft. Only then should they start tackling other problems. There is also the need for more simulator training, particularly increasing the level of distraction and the "startle" factor to the extent possible.

There is no denying the fact that airline safety is increasing. The past decade has seen a dramatic drop in fatal airline accidents in the US. And for the first time ever, a year has passed without any fatalities on commercial aeroplanes and helicopters operated by European airlines. But that is no cause for complacency. The BEA report appears mainly to point to pilot error leading to loss of control. Indeed, the crash of Flight 447 should never have happened. It must not be forgotten that but for a technical failure, it would not have happened. Neither is it irrelevant that had the crew been properly trained to anticipate trouble and deal with it, the crash might have been averted. Aviation mishaps like these can have a profound impact on training and operations and, consequently, help prevent future accidents. If so, 228 lives will not have been lost in vain. SP

EYE IN THE SKY

The advanced technology of helicopters and the state-of-the-art equipment available today have made aerial filming not only safe and cost-efficient, but also capable of producing high-quality and stable images. The Commonwealth Games was the first time that live coverage of events by helicopters on such a large scale was carried out in India, and was a huge success. Four Eurocopter choppers were put into action to cover the event.

AERIAL FILMING BY USING helicopters has become a 'staple' in the movie-making business, both in the West and in India, for that spectacular aerial shot that gives movies that extra dimension. The news channel industry closely follows suite. Large-scale sporting events such as Formula 1 Grand Prix, Tour de France (where 11 helicopters were used for coverage in 2011), and closer to home, the recently held Commonwealth Games (CWG) hosted by India in 2010—viewers were treated to an amazing bird's-eye view of the action, as it happens.

The benefits of aerial filming have been most evident in the widespread use of helicopters for electronic news gathering (ENG) services. High-tech heliborne ENG services have become an essential source for today's leading news agencies and reporting departments the world over for source video, live news coverage, broadcast quality documentation and breaking news situations.

For example, when a natural disaster strikes, viewers have been live witnesses to the action as it happens through aerial views of the location to supplement their understanding and awareness of the situation. News agencies in developed markets like the US, Europe and the Far East have been using aerial footage from helicopters for a long time. The use of helicopters for news coverage has provided these news agencies the crucial edge in today's growing and competitive news gathering market.

One of the most popular ENG helicopters in use today is the Eurocopter AS350 from the "Ecureuil" family. This rotary-wing aircraft can be fitted with fully high definition, vibration free, gyro-mounted cameras to get crystal clear images without any disturbance, and has a competition-beating 3.5 hours of flight endurance while fully equipped. Besides being comfortable, the cabin is also highly flexible to be altered for different needs as the situation demands.

These flying machines from Eurocopter are armed with the latest Star Flex technology, which ensures low vibration level, thus resulting in a shake-free shoot for the cameraman. The large flat-floor open-space cabin in the Ecureuil helps in enhanced visibility and clutter-free shooting experience for the crew.

Ecureuil helicopters are also known for the lowest operating and maintenance costs involved in operating it. These choppers also have the added ability to be safely operated and make film shoots possible at extremely high altitudes and extreme temperatures.

The use of helicopters for aerial coverage is increasingly being appreciated in markets like India. The CWG 2010 was the first time that live coverage of events by helicopters on such a large scale was carried out in India, and was a huge success. Four Eurocopter choppers were put into action to cover the event for Indian broadcaster, Doordarshan, which received tremendous praise from the global audience for its spectacular coverage of the ceremonies.

Also, Bollywood filmmakers have taken a liking to helicopters as they can choose to either be on board or direct from the ground with a remote video link to the helicopter above to shoot.

In this day and age where the public expects breaking news at their fingertips and films with high standard of cinematography, what the helicopter does in producing such results, has been treated as a "given". The advanced technology of helicopters and the state-of-the-art equipment available today have made aerial filming not only safe and cost-efficient, but also capable of producing high-quality and stable images. SP

—SP'S SPECIAL CORRESPONDENT

PHOTOGRAPH: Eurocopter

Jet Airways induction of ATR-72-500 marked the dawn of the turboprop era in India

FLYING A TURBOPROP

The Q-400 and the ATR-72 are both twin-engine turboprop aircraft and carry around 70 passengers. Both are high-wing, with a T-tail and are powered by Pratt & Whitney engines with six-bladed propellers.

BY **VASUKI PRASAD**

TWO OF THE WORLD'S most popular regional turboprop aircraft are the ATR-72 and the Bombardier Q400. However, the Indian short-haul segment has so far been dominated by the ATR-42 and the ATR-72. Produced by Alenia Aerospace of Italy and European Consortium EADS, the ATR has monopoly in operations at the smaller airfields, low traffic density routes or in the challenging operating environment of Northeast India. Despite a lower level of comfort as compared with a jetliner, the propeller-driven ATR-72 is extremely popular especially for its low fares. More economical to operate than a jet, the aircraft rakes in money for the airlines too. No wonder then that Kingfisher operates 25 ATR-72-500 while Jet flies 20.

SpiceJet, which has so far been operating only Boeing jetliners, has begun induction of 15 Q400 turboprop aircraft to compete in the ATR-dominated segment. And for the first time in India, the public may in fact be 'proud to fly a turboprop'. With a quieter cabin that has comfortable seats and larger windows for enhanced view, spacious overhead stowage, the Q400 boasts speeds only slightly lower than a jet and available at a comparatively lower capital cost.

Delivering the jet experience at the economics of a turboprop, the Q400 NextGen from Bombardier Aerospace is definitely poised to revolutionise short-haul operations.

TURBOPROPS IN INDIA. October 1999 witnessed the dawn of the turboprop era in India with Jet Airways inducting the ATR-72-500. According to Nikos Kardassis, the then CEO, Jet Airways, the turboprop is ideal from a cost perspective on feeder routes given the demand-supply ratio and more importantly its operat-

PHOTOGRAPHS: ATR, Bombardier

ing economics. The turboprop is ideal for some destinations on our domestic network especially for providing air links to smaller cities where the existing airports have only just been remodelled to accommodate smaller aircraft. The economics of a turboprop made immediate sense on short-haul operations, opening routes which were earlier considered unprofitable. Air Deccan, the pioneer of the low-cost carrier (LCC) concept, commenced operations with four ATR 42-500s in August 2003. Kingfisher Airlines inducted its first ATR-72-500 in March 2006. In a business with wafer-thin margins, turboprop appeared to be the way to open up new markets and generate profits even with low sub-optimal load factors. But the subcontinent knew of only manufacturer—ATR.

IDEAL AIRLINER. The block time for Kingfisher Airline's Bangalore-Pune flight is 80 minutes for Airbus A-320 but two hours for ATR 72-500. The ATR flight is operated close to midnight when traffic is low and the time factor is not critical. At other times of the day when demand is high, a turboprop would be viable if it is in close competition with the jet in respect of speed, capacity and cost. The ideal combination, therefore, would be an aircraft with the speed of a jet and the economy of a turboprop. The Q400 is Bombardier's solution to this. SpiceJet has already ordered 15 with the option for another 15.

The Q400 and the ATR-72 are both twin-engine turboprop aircraft and carry around 70 passengers in four atleast seating, although the Q400 seating capacity rises as high as 80 passengers. Both are high-wing, with a T-tail and are powered by Pratt & Whitney engines with six-bladed propellers. The ATR-72-600 variant features a full glass cockpit akin to that on the Q400.

Compared with the ATR-72, the Q400 has a longer fuselage, appears sleeker and has a dorsal spine from the wing-box to the rudder. The engines are larger and unlike the ATR-72, extend beyond the trailing edge of the wings. The main landing gear of the Q400 is mounted under the engines rather than in the fuselage as in the ATR giving a 'clean' appearance. The wheel-base of the Q400 is double that of the ATR-72 making it far more stable on the ground. With a longer and sharper nose, the Q400 has an 'aggressive' appearance vis-a-vis the ATR-72 which appears docile.

Parameter	Q400	ATR-72 min seating	ATR-72 max seating
Revenue Flights	10	9	9
Revenue Seats/Flight	78	66	72
Available Revenue Seats	780	594	648
Revenue Potential of Q400 over ATR72	—	1.313131313	1.2037037

RIVALRY IN THE AIR. Although the Q400 and the ATR-72-500/600 are similar in weight, the engines of the former deliver nearly twice the power of any variant of the ATR-72 facilitating a faster climb to service ceiling of 25,000 feet. The cruising speed of the Q400 is 360 knots while that of the ATR-72 is 276. On a sector that takes two hours for the ATR-72, the Q400 can cover in an hour and forty minutes with a cruise speed of 360 knots. Better performance doesn't come free. The 30 per cent higher fuel burn on the Q400 is offset by the marginally higher passenger capacity and jet-like speed with fuel consumption lower than a jet of comparable size.

Bombardier's Q400 NextGen

OPERATING ECONOMY. Operating economy is the primary consideration for an airline, particularly a low-cost carrier, in the selection of an aircraft. The advantages regional turboprop aircraft operators in India enjoy are a highly concessional sales tax on aviation turbine fuel at four per cent as compared to 28 for jets and exemption from landing charges for aircraft with less than 80 seats.

The average sector distance in South India is 300 nm. Considering that at high speed cruise the Q400 takes just over an hour to cover this distance and the ATR-72 an extra 15 minutes, and that both aircraft start operations at 0600 hours and wrap up by 2330 hours, the Q400 can fit in one extra round trip in the 17.5-hour period. In addition, SpiceJet Q400 will have marginally higher capacity being configured with 78 seats as against 66 to 68 on the ATR-72.

For similar time airborne, as fuel consumption on the Q400 is 30 per cent higher than on the ATR-72 under similar operating conditions, the former's operating costs will be higher. Claims by Bombardier and ATR differ on direct operating costs (DOC). As per the former, in the European environment, DOC of the 78-seat Q400 for a 300 nm sector is 8.8 per cent more than that of a 68-seat ATR-72-500. However, ATR believes it to be 25 per cent higher. Over the 17.5 hour period in

Q400 Start	ATR-72 Start	Taxi Out	Q400 Flight Time	ATR-72 Flight Time	Taxi In	Q400 Finish	ATR-72 Finish	Turn Around
06:00	06:00	00:10	01:02	01:15	00:05	07:17	07:30	00:30
07:47	08:00	00:10	01:02	01:15	00:05	09:04	09:30	00:30
09:34	10:00	00:10	01:02	01:15	00:05	10:51	11:30	00:30
11:21	12:00	00:10	01:02	01:15	00:05	12:38	13:30	00:30
13:08	14:00	00:10	01:02	01:15	00:05	14:25	15:30	00:30
14:55	16:00	00:10	01:02	01:15	00:05	16:12	17:30	00:30
16:42	18:00	00:10	01:02	01:15	00:05	17:59	19:30	00:30
18:29	20:00	00:10	01:02	01:15	00:05	19:46	21:30	00:30
20:16	22:00	00:10	01:02	01:15	00:05	21:33	23:30	00:30
22:03	00:00	00:10	01:02	01:15	00:05	23:20		

The economics of an ATR-72 seem to be far more attractive than that of the Q400.

the example, the Q400 will cost 1.3 times more to operate than the ATR-72-500. However, with a higher seating capacity, the Q400 has 1.2 to 1.31 times the revenue generating potential of the ATR-72-500. If one were to go by these figures, the Q400 and the ATR-72-500 appear to be in the race neck-and-neck.

While available revenue seats are only indicative of the potential, load factors which suffer seasonal variation, affect profits. The ATR-72 in India may break-even with a passenger load of around 20-25 passengers. As per Bombardier, considering the LCC fare structure, the Q400 in the US and European 300 nm environment breaks-even at 45 seats. This means that the Q400 operator must sell significantly more seats per flight just to break even. And finally, the acquisition costs. The Q400 is listed at approximately $30 million (₹135 crore) which is $7 million (₹31.5 crore) higher than the list price of the ATR 72-600. The discounted selling price varies based on the size of the order and the capability of the airline to negotiate.

GROUND HANDLING. The SpiceJet Q400 will have a single-class cabin with 78 forward-facing revenue seats. With similar configuration, the ATR-72 can have 72 passengers including two rear-facing seats, not much comfortable for passengers. The Q400 has forward and rear passenger doors on the left-hand side and a service door aft on the right-hand side. On the ATR, both passenger boarding and galley replenishment are carried out through the aft doors located opposite each other. The Q400 has a significantly larger cargo hold, not segmented like in the ATR-72, and has larger access doors. The main cargo hold situated at the forward fuselage is segmented to allow cockpit access. Besides, both cargo sections on a Q400 can be accessed from the outside, unlike in the ATR where the rear cargo hold must be accessed only from inside the cabin. The Q400 has cargo space of 438 cubic feet as against the 281 of the ATR-72. As for cargo loading, the ATR-72's forward cargo section is easier to load, as the cargo floor is about a metre high. However, in the Q400, the forward compartment is seldom used for passenger baggage and the rear cargo hold, which is about 1.5 metres high, requires a mobile ramp. Both the ATR-72 and the Q400 can be turned around in 25-30 minutes.

Cockpit of Bombardier Q400 NG

GROUND POWER. The right hand engine of the ATR-72 can be set to the "Hotel" mode, a feature wherein the engine continues running at idle power, but the propellers are prevented from rotating by propeller brakes. In this mode, the ATR-72 continues to receive electrical power to support air conditioning. Though there is saving on cost by using a normal engine for ground operations, ground personnel cannot access the right side of the aircraft for refuelling or replenishing the galley with the engine spewing hot gases. Sudden failure of the propeller brake could also pose a serious safety hazard. While wear and tear on the engine is also high, in case of a strong tail-wind, the engine may overheat. Parking into wind may not always be practical. On account of these limitations, the crew prefer to shut down engines leaving the aircraft without power source and air-conditioning if the ground power unit is not available.

The Q400, on the other hand, has a dedicated back-up power source on board by way of its auxiliary power unit (APU). The 61-kg Hamilton Sundstrand APS 1000 APU provides the aircraft with pneumatics and electric power but is limited to ground operations only. The advantages are twofold. Firstly, the APU may be used without danger to the ground crew. Secondly, engine life is conserved. A sensor turns off the APU as soon as the aircraft is airborne. Fuel burn on the APU of the Q400 and on the engine of the ATR-72 in the Hotel mode, are similar. SP

(To be continued)

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Éric Martel, President, Bombardier Customer Services & Specialised and Amphibious Aircraft, and Brad Mottier, VP and GM of GE Aviation's Business & General Aviation, celebrate announcement of engine service agreement

Boeing unveiled newest business jet for Chinese charter market

FAIR RECOVERY

Business aviation is poised for moderate recovery beginning in 2012, stated Honeywell Aerospace's Annual Business Aviation Outlook, released at the NBAA 2011

BY **SP'S SPECIAL CORRESPONDENT**

THE 64TH ANNUAL NATIONAL Business Aviation Association (NBAA) 2011 annual meeting and convention held from October 10 to 12 at Las Vegas witnessed increased participation of visitors. The industry also seemed upbeat about the future of business aviation. After four years of decline, business aviation is poised for moderate recovery beginning in 2012, stated Honeywell Aerospace's annual Business Aviation Outlook, released at the NBAA 2011. The Honeywell forecast was based on surveys of more than 1,500 flight departments around the world.

AT THE SHOW. A cabin mock-up of the new Citation Latitude was on display at the Las Vegas Convention Center. Cessna introduced the new Citation Latitude mid-size business jet at the start of the convention. The company launched the Citation M2 light business jet on September 26.

With space for a crew of two plus up to eight passengers, the Citation Latitude features Garmin G5000 avionics and a clean-sheet, 84-inch fuselage for a six-feet high, flat floor passenger cabin.

Preliminary specifications project the aircraft will operate at airports with runways as short as 3,900 feet (1,189 metres), will have a maximum altitude of 45,000 feet (13,716 metres) and will climb direct to 43,000 feet (13,106 metres) in 23 minutes. First flight of the Citation Latitude prototype is expected to be mid-year 2014, with FAA certification (Part 25) and entry into service expected in 2015.

Hawker Beechcraft Global Customer Support (GCS) announced that it has completed certification of a three-display Pro Line 4 to Pro Line 21 upgrade for the Hawker/Beechjet 400. The new system replaces the existing Pro Line 4 displays and upgrades the flight management system to FMS 6100. With this significant functional enhancement, operators now have access to electronic charts, XM weather/data, WAAS/LPV, ADS-B out, VHF datalink and an upgrade path for future airspace requirements. A two-year Corporate Aircraft Service Programme (CASP) warranty on new and existing Rockwell Collins equipment is included with the upgrade. The certification aircraft is on display at Hawker Beechcraft Corporation's static display at Henderson Field during the National Business Aviation Association Convention in Las Vegas.

Hawker also announced that it has broken ground on a new 48,000 square foot, company-owned factory service centre at the General Mariano Escobedo International Airport in Monterrey, Mexico. The facility, which is scheduled to open in the spring of 2012, will include a 13,400 square foot paint hangar in addition to a 24,000 square foot maintenance hangar and 10,700 square feet of office and customer hospitality space. This new facility will join the previously announced Hawker Beechcraft Services facility in Wilmington, Delaware. Together these two facilities will increase GCS' company-owned service centre support hangar space to over 600,000 square feet.

Embraer participated with a display of the complete range of business jets available in the industry. In the static display at Henderson Executive Airport (HSH), Embraer showcased the entry

PHOTOGRAPHS: GE Aviation, Boeing, HBC & Cessna

Hawker Beechcraft's 400XPR made its debut at NBAA 2011

NAA President and CEO Jonathan Gaffney (right) presents a speed record certificate to Eric Norber (left), president of ELJ Aviation. Norber set the class speed record for a Reykjavik to London course in a Cessna Citation CJ2+.

level Phenom 100, light Phenom 300, large Legacy 650, the newest mockup of the midsize Legacy 500, and the ultra-large Lineage 1000 business jets. There will also be a Legacy 500 fly-by-wire demonstration kiosk and a customer support area.

At NBAA, Bombardier Aerospace announced that it has strengthened its business aircraft sales team in China and Asia-Pacific to increase its focus on the growing activity and volume in the region. The territory is now overseen by a Vice-President and two Regional Vice-Presidents.

Bombardier and CAE announced that they are continuing to expand worldwide training support for business aircraft customers with the addition of a the newly added CAE-built simulator will be located at Bombardier's training centre in Montreal, Canada, and will be deployed in the second half of 2012. This deployment will significantly boost OEM-backed Challenger 300 aircraft pilot training, currently offered at Bombardier's training centre in Dallas, Texas, where the company operates an existing FFS for Challenger 300 aircraft.

GE Aviation and Bombardier Aerospace announced two new engine service agreements that will boost services support and provide additional peace of mind for Bombardier business aircraft customers. GE's OnPointSM solutions engine maintenance coverage is being offered on Challenger aircraft equipped with GE CF34 engines and Global 7000 and Global 8000 aircraft. Bombardier's five wholly-owned business aircraft service centres in the United States are named GE Authorised Service Centres for CF34 engines for business aircraft. GE's OnPoint solutions will offer customers the option to purchase a flexible and cost-effective engine service package tailored to their specific needs. Comprehensive OnPoint solutions are being offered on both the passport propulsion system that will power the ultra long-range, large cabin Global 7000 and Global 8000 aircraft and the CF34 engine which powers Challenger 600 series and Challenger 800 series aircraft.

Dassault Falcon revealed plans to open a Satellite Service Station at West Palm Beach Airport (KPBI) in Florida. The facility is expected to start in January 2012. Once operational, it will be capable of line service up through 4A+ checks on the Falcon 50/50EX, Falcon 2000 family, Falcon 900 family and Falcon 7X aircraft. A Falcon AOG 'GoTeam' will also be located at the facility. It provides rapid mobile response directly to an aircraft location with the parts, tooling and personnel necessary to get an operator's Falcon flying with minimal delay. The facility will have about $5,00,000 (₹2.25 crore) in tooling, equipment and Falcon spares in addition to a hangar, shop and offices for employees and customers.

SuperJet International, the joint venture between Alenia Aeronautica, a Finmeccanica Company, and Sukhoi Holding, has announced purchase agreement for two Sukhoi Business Jet (SBJ) aircraft plus two additional options, with Comlux. With this order, Comlux becomes the launching customer of SuperJet International for this new type of VIP aircraft. Comlux represents one of the most innovative business aviation groups worldwide, able to always offer to its VIP passengers new products for their travel needs. The deliveries of the two SBJ aircraft are planned for 2014. The order has an estimated value of $200 million (₹900 crore), including options. Before the entry into service, the VIP cabin interior of the aircraft will be designed and outfitted by Comlux America, the completion centre of the Comlux Group, based in Indianapolis USA. Comlux America is appointed as the first approved Sukhoi business jet completion centre.

Nextant Aerospace, the maker of 400XT, the world's first completely remanufactured business jet, displayed the 400XT at the NBAA annual meet.

IDAIR, the joint venture between Lufthansa Technik AG and Panasonic Avionics Corporation, brought its global communications solution to the VIP and business jet market. And the first installations on VIP aircraft have commenced, which are due for customer redelivery in 2012. The system provides customers with connectivity, global television channels, VPN – corporate e-mail and data access, mobile telephone and data services and in-seat telephone via VIP services, utilising infrastructure powered by Panasonic Avionics Corporation.

OnAir and Eclipse announced at NBAA that Eclipse has been appointed as a reseller of OnAir's new light-weight airborne connectivity solution. Industry leader OnAir selected Eclipse as a partner because of Eclipse's extensive provisioning of satellite hardware and services to the aviation market for the past 15 years. SP

Bob Smith, VP and Chief Technology Officer (Engineering & Technology), Honeywell

Kapil Kaul, Chief Executive Officer, Centre for Asia Pacific Aviation (CAPA)

SOARING HIGHER

The seminar "Indian Civil Aviation—Long Term Perspective" held at New Delhi, focused on the three key areas of airspace design, management and modernisation, airport development, operational airline economics and general aviation

BY **PRAKASH CHANDRA**

A DAY-LONG SEMINAR, "INDIAN CIVIL Aviation—Long Term Perspective", was held at New Delhi on September 19, 2011. Organised by the Indo-American Chamber of Commerce (IACC), with SP Guide Publications as media partner, the seminar brought together representatives from the US and Indian civil aviation sectors and allied industries who exchanged notes on the challenges and opportunities before India's civil aviation sector, which marks its centenary this year.

The seminar focused on the three key areas of airspace design, management, and modernisation; airport development; operational airline economics; and general aviation. V. Somasundaram, member, Air Navigation Systems, Airports Authority of India (AAI), Alok Sinha, Joint Secretary, Ministry of Civil Aviation, Kapil Kaul, Chief Executive Officer, Centre for Asia Pacific Aviation (CAPA), and Wing Commander B.S. Singh Deo, Managing Director, Bell Helicopter India, chaired the three sessions respectively.

Welcoming the delegates, Atul Sharma, Regional President of IACC said, "Seminars like this provide an excellent platform for identifying a roadmap for tapping the immense potential for growth in India's civil aviation sector." He praised "the tenacity of air carriers who gamely fly on, in spite of losing money in their operations." Private-public partnerships are the need of the hour to help build Greenfield and Brownfield airports, noted Sharma.

In his opening address, V.P. Agrawal, Chairman, AAI, gave a comprehensive overview of civil aviation in the country. The AAI provides air traffic services in Indian airspace and the oceanic airspace delegated to India by the International Civil Aviation Organisation (ICAO). "To cope with the recent unprecedented growth of traffic and meet the growing demand," he said that India is taking several measures to augment the communications, navigation and surveillance (CNS)/air traffic management (ATM) infrastructure and various airspace capacity enhancement programmes. "These include simplified coordination and communication, achieving fewer operational positions through airspace redesign, and simplified ATM processes." Special efforts like the US-India Aviation Cooperation Programme, he said, would give impetus to the overall growth of the industry in the country.

The passenger growth in India's civil aviation sector is cruising at over 20 per cent, which is among the highest in the world. At this rate, it will soon leave behind passenger growth of countries like China, France and Australia and touch 400 million before this decade is out. In fact, an estimated 240 million travellers are expected to transit through the country in 2015. And considering that more than 70 per cent of international travel is through airports, the development of world class airports is a key driver of growth. "Reason enough," said Agrawal, "for India to make better use of its 115 airports, of which only 84 are currently active." But the statistics, though impressive, only tell part of the story. For regulation is a tricky realm. "We should try to have insurable liability situations nationally and internationally, so that issues like bird-hits and on-approach incidents could be better addressed. The effort should be to chart growth with a long-term perspective, even though initially we may have been caught napping by the sudden spurt in the growth of the sector." It is just as well that the 12th

PHOTOGRAPHS: IACC

Wg Cdr Singh Deo chairing session on General Aviation

Robert A. Wilson, President, Business and General Aviation at Honeywell

Five Year Plan has apportioned $13 billion (₹58,500 crore) for the aviation sector. "With an active Greenfield airport policy, we are on our way to becoming the fourth largest player in civil aviation after the US, China, and Japan." Helicopters, too, have a major role here, he said. "It is important to build heliports at key locations to facilitate better connectivity, particularly in times of crisis, for instance, when helicopter-ambulances are urgently needed."

For a strategic player in global aviation like India, air traffic management (ATM) is a critical requirement, and streamlining air traffic flow management (ATFM), he said, is important to make optimum use of airspace and airports. "Currently, 35 per cent of airspace in India is reserved for defence purposes; land-based facilities in this regard would be closer to 60 per cent." The terrestrial navigational aids currently used in the country are non-directional beacon (NDB), distance measuring equipment (DME) and instrument landing system (ILS). Improvements in navigation include capabilities such as area navigation (RNAV) and global navigation satellite systems (GNSS) that provide worldwide navigation coverage and are already being used for global en route navigation and non-precision approaches. Once augmented or upgraded, these systems will support most precision approaches. When the geo-augmented navigation system (GAGAN) – being implemented jointly with the Indian Space Research Organisation (ISRO) – becomes operational in June 2013, it will be possible to have Category II and Category III facilities at many airports. Such an all-weather global navigation system would help in reaching a situation where airliners do not have to circle endlessly in the holding pattern, waiting for landing clearance from ATC. If there is any delay, it should be before the take-off.

Bob Smith, Vice President and Chief Technology Officer (Engineering & Technology), Honeywell, echoed similar views and observed that original equipment manufacturers (OEMs), including Boeing and Airbus, are becoming major players in the regional aviation sector. "So it will become inevitable for ATM systems to be streamlined. Several technologies are coming off the drawing board and all of them essentially offer integrated solutions to help make ATM operations smoother and more efficient." The long-term forecast for India from 2015 to 2025, he said, indicates that growth in aviation could double in the next five years. "By 2030, however, this growth could treble, making India the third largest aviation hub in the world, after the US and China. This entails tremendous economic value and invests upon all of us the responsibility of ensuring that we secure the type of growth we want, and the type of future we want, for a global aerospace player." Honeywell could play a key role in helping this transformation. "Being listed as the largest systems provider in the world is only a part of this," he said, recalling Honeywell's quarter-century-old collaboration with the Hindustan Aeronautics Limited (HAL). "Our effort is to transform the current cycle of this collaboration (with HAL) into a super-cycle of development."

Delegates stressed the importance of looking anew at cargo movement in a new light, given the fact that high value cargo fuels economic growth. Seminar participants were treated to a perspective view of "Airports in Progress", a remarkable slide show of airports that are being upgraded. Once completed, their stunning designs and the state-of-the-art passenger facilities would make airports like Chennai, Cochin, Thiruvananthapuram, Jaipur, Udaipur, Mangalore, Amritsar, Srinagar, Calicut, and Bhopal buzzing hubs of aviation activity, comparable to the best in the world. The delegates concurred that a lot depends on the way the industry chooses to respond to constraints like emissions trading schemes and other structural factors that prevent the growth of the sector.

Robert A. Wilson, President, Business and General Aviation at Honeywell, observed that general aviation maintenance repair and overhaul (MROs) have a crucial role to play in boosting the growth of the sector by offering integrated solutions "of the tip-to-tail" type. Noting that currently there are no major MROs within five hours' flying time from India, he predicted that MROs for fixed-wing aircraft, including turboprops, would register a growth of well over 10 per cent by 2016. Modification of electronics and avionics is currently registering the fastest growth (9.4 per cent) while the components are not far behind at eight per cent. To meet this growth, MROs should reckon with the accompanying heightened expectations of customers who would want "24/7 support." "Regulatory challenges would include stocking up on spares and hub optimisation."

Sorin-Dan Onitiu, Aero Engineering Manager, Government and Industry Affairs at Jeppesen (a subsidiary of Boeing Commercial Aviation Services), presented a bird's-eye view of the history of air traffic growth in the world in general, and in India, in particular. "Switching from an analog era to a digital one has had its problems," he said. "But I must say the industry has responded well, and today we are in a position to achieve unprecedented growth in civil aviation." SP

LOW-COST EXIT

The message is clear that full service and low-cost carrier are unlikely to coexist and prosper when operated by one airline under a common banner and brand

THE SUDDEN DECISION BY Kingfisher Airlines, announced end September 2011 to cease operations of Kingfisher Red, its low-cost arm, has been received with a sense of dismay and surprise by air travellers in India. Kingfisher Red was originally Air Deccan with which Captain G.R. Gopinath, in a pioneering effort, introduced the low-cost carrier (LCC) concept in August 2003. A "no frills service" model cloned from the West was eminently successful in India as it genuinely brought air travel from the confines of the elitist domain to within the affordable reach of the common man. The success of Air Deccan triggered a revolution in the airline industry in India with three new LCCs—IndiGo, SpiceJet and GoAir emerging on the scene soon after and proving to be highly successful. Meanwhile, Kingfisher Airlines bought Air Deccan four years ago to operate as its low-cost model under the Kingfisher brand and Jet Airways took charge of Air Sahara, which was rechristened as JetLite, the low-cost arm of the full service carrier (FSC) Jet. Air India, quite immune to the dynamics of the industry, remained without a low cost subsidiary.

The announcement by Kingfisher was followed by a press bulletin in which the airline clarified that in a few months, Kingfisher Red flights would be converted to "full service". The airline was no longer interested in competing in the low-cost regime as their full service segment was more than adequately subscribed to and was generating relatively higher yields. Kingfisher Airlines currently offers three levels of service, Kingfisher First (business class), Kingfisher Class Economy and Kingfisher Red no frills economy. As a consequence of the recent decision, Kingfisher Airlines will be left with two full service models.

While from the point of view of the airline industry, the decision appears to run counter to the démarche in favour of the low-cost concept, Kingfisher's decision was seen as a disconcerting signal by the public as such a move by this premier airline could lead (or mislead) other LCCs to recast their business models. There was a lurking possibility and consequent apprehension that the spirit of the low-cost revolution in the airline industry could be severely dampened or even reversed. Air travel could once again become a fading dream for the middle class.

The fact that a highly reputed airline like Kingfisher, winner of several national and international awards, has not been able to manage the low-cost model is a contradiction that needs to be resolved. Whether FSC or LCC, for aircraft above 40 tonnes in weight and 80-seat capacity, there is no difference in the basic operating expenses. FSCs incur additional expenses on in-flight catering/entertainment, lounge facilities and rewards which compared to the basic expenses, are marginal. Over the last few years, there has been sizeable expansion of LCC fleets with supply outstripping demand. The net result is a price war and lower yields. With five airlines operating in the low-cost segment as compared with three in the full service segment, the competition amongst the LCCs is far more intense than amongst the FSCs. Meanwhile, driven by a resurgent economy, there has been a spurt in the demand for business-related travel pushing up load factors of FSCs. For Kingfisher Airlines particularly, load factors on full service flights have been consistently high. However, the low-cost arm has suffered somewhat as finding its service being inconsistent with the expectations of brand name; passengers tend to migrate to Kingfisher's full service, thus adversely affecting the load factors and yields of Kingfisher Red. This is a strange and unexpected conflict amongst the two arms operated by the same airline and is mutually injurious to each other's well being. In the experience of Kingfisher Airlines, the business travel segment has been more easily sustainable than the highly price sensitive low-cost segment.

But perhaps the most complex issue relates to management of two separate models, FSC and LCC, within one airline. Operating paradigms and cultures of the two models are vastly different creating its own set of problems with regard to uniformity in staff training, standard operating procedures, costs and most importantly, branding. As an FSC like Kingfisher Airlines would have found it somewhat incongruous to market its low-cost brand while the parent company and its full service brand exuding a five-star culture, was targeting high end clientele. Despite the fact that at the outset the management of Kingfisher Airlines had little belief in the low-cost concept in 2007, the Airlines moved aggressively to acquire Air Deccan. However, after four years of operation, its worst fears have come true.

Finally, the message to the industry is clear that full service and low-cost carrier are unlikely to coexist and prosper when operated by one airline under a common banner and brand. SP

—AIR MARSHAL (RETD) B.K. PANDEY

PHOTOGRAPH: SP Guide Pubns

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