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COVER IMAGE:

Business aviation sector accounts for over \$20 billion to the European economy and employs more than 1,60,000 people across Europe.

Cover image by: Bombardier



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EUROPE: TRENDING UPWARD

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SUBSCRIPTION/ CIRCULATION

Annual Inland: ₹1200 • Foreign: US\$ 320

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A CONDUCTIVE ENVIRONMENT AND INDUSTRY-FRIENDLY POLICIES WILL SPUR BUSINESS AVIATION TO GREATER HEIGHTS

THE GOOD NEWS IS that business aviation is looking up. It may take a while for the segment to soar really high, but the signs of upward trend are clear. And one cannot disbelieve what an aviation analyst has said – that the next 10 years would be better than the prior 10 and in fact that it will be the best years' business aviation has ever experienced, driven by large-scale globalisation.

Two events – the Asian Business Aviation Conference and Exhibition (ABACE 2014), which concluded recently, and the upcoming European Business Aviation Conference and Exhibition (EBACE 2014) in Geneva – are barometers of the trends in business aviation. The second edition of ABACE in Shanghai has proved beyond doubt that the Asian giant – China – is waking up to aviation, particularly business aviation. R. Chandrakanth in the ABACE show report has indicated that with the opening up of the economy, the segment is expected to flourish.

So are other countries in the region, including India which has enormous potential, but is strapped by regulations, policy paralysis and the perception that business aviation is a rich man's toy. It is hoped that the new government will create an ecosystem for business aviation to flourish. The Bharatiya Janata Party's Prime Ministerial candidate, Narendra Modi, criss-crossed the nation in an Embraer jet for his election campaign. There can be no better testimony than this of how business aviation can be effective, not just in an election campaign.

Presently, the sector is fighting for survival and the Business Aviation Operators Association (BAOA) is locked in a battle with the Directorate General of Civil Aviation for the onslaught against business aviation operators. What India needs post-haste is a conducive environment and industry-friendly policies which will not only spur business aviation, but also have a cascading effect on the economy.

In this issue, Rick Adams, our contributor from Europe, has done some crystal-gazing on European business aviation and how it will recover soon, though it may lag the modest global market recovery. He has spoken to various experts on behalf of *SP's Aviation* to get the pulse of the European business aviation sector.

Moving from business aviation, closer home, the nation awaits with anticipation mixed with a degree of apprehension for the new government to take charge at the centre and begin to deliver. The Indian Air Force (IAF) too is looking forward to

the new incumbents turning their attention to the long overdue revival of its fleet of combat aircraft. The overall scenario in the IAF today is not inspiring at all. The plans of the IAF to add new teeth with advanced weapon systems and avionics to its ageing fleet of Jaguar combat aircraft appear to have hit a roadblock on account of certain design and development issues.

But the most debilitating factor for the IAF is the inordinate delay in the award of contract for the 126 medium multi-role combat aircraft. The Rafale from Dassault Aviation of France was selected more than two years ago but the contract negotiations are yet to be completed. In this issue Air Marshal B.K. Pandey traces the long and enduring partnership that has been built up over the last six decades between the IAF and Dassault Aviation. Hopefully this partnership will be strengthened further with the induction of the Rafale.

Reviewing the market potential for unmanned aerial vehicles in India, Joseph Noronha believes that India can catch up with the developed countries in this regard, provided there is substantial investment and determination.

Writing on Regional Aviation, R. Chandrakanth delves into the subject of Jets vs Turboprop, a debate that is never ending. He also focuses on the critical importance for regional carriers to get the size of the aircraft right for the market they operate in.

All these apart from the regular features. Welcome aboard and happy landings!

JAYANT BARANWAL

PUBLISHER & EDITOR-IN-CHIEF



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NEWS:

AIRASIA INDIA GRANTED AIR OPERATOR'S PERMIT

The Directorate General of Civil Aviation (DGCA) has granted an Air Operator's Permit (AOP) to AirAsia, paving the way for the airline to launch low-cost services in the country. AirAsia India, a joint venture among Malaysia's AirAsia Berhad, Tata Sons and Telestra Tradeplace, is to launch services from its Chennai hub with three Airbus A320 aircraft. Chief Executive Mittu



Chandilya said his team was finalising flight schedules. Though the DGCA rules will require AirAsia to have a fleet of five aircraft within a year of starting operations, the airline plans to have 10 planes by that time. Chandilya said AirAsia's fares would be 30 per cent lower than rivals. "We will be competing with the railways and not other airlines."

VIEWS:

IF THERE IS ANY area in which the Indian bureaucracy has maintained remarkable consistency, it is in the excruciatingly tardy pace at which projects related to new ventures in areas of economic activity are processed. And the civil aviation industry is no exception. The joint venture project AirAsia India was initiated on February 20, 2013, and the date for the launch was set for December 2013. The proposal was cleared by the Foreign Investment Promotion Board in just 14 days time, a record of sorts indeed! However, the no objection certificate from the Civil Aviation Ministry could be obtained only six months later on September 20. Thereafter, the promoters approached DGCA for AOP. But there were a number of roadblocks ahead.

But what is somewhat intriguing is that it has taken 15 months for the airline to obtain AOP. This tardy approach by the bureaucracy, apart from being both inexplicable and unacceptable, is afflicting the venture despite the fact that it is patronised by the Tatas, the doyen of the private sector, pioneer in civil aviation and capable of influencing the decision-making process of the Central Government.

The first impediment was the interpretation of the newly introduced regulations on Foreign Direct Investment (FDI) by foreign airlines in Indian carriers which was limited to 49 per cent. The argument against the proposal for the joint venture AirAsia India was that FDI by a foreign carrier was meant only for existing airlines and not for new ventures. The Federation of Indian Airlines (FIA) filed an appeal in the Delhi High Court against the grant of permit to AirAsia India in response to which the Court issued notice to the government. The Secretary, Ministry of Civil Aviation, Ashok Lavasa took a stand stating that the government would not respond on the basis of individual interpretations and hold back the launch of AirAsia India merely on account of opposition from rivals which was only to be expected.

In the meantime, the DGCA constituted a three-member committee to look into the issues related to the new joint venture airlines. While on their recommendations the government overruled objections to the establishment of AirAsia India, the problem was not solved as a fresh petition was filed by BJP leader Subramanian Swamy. Queries from some quarters about

the ownership and effective control was also set aside by the committee observing that "Such ventures were necessary for a large country like India as there was imperative need for encouraging existing airlines as well as allowing new entrants for optimum availability of services and improved connectivity at affordable tariffs". The committee observed that it was "necessary to bring operational efficiency and expertise in the existing airlines to ease their financial hardship which could only be achieved through enhanced competition and improved work culture, attributes that can be provided by new entrants".

While grant of AOP to the budding venture is exciting news not only for the Malaysian carrier but also for the travelling public who can look forward to qualitative change in the low-cost services in terms of standards and affordable fares. But it is premature to celebrate as the entrepreneur is yet to negotiate a legal hurdle. The grant of AOP at this point in time is conditional as it is subject to the decision of the Court on the petition by Swamy. The hearing is on July 11, 2014.

If the decision of the Delhi High Court is unfavourable, the government may well approach the Supreme Court. Meanwhile, Swamy and the FIA are planning to move the Delhi High Court against the grant of AOP. As the legal system in India is not particularly known for speedy resolution of cases, this case too may drag on and hence the precise date of launch remains somewhat uncertain. However, optimism prevails as AirAsia is going ahead with the preparatory work for the launch. AirAsia is inspired by the support it has received from the government and expects a favourable ruling by the Court. Soon after the AOP was granted, AirAsia Chief Tony Fernandes, tweeted, "History has been made today in aviation. Everything has been hard for AirAsia but we never give up".

Entry of AirAsia India will definitely intensify competition in the domestic aviation market wherein the airlines have been struggling to survive. News of entry of AirAsia India as also of Tata-SIA would have certainly driven a chill up the collective spine of the Indian carriers who can no longer bask in the protective comfort behind artificially created firewalls! SP

—By Air Marshal (Retd) B.K. Pandey



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IS IT A DRONE OR A SATELLITE?

The StratoBus offers long endurance and complete autonomy from a fixed position

WITH UAVS CROWDING NAVIGABLE airspace and plans underway to put giant mega-satellites into orbit, it was just a matter of time before a drone-satellite hybrid was developed to fit between the two spaces. StratoBus, a new project out of France, is conceptualised to do just that. Designed to be about the length of a football field and 25 yards in diameter, the blimp-shaped vehicle's shell will be made of carbon fibre.

Without a launcher, StratoBus floats to the lower stratosphere at an altitude of about 21 km where developers say it will be in a perfect position to carry out a range of functions, including surveillance, border security monitoring, communications reinforcement and facilitating navigation, all from a stationary position with the help of two self-adjusting electric motors. StratoBus will be able to endure missions of up to a year with a total lifetime of five years.

The ultra-lightweight design allows for a plug-and-play pay-

load on the nacelle that can accommodate up to 450 pounds. And because the drone-tellite stays closer to earth, it will be able to take higher resolution images and maintain a stronger communications system. It might even be used to boost GSM network capacity during high traffic periods.

StratoBus will have a state-of-the-art solar power system with panels that rotate to maximise sun access coupled with a power amplification system to handle any surges in expended power. The StratoBus project is led by Thales Alenia Space with Airbus Defence & Space, Zodiac Marine and CEA-Liten, who say they expect the first prototype within five years. SP

PHOTOGRAPH: THALES



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DRDO'S LAKSHYA-1: HIGH-SPEED PILOTLESS TARGET AIRCRAFT

A LONG FLIGHT TO UNMANNED INDEPENDENCE

India's market for UAVs is potentially huge and a number of private firms seem eager to participate in development and production of new machines

BY JOSEPH NORONHA

PHOTOGRAPHS: SP GUIDE PUBNS



(LEFT) NETRA LIGHTWEIGHT, AUTONOMOUS MINI-UAV MEANT FOR SURVEILLANCE AND RECONNAISSANCE; (RIGHT) NISHANT UAV WILL BE INDUCTED FOR MILITARY USE

UNMANNED AERIAL VEHICLES (UAVS) are rapidly becoming the futuristic devices to watch. They are employed in a variety of military roles and their civilian use is also on the rise. Following the spectacular success of US and Israeli unmanned missions, militaries across the globe are eagerly adding these useful “toys” to their arsenals. The Indian armed forces too have long appreciated the worth of UAVs, but acquisition plans have lagged. Most systems currently available are procured from Israel. Last year the country ordered 15 Heron medium altitude long endurance (MALE) UAVs manufactured by Israel Aerospace Industries (IAI), to add to the 25 existing such systems that are being upgraded with better communication equipment and sensors. The three services also have around 100 Israeli Searcher II tactical surveillance UAVs.

India's market for UAVs is potentially huge and a number of private firms seem eager to participate in development and production of new machines. Apart from subassemblies, major subsystems like sensors and engines are already being obtained from private suppliers. However, it is the public sector Defence Research and Development Organisation (DRDO) and its key aeronautical systems design house, the Aeronautical Development Establishment (ADE), that are in the forefront of efforts to develop indigenous military UAV capability.

EYE-IN-THE-SKY NETRA

Netra, for instance, is a lightweight, autonomous mini-UAV meant for surveillance and reconnaissance. It was jointly developed by DRDO's ADE and ideaForge, a Mumbai-based private company. It is made of carbon fibre composites. Since it weighs just 1.5 kg, it is portable enough to be carried in a backpack. It requires hardly any maintenance because it has no moving parts except rotors, motors and transmissions. It has quadruple rotors that provide vertical take-off and landing (VTOL) capability and control. Once launched, it can climb to its operating altitude of 200 metres to 300 metres and fly a distance of about 2.5 km from the take-off point.

Netra is electrically powered and a single charge keeps it airborne for about 30 minutes. Its flight and navigation is controlled by an onboard autopilot with the help of anti-collision sensors. It automatically flies to the location specified on the ground. It can carry out surveillance at a distance of about 1.5 km line of light (LOS), using a high resolution CCD camera with pan/tilt and

zoom features to enable wider coverage. It can also carry a thermal camera for night operations. However, it cannot operate in rain. In case of loss of communication or if the battery is running low, Netra automatically returns to its launch position. It has been inducted by the Central Reserve Police Force (CRPF) and other paramilitary and police forces in the country.

AIRBORNE AT DAWN: NISHANT

Nishant is another ADE-designed UAV for military use. Its primary roles are intelligence, reconnaissance, training, surveillance, target designation, artillery fire correction, damage assessment and Electronic and Signals Intelligence (ELINT/SIGINT). It is rail-launched from a hydro-pneumatic launcher and recovered by parachute, thus eliminating the need for a runway. The Nishant weighs 380 kg and with a cruising speed of 125 to 150 kmph, it has an operational range of 160 km and can remain airborne for four-and-a-half hours. Its service ceiling is 3,600 metres. The Nishant has completed the development phase as well as user trials and is under induction by the Indian Army.

REMARKABLE RUSTOM

But the Rustom UAV is where DRDO/ADE may enter the big league later this year. The Rustom is a family of UAVs that is intended to be the mainstay of the three services, supplementing or even replacing the imported Heron.

The Rustom story began in the 1980s when a team from the National Aerospace Laboratories (NAL), India's second largest aerospace firm, under the leadership of Professor Rustom Damania, developed the Light Canard Research Aircraft (LCRA). The LCRA was inspired by Burt Rutan's Model 61 Long-EZ, a home-built aircraft with a canard plan form. The first model to emerge was the Rustom-I, an all-composite tactical surveillance UAV, based on the LCRA. It is designed for reconnaissance, surveillance, target acquisition and designation, communications relay, battle damage assessment and ELINT/SIGINT. It is powered by a single 160 horsepower Lycoming engine and may have an endurance of up to 12 hours. The aircraft cruises at 80 to 100 knots and has a maximum speed of 190 knots. It is designed to be externally piloted but may also feature autonomous take-off and landing. It has completed over 30 test flights. The DRDO is currently embarked on producing ten such systems at a cost of

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about \$350 million, with production slated to be completed by 2017. If all goes well, the Rustom-I may soon be able to carry the Helina missile, the air-launched version of the Nag anti-tank missile. This would make the Rustom-I India's first armed UAV.

The Rustom-H is a larger MALE surveillance UAV, with a much higher range and service ceiling as compared to Rustom-I. It has two engines and an endurance of over 24 hours. It bears no resemblance to the Rustom-I. However, the DRDO's main near-term hope for unmanned glory rests on the Rustom-II, a MALE UAV. Its initial role will be surveillance but it will ultimately morph into an unmanned combat air vehicle (UCAV), similar to the American Predator, with a great deal of mission flexibility. It has a conventional undercarriage and needs a runway for take-off and landing. It has a wingspan of 21 metres, a potential endurance of 24 to 30 hours and a payload of 350 kg. It has a ceiling of almost ten km. The DRDO is aiming for a world-class system that can perform various roles like intelligence gathering, border surveillance, target information and communications. The UAV is designed to carry a variety of optical and electronic sensors and each of the three services may get a configuration most suited to its needs. An indigenous Ku-band synthetic aperture radar (SAR) is to commence flight trials shortly. Rustom-II, however, has suffered from lack of access to technology for sensors and engines and is running a little behind schedule. Its first flight is now expected in the next few months, probably this year and it is expected to be ready for induction by 2017.

CREATING AN AURA

Preliminary work has also begun on the Indian unmanned strike air vehicle (IUSAV) earlier known as autonomous unmanned research aircraft (AURA). The IUSAV will be a stealthy system, capable of internal carriage and release of precision-guided munitions (PGMs). This programme is classified and is still in its project definition stage. It will be a flying wing design, built mainly with composites and will have radar absorbent paint, serpentine air intakes and turbofan engines. A non-afterburning derivative of the long-delayed GTRE Kaveri is mentioned as its likely powerplant. The IUSAV will also have encrypted data-link and advanced sensors. Dassault Aviation, Saab and BAE Systems are potential partners in this extremely complex and ambitious programme. The ADE is working towards its maiden flight in 2015-16 and first deliveries by 2020.

FLYING TO THE FUTURE

Apart from the models mentioned above, DRDO's Lakshya-1 high-speed pilotless target aircraft has been in use by the defence services for many years. Now



RUSTOM-II WILL ULTIMATELY MORPH INTO AN UCAV, SIMILAR TO THE AMERICAN PREDATOR, WITH A GREAT DEAL OF MISSION FLEXIBILITY

an improved version Lakshya-2, capable of flying in sea-skimming mode at a height of about 15 metres and at treetop level over land, is ready for induction. The DRDO is also developing a low-cost expendable aerial target system known as Abhyas.

Indeed, the DRDO is working on a range of unmanned aircraft and they are in various stages of development from the design concept onwards. Among them, there is the short-range Pawan, the Gagan tactical UAV and a Naval Rotary UAV (NRUAV), being developed in collaboration with IAI. The NRUAV is an intelligence, surveillance and reconnaissance

(ISR) UAV, based on a Chetak helicopter platform, which can loiter for about six hours at a distance of 120 km from the launch ship. Also on the cards is a solar-powered UAV that can remain airborne for as long as 15 days. Then there's the NAL SlyBird hand launched mini-unmanned air vehicle (MAV) as well as a national competition for micro air vehicles (MICAV), part of the ₹100-crore national programme on MICAV to be held for the second time this year.

UAV operators the world over are beginning to realise that the best results come from first-rate sensors and that the cost of sensors may equal the cost of the UAV itself. Light, compact and powerful sensors are necessary to equip smaller UAVs to perform almost as well as the larger ones. Militaries with growing UAV fleets are also facing shortages of skilled UAV operators. It would help if India's three services set up a joint training centre where specially selected trainees can be introduced to UAVs.

India's UAV needs are large and growing. There is already a demand-supply imbalance. The Indian Army alone reportedly has plans to acquire about 1,500 systems over the next three or four years, ranging from mini and micro systems to MALE and HALE (high altitude) UAVs. Small UAVs are particularly useful to provide commanders a bird's-eye view of the battlefield so they can move their troops into the fight with authentic information of the enemy's location, capability and intentions. The Indian Air Force and Indian Navy also need MALE and HALE surveillance UAVs and UCAVs. In addition, the Indian Navy would prefer to have rotary UAVs that can be launched and recovered even from small ships.

The DRDO and other agencies need to speed up efforts to prevent the country becoming permanently dependent on foreign suppliers of UAVs. However, the public sector's track record in designing, developing and producing modern aircraft and weapon systems of cutting-edge technology is hardly inspiring, with several current programmes being high on promise and low on delivery. But when it comes to UAVs, the gap with the advanced countries is not so great that it cannot be bridged. All it needs is adequate levels of investment, determination and effort. With these, one can hope that the DRDO would be able to deliver. **SP**

**THE INDIAN ARMY ALONE
REPORTEDLY HAS PLANS
TO ACQUIRE ABOUT 1,500
SYSTEMS OVER THE NEXT
THREE OR FOUR YEARS.**

RELATIONSHIP BOOSTER:
THE LONG AWAITED RAFALE INDUCTION
IN THE INDIAN AIR FORCE WILL TAKE
THE RELATIONSHIP BETWEEN THE TWO
(THE COMPANY AND THE USER) TO
NEXT LEVELS



ALONG JOURNEY

The relationship that the Indian Air Force has forged with Dassault Aviation over the last six decades will facilitate the fulfilment of needs of the IAF in the future

BY AIR MARSHAL (RETD) B.K. PANDEY

PHOTOGRAPH: DASSAULT AVIATION

THE HISTORY OF RELATIONSHIP between India and France dates back nearly 400 years to the days of the Mughal Empire. Later on in the 18th century, France was actively involved militarily in several military campaigns in South India generally fighting the British. Apart from Great Britain, France was one of the major European nations to establish colonies in India. On India gaining independence in 1947, diplomatic relations between the two nations were formally established and over the years, France and India have had close and friendly relations. The two nations have even entered into a strategic partnership

in 1998 leading to exchanges in strategic areas such as defence, nuclear energy and space. France was one of the few nations that did not condemn India's nuclear tests in 1998 and has supported India's bid for permanent membership of the UN Security Council as well as G-8. France is one of the largest suppliers of nuclear fuel to India and has entered into an agreement for civil nuclear cooperation.

EARLY YEARS OF PARTNERSHIP IN MILITARY AVIATION

While the two nations built up enduring relationships over

the years, the foundations of ties in the regime of military aviation between India and France were laid in 1953 when the Indian Air Force (IAF) placed an order on the French aerospace major Dassault Aviation for of 104 Ouragan jet fighters that were renamed as the "Toofani" by the IAF. This was the first export contract ever for Dassault Aviation. The Toofani fighter aircraft of the IAF saw action in 1961 when they carried out air strikes against the Portuguese in Diu on the west coast of India. They were also used in ground attack missions against the rebels in Assam and Nagaland and in 1962 were employed for reconnaissance missions in the Sino-Indian conflict of 1962. The Toofani fleet was withdrawn from front line service in 1965.

In 1957, the IAF procured from Dassault Aviation over 100 of their latest and more powerful combat aircraft, the Mystère IV-A. This fleet served to significantly enhance the operational potential of the IAF and acquitted itself admirably well in the Indo-Pak war of 1971.

INDUCTION OF THIRD GENERATION COMBAT AIRCRAFT

In 1978, the Dassault-Breguet/BAC Jaguar deep penetration strike aircraft was selected for induction into the IAF. With 40 platforms delivered directly by the manufacturers in a flyaway condition beginning in 1981, the remaining 120 were built under licence in India by the Indian aerospace major Hindustan Aeronautics Limited (HAL). The Jaguar has been described as one of the few aircraft capable of the nuclear strike role but the IAF has not adopted this option. The Jaguar fleet of the IAF was employed for reconnaissance missions in support of the Indian

THE FOUNDATION OF TIES IN THE REGIME OF MILITARY AVIATION BETWEEN INDIA AND FRANCE WERE LAID IN 1953

Peace Keeping Force in Sri Lanka in the period 1987 to 1990. The fleet also played an active role in the war with Pakistan in Kargil in 1999, dropping both unguided and laser-guided bombs. Equipped with the Sea Eagle missile, Jaguars of the IAF are also employed in the maritime strike role. This fleet has proved to be a strong element of the IAF.

The fleet of 125 Jaguar aircraft now remaining in service with the IAF are being upgraded with better avionics

including multi-mode radar, autopilot and other changes as part of the DARIN III programme. Also under consideration is fitment of engines with higher thrust rating to enhance performance of the aircraft particularly at medium altitudes.

In 1985, the IAF received 49 Mirage 2000H, the latest, state-of-the-art combat aircraft of the time designed, developed and produced by Dassault Aviation. In 2004, the Indian Government approved purchase of ten Mirage 2000H aircraft, an improved version featuring better avionics including an upgraded RDM 7 radar. The Mirage fleet rendered yeoman service during the Kargil war in 1999 and performed remarkably well during the entire conflict in the high Himalayan Mountains. The fleet had been modified by the company on an emergency basis to deliver laser guided precisions weapons against targets in the Kargil sector. Ease of maintenance, excellent product support, high reliability and a very high sortie rate made the Mirage 2000 fleet clearly the most efficient amongst the different fleets of combat aircraft in the IAF. For many years they have been highly regarded in the IAF, being a stable weapons platform with a respectable safety record. The Mirage 2000 fleet has also been assigned the nuclear strike role.

MILESTONES

The IAF places an order for 104 Ouragan jet fighters, reamed as "Toofani" by the IAF.



Toofanis carry out air strikes against the Portuguese in Diu.

The Toofani fleet withdrawn from front line service.

1953

1957

1961

1962

1965

1971



The IAF procures over 100 of the latest and more powerful combat aircraft, the Mystère IV-A from Dassault Aviation.

Toofanis employed for reconnaissance missions in the Sino-Indian conflict.

The Mystère IV-A fleet employed effectively in the Indo-Pak War.

In March 2010, India and France finalised a programme with Dassault Aviation for a comprehensive upgrade of the Mirage 2000H to Mirage 2000-5 Mk 2 standard with the MBDA AIM-132 ASRAAM close combat missile, new radar systems, mission computers, a new weapon suite, electronic warfare system, helmet mounted sight, glass cockpit and upgraded data bus, etc. Thales and MBDA are participants in the upgrade programme. The first six aircraft are being upgraded in France, with the rest in India by HAL under transfer of technology. Under the upgrade, the entire airframe will be stripped down to be re-wired and re-equipped. This upgrade will significantly enhance operational capabilities of the Mirage 2000 fleet apart from extending the operational life of the multi-role fighters by around 20 to 25 years. The Mirage 2000 represents a long tradition of cooperation with Dassault Aviation initiated over six decades ago. In this period, the French aerospace major has delivered more than 7,500 civil and military aircraft to 75 countries.

MEDIUM MULTI-ROLE AIRCRAFT FOR THE IAF

During the early years of the last decade, the IAF initiated a case for the procurement of 126 combat aircraft to replace its ageing fleet of MiG-21 air defence fighters especially as time frame for the availability of the indigenously developed light combat aircraft Tejas was somewhat uncertain. At that point in time, the IAF did consider the option of induction of the Mirage 2000-5 in sufficient numbers to close the gap in the combat fleet. The IAF was happy with the performance of its Mirage 2000 fleet and viewed the option of reliance on Dassault Aviation as the

THE MIRAGE 2000 REPRESENTS A LONG TRADITION OF COOPERATION WITH DASSAULT AVIATION INITIATED OVER SIX DECADES AGO

most expedient and comforting. However, on account of compulsions of the newly introduced Defence Procurement Procedure as well as for some other considerations, the IAF had to resort to a global tender for a light-weight air defence aircraft. Against this requirement, Dassault Aviation had offered the newer version, the Mirage 2000-5 to compete for the contract against three other contenders. However, when the tender

document was revised to include medium multi-role combat aircraft (MMRCA), Dassault Aviation replaced the Mirage 2000-5 offer with that of the newly developed, most modern fighter aircraft, the Rafale, that undertook its maiden flight in July 1986 became operational with the French Air Force in 2006. In the revised tender, Dassault Aviation was now in a stiff competition against five of the leading global aerospace majors from the US, Russia and Europe.

The Dassault Rafale is a twin engine, canard delta-wing, multi-role fighter aircraft designed, development and built by Dassault Aviation. The aircraft is also described by the manufacturers as an omnirole fighter and is endowed with a high level of agility and is capable of simultaneously undertaking air supremacy, interdiction, reconnaissance and nuclear deterrent missions. As opposed to other combat platforms developed in Europe in that period, the Rafale has been built almost entirely by a single nation. The aircraft has been employed in combat successfully in air support roles over Afghanistan since 2007, played a major role in the NATO air campaign against Gaddafi's forces in Libya in 2011 and was deployed for air operations in Mali.

The Dassault-Breguet/BAC Jaguar deep penetration strike aircraft selected for induction into the IAF.



The IAF receives 49 Mirage 2000H from Dassault Aviation



1978

1981

1985

1987-1990

1999

With 40 platforms delivered directly by the manufacturers in a flyaway condition beginning in 1981, the remaining 120 were built under licence in India by the Indian aerospace major HAL.

The Jaguar fleet was employed for reconnaissance missions in support of the IPKF in Sri Lanka.

The Jaguar fleet played an active role in the war with Pakistan in Kargil in 1999, dropping both unguided and laser-guided bombs.

The Mirage fleet also rendered yeoman service during the Kargil War.



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PHOTOGRAPH: SP GUIDE PUBNS



MIRAGE 2000H, STATE-OF-THE-ART COMBAT AIRCRAFT DESIGNED, DEVELOPED AND PRODUCED BY DASSAULT AVIATION WAS INDUCTED IN IAF IN 1985

In February 2011, along with the other five competitors, Dassault Aviation demonstrated the Rafale at Aero India held at the IAF Station, Yelahanka on the outskirts of Bengaluru. On January 31, 2012 in five years after global tender was floated, the IAF finally declared the Rafale as the lowest bidder and technically the preferred option in the MMRCAs competition. Under the proposed contract, 18 aircraft would be supplied to the IAF by 2015 in flyaway condition, while the remaining 108 would be manufactured by HAL in India under transfer of technology agreement. The contract for 126 aircraft along with services and spares packages could be worth as much as \$20 billion or even more. The IAF also has an option for another 63 aircraft.

Unfortunately, over two years have gone by since the selection of the Dassault Rafale was made public, for one reason or another, negotiations have dragged on and the contract has not yet been concluded. It is now hoped that the new government that takes over in May 2014, will hasten the finalisation of negotiations and award the contract in the current financial year in order that the Rafale fleet is inducted into the IAF before the end of this decade.

PARTNERSHIP WITH THE INDIAN AEROSPACE INDUSTRY

In conformity with the terms of the RFP, while HAL will be the lead integrator for the aircraft to be manufactured in India, Dassault Aviation has selected Reliance Industries from the Indian private sector as a partner for the project and has plans to build production facilities in India similar to those in France. The involvement of Indian industry within the programme will consolidate existing ties with the French aerospace industry and will reinforce long-term cooperation in the regime of cutting-edge technologies.

Dassault Aviation and its partners, Snecma and Thales, organised as a joint venture, Rafale International, are committed to pursue this extraordinary long-standing cooperation with India and meet with the urgent requirements of the IAF. The relationship that the IAF has forged with Dassault Aviation over the last six decades, through mutual effort and cooperation, will facilitate the fulfilment of needs of the IAF in the future. Rafale International sees the MMRCAs programme not only as a financially rewarding contract but more importantly as an opportunity to further strengthen strategic partnership and industrial cooperation between the two nations. The programme is also backed by strong political commitment from the French Government to India in the regime of military cooperation. **SP**



7X SETS A NEW RECORD. FASTEST SELLING FALCON EVER.

In seven years since certification, more than 200 Falcon 7X aircraft have entered service, accumulating more than 250,000 hours in the air. Proving themselves around the world every day.

Fly with comfort. Fly with confidence. Fly anywhere.



EUROPE: TRENDING UPWARD

Business aviation in Europe continues to lag the modest global market recovery, but there are hopeful signs, says **Rick Adams** (our contributor from Europe). He spoke to EU market observers on the trends in business jet market.

PHOTOGRAPH: DASSAULT AVIATION

showed a four per cent increase in the number of business aircraft hours flown globally, higher than the 2.9 per cent GDP estimates by the International Monetary Fund.

By region, the JSSI analysis showed a 25 per cent jump in traffic in the Middle East and Africa, 22 per cent in Asia, and 12 per cent in Europe. The world's largest bizjet market, the United States, grew by about six per cent, which some attribute to anti-bizav rhetoric in recent years. Latin America was flat. Neil Book, JSSI President and CEO, said, "The global growth in flight hours is a positive indicator for the health of both the aviation industry and the economy as a whole."

Growth rates by aircraft category were similar: small cabin eight per cent, medium cabin five per cent, and large cabin seven per cent. The General Aviation Manufacturers Association said its members delivered 678 business jets in 2013, six jets more than 2012.

Hamburg-based aviation data firm WingX Advance said business aviation flying jumped 22 per cent in March 2014 compared with the previous year to nearly 53,000 flights. WingX said the increase was due both to private flight activity, up eight per cent (particularly business piston aircraft, which rose 28 per cent. For the still-struggling business jet fleet, activity was down 1.1 per cent and charter activity down 3.9 per cent.

Business aircraft flights rose in the UK, Italy and France, but declined in Germany, Turkey and Russia. For 2013, the bright spots included Spain, Ukraine and the Benelux countries. There was increased activity in flights headed to Europe from North America, the Middle East and Asia.

Roger Whyte, former senior executive with Cessna

Aircraft for nearly 30 years and now Chairman of the Central European Private Aviation Association, told *SP's Aviation* that "CEPA countries have outperformed those of the non-CEPA regions" since 2008, "whereas most other markets in Europe are still to recover." He cited Hungary, Slovenia, Slovakia, the Czech Republic, Poland, Bulgaria, Romania and even Ukraine as having increased activity (at least before the current political turmoil).

"The Central and Eastern European (CEE) market is developing well, even though all of its countries were hit by recession, causing a slowdown in the rate of development. The difference with these countries, compared to those in the west, is that they were better equipped to deal with recession and the change in the economy as their growth had previously been comparatively slower. The whole economy is now recovering and developing."

GROWTH SIGNS

"The business aviation market in Europe is now growing again," PrivateFly CEO Adam Twidell told *SP's Aviation*. "This growth is modest, but there are much more confident signs, and we are currently moving into summer, which seasonally is also the busiest time for Europe's fleet."

Twidell is an active private jet pilot, flying the Citation XLS, and a former UK Royal Air Force and NetJets pilot. Launched in 2007, PrivateFly claims to be the fastest-growing global booking service for private jet charter and private aircraft hire. They use websites and applications for iPhone, iPad, and Android devices to connect customers with a network of over 7,000 accredited aircraft, arranging charters within 90 minutes or less.

Twidell said the path to continued business aviation



STRONG REPRESENTATION:
DASSAULT'S FALCON 7X HAS BEEN ONE OF THE MOST
SUCCESSFUL JETS MAINTAINING LEADERSHIP FROM
EUROPE AND SELLING ACROSS THE CONTINENTS

BUSINESS AVIATION FLIGHT ACTIVITY world-wide grew faster than the global gross domestic product (GDP), and for the first time since 2008, deliveries of business jets were higher than the previous year. In Europe, flight activity was down slightly (two per cent) overall in 2013; however, there are signs of promise – after three consecutive monthly increases, activity in the first quarter edged up by 1.6 per cent from the same period a year ago. Jet Support Services Inc's (JSSI) annual year-end business aviation index



'THE GLOBAL GROWTH IN FLIGHT HOURS IS A POSITIVE INDICATOR FOR THE HEALTH OF BOTH THE AVIATION INDUSTRY AND THE ECONOMY AS A WHOLE'

—NEIL BOOK
JSSI PRESIDENT AND CEO



'THE CENTRAL AND EASTERN EUROPEAN MARKET IS DEVELOPING WELL, EVEN THOUGH ALL OF ITS COUNTRIES WERE HIT BY RECESSION, CAUSING A SLOWDOWN IN THE RATE OF DEVELOPMENT.'

—ROGER WHYTE, FORMER
SENIOR EXECUTIVE WITH
CESSNA AIRCRAFT



'THE BUSINESS AVIATION MARKET IN EUROPE IS NOW GROWING AGAIN. THIS GROWTH IS MODEST, BUT THERE ARE MUCH MORE CONFIDENT SIGNS.'

—ADAM TWIDELL
PRIVATEFLY CEO



'EACH CESSNA AIRCRAFT BRINGS DISTINCTIVE CAPABILITIES TO THE EUROPEAN MARKET AND WE ANTICIPATE THEY WILL BE EXTREMELY POPULAR WITH OUR CUSTOMERS.'

—TOM PERRY
CESSNA VICE PRESIDENT OF
SALES, EUROPE

market improvement includes educating people about business aviation on two levels. "First, it's about shifting attitudes: from being seen as wealth and opulence to being viewed as a business tool. The majority of our customers are using business aviation to fill gaps in airline schedules, or when their itinerary is simply not possible with scheduled airlines (for example, they have several meetings in one day). For a company, it's often about weighing up whether they want their CEO spending hours at an airport or taking him there and back and refreshed in the same day. Ultimately it's about efficiency."

"Second, it's about making private jet booking more transparent and accessible. The market is often seen as confusing, complicated and intimidating. Private jet booking platforms like PrivateFly give the customer more control, speed and transparency."

Twidell sees polarised future growth in Europe – primarily in the ultra-long range and very light jet categories. "The mid-sized jet market is contracting. In today's climate, the customer is choosing efficiency or luxury, but increasingly avoiding the middle ground. I think the middle ground will recover as people are able to upgrade their jet choices as the market recovers."

In terms of business segments, charter has seen the most growth since the recession, versus fractional and full ownership. "Fractional ownership is struggling to continue to appeal, especially to the new breed of private jet user who wants to be more in control of their costs."

DESIRE FOR BRAND NEW JETS

CEPA's Whyte said, "There is a clear increase in the desire of the business aircraft buyers for brand new jets," based on research his organisation recently conducted of private aircraft preferences and desires of the ultra-high net worth individual (UHNWI) in Central and Eastern Europe. He quickly added, "There is also a very healthy demand for pre-used, mid-sized aircraft, which continues to grow."

Whyte said price is "not the overriding factor in the decision-making process. The manufacturer of the aircraft has a huge influence." The research also showed that "one person alone makes the decision," not altogether surprising in uber-wealthy circles. CEPA's role in the CEE region, according to Whyte, is to help create "more understanding and bridging the differences that may exist between the methods of doing business. An example of this is when transactions take place between companies and individuals from the east and the west; there can be cultural differences and/or erroneous expectations affecting the trans-

action. Another example is financing, which requires different structuring than in other parts of Europe. A big part of what we do is connecting banks and institutions to aid financing."

Whyte said there is also the misconception that the workforce is unskilled in the CEE, which is not the case. "The CEE has a highly skilled aviation workforce."

"All of the economic data shows this is a market to have confidence in," Whyte emphasised. "We know that the number of air operator certificate (AOC) holders being created is growing, which means that aircraft are being registered in their own countries, staying in the CEE, rather than being moved to outside of the region."

Even critical geographical areas like Ukraine have a major potential which will drive successful growth of the industry. The CEPA countries will find ways to manage their way through economic cycles and transient political upsets.

Whyte added, "Many countries in the CEE have high additional potential for growth in aviation, including Bulgaria, Romania and the Czech Republic, as well as Poland. Compared to the rest of Europe, I believe the CEE is a key market for the future, despite its complications."

EURO CHALLENGES

The private jet industry is highly fragmented in Europe. There are over 2,500 aircraft available to charter, which are managed by around 600 AOCs, typically with just two or three aircraft each. Twidell predicted, "I think we will also inevitably see market consolidation with small companies not being able to compete with the resources of those with larger managed fleets."

Twidell lamented that one area restricting business aviation growth is, "the burden of bureaucracy," which has exponentially increased over the last decade, making it almost impossible for small companies to remain profitable." He listed air passenger duties (APD), limitations on airport access, carbon trading, safety management systems, and operational challenges such as crew duty restrictions.

The UK, for example, plans to raise the APD by 50 per cent or more (effective April 2015) for aircraft weighing more than 20 tonnes and with fewer than 19 seats on flights of more than 3,200 km. The British Business and General Aviation Association has warned that the APD changes could "damage corporate business aviation and the inward investment it brings to the UK."

The carbon trading, or emissions, issue has created a firestorm with the European Union attempting to implement its



'INCREDIBLE HARD WORK AND DEDICATION FROM OUR PEOPLE WENT INTO THE LEARJET 85 AIRCRAFT DEVELOPMENT PROGRAMME.'

—ÉRIC MARTEL
PRESIDENT, BOMBARDIER
BUSINESS AIRCRAFT



'THE FALCON 7X HAS BECOME OUR FASTEST SELLING BUSINESS JET EVER.'

—ERIC TRAPPIER
CHAIRMAN AND CEO OF
DASSAULT AVIATION



'WE HAVE THIS PERFECT SITUATION IN THE PHENOM 300 WHERE WE HAVE THE MARKET LEADERSHIP AND THE HIGHEST PRICE IN THE SEGMENT.'

—FREDERICO FLEURY
CURADO, PRESIDENT AND
CEO, EMBRAER



'OVER THE LAST DECADE, WE'VE BEEN HEAVILY INVESTING IN GULFSTREAM, AND THAT INVESTMENT IS BEGINNING TO PAY OFF.'

—PHEBE N. NOVAKOVIC
CHAIRMAN & CEO OF
GULFSTREAM PARENT
GENERAL DYNAMICS

own fees on intra-Europe flights (and possibly international flights into and out of Europe) without waiting for global "market-based measures" which the International Civil Aviation Organisation (ICAO) is attempting to formulate by 2016.

"With all of this expense for AOC holders, the customer often finds a way around these limitations by going to the 'grey' market and flying commercially on a non-AOC aircraft," Twidell said. "This, of course, is dangerous for both the passengers and the industry."

OEM HIGHLIGHTS

Following are highlights of recent developments among the major business aviation aircraft manufacturers.

Beechcraft and Cessna to Touch \$4 billion in Revenues

Textron which already owned Cessna, acquired Beech Holdings, parent of Beechcraft and Hawker, and has reorganised them into Textron Aviation, which together is expected to produce more than \$4 billion in annual revenues. Scott A. Ernest, Cessna's President and CEO since 2011, will lead the Textron Aviation segment as CEO.

Cessna's Citation Latitude prototype is currently in flight test mode since its maiden flight in mid-February. The twinjet is said to have already achieved its "full performance envelope." The aircraft features a new, larger fuselage with the wings, tail, and systems of the Citation Sovereign+, Garmin G5000 avionics, and is the only Cessna jet with a flat floor. US Federal Aviation Administration (FAA) certification is anticipated in the second quarter of 2015.

"We have several exciting products launching in Europe this year – we expect the Citation M2, Cessna Grand Caravan EX, and Cessna TTx to all achieve European Aviation Safety Agency (EASA) type certification in 2014," said Tom Perry, Cessna Vice President of Sales, Europe. "Each aircraft brings distinctive capabilities to the European market and we anticipate they will be extremely popular with our customers."

Bombardier's Learjet Programme

The Bombardier Aerospace Learjet 85 aircraft successfully completed its first flight in April. All flight controls were said to be exercised with the systems and the aircraft performed as expected. Éric Martel, President, Bombardier Business Aircraft, stated, "Incredible hard work and dedication from our people went into this aircraft development programme. This includes our sites in Wichita, United States; Querétaro Mexico; and Montréal, Canada, as well as our facility in Belfast, Northern Ireland."

Dassault Falcon 5X on Track for Early 2015 Delivery

Dassault Falcon says progress of its new Falcon 5X business jet is going well with the first flight still on track for early 2015. The company hopes to certify the new type in 2016, followed by a first delivery in 2017.

Dassault has delivered its 250th Falcon 7X. Eric Trappier, Chairman and CEO of Dassault Aviation, said, "The Falcon 7X has become our fastest selling business jet ever." The fleet has accumulated more than 2,50,000 flight hours since it was introduced in 2007.

Embraer's Strength

The business aviation strength of Embraer has been in the very light jet category. They recently delivered the 300th copy of the Phenom 100, and are approaching the 200-mark for the larger Phenom 300. "The [Phenom] 300 is really performing well, selling well, and has a strong pricing. We have this perfect situation in the 300 where we have the market leadership and the highest price in the segment," President and CEO Frederico Fleury Curado said.

When Embraer's new Legacy 500 finally debuts later this July, it will be the first fly-by-wire aircraft in the midsize business aviation class. Embraer has been rounding out its executive aircraft line, adding the Legacy 450 and 500 models in between the Phenoms and larger Legacy 600/650 and Lineage 1000 types.

Gulfstream

Gulfstream delivered 39 aircraft during the first quarter of 2014, a 34.5 per cent increase from a year ago, including 33 large-cabin and six mid-size jets. Phebe N. Novakovic, CEO of Gulfstream parent General Dynamics, said, "Over the last decade, we've been heavily investing in Gulfstream, and that investment is beginning to pay off."

The new flagship, the Gulfstream 650, is the world's fastest private jet (it broke the city-pair speed record for New York to Mumbai, making the 6,754 nautical mile trip in 13 hours and 49 minutes). There's a three-year waiting list with more than 150 buyers already. However, the G650 is now available for charter in Europe for the first time – only £99,000 (about \$1,66,000) for a roundtrip from London to Dubai. The high-tech luxury interior includes a full bar and kitchen and accommodates up to 18 passengers. PrivateFly's Twidell said, "The G650 is creating enormous interest and is the ultimate VIP status symbol, with some very high-profile buyers waiting in line to own one." SP

HIGH OPTIMISM



Business aviation accounts for over \$20 billion to the European economy and employs more than 1,60,000 people across Europe

BY R. CHANDRAKANTH

PHOTOGRAPH: EBACE SHOW MANAGEMENT

AVINODE BUSINESS INTELLIGENCE FORECASTS a positive year for the business aviation markets in Europe and the United States in 2014. It forecasts a 0.7 per cent increase in business jet flights in the US, with positive numbers across most of the regions. In Europe, despite several years of negative growth, Avinode predicts that the market will remain flat in 2014 with a marginal 0.1 per cent growth. The year 2014 is going to be a mixed bag for the two regions that make up the European continent. Northern Europe which tends towards business travel is forecast to experience a 0.9 per cent decline in actual flights

during 2014. The more leisure travel oriented southern region, on the other hand, is predicted to see a flight activity increase of 0.7 per cent next year. After several years of decline this should be a welcome break for southern Europe, though it will not bring the region back to the previous high water mark.

Avinode projects that some of the current trends will continue with minor variations, while others will see an about-face next year. In Europe, the light jet category which encompasses the entry level light and super light jet sub-categories, will experience a slight decline of 0.5 per cent, brought on primarily by



PANAORAMIC VIEW FROM THE STATIC DISPLAY OF AIRCRAFT AT THE GENEVA INTERNATIONAL AIRPORT DURING EBACE 2013

the market share losses in the light jet sub-category. Entry level jets however, are projected to continue their upswing with a 2.3 per cent increase.

Moving up the weight categories, Avinode states that the European decline in midsize jet category, which includes the midsize and super midsize jet sub-categories, will continue into 2014 with a loss of 3.6 per cent in flight activity. Avinode sees growth across the board on the heavier side of the chart, with the heavy jet category, which accounts for the heavy and ultra long range jet sub-categories, growing by 3.6 per cent in Europe. The ultra long range sub-category is forecast to grow by 3.1 per cent in 2014, while in Europe, where the jet class appears to be largely unaffected by general market trends, ultra long range jets are expected to garner 8.6 per cent more flights in 2014.

BUSINESS AVIATION IN EUROPE

The reason why almost all the players are present at EBACE 2014 is that business aviation provides its users with a means of transportation that is both efficient and flexible, connecting 1,03,000 cities-pairs in Europe that is more than three times

the city-pairs connectivity provided by scheduled carriers. Actually, 96 per cent of these city-pairs are not served in a regular way by scheduled air transport, states the European Business Aviation Association (EBAA).

Despite popular misbeliefs, with only 0.04 per cent of the total CO₂ emission, the ecological footprint of business aviation is the smallest of all transport industry. It actually only emits less than two per cent of the total air transport emissions, whilst it represents more than seven per cent of the total IFR movements in Europe. Besides, business aviation is the only sector that offsets 100 per cent of its emissions.

As a sector, business aviation accounts for over \$20 billion to the European economy and employs more than 1,60,000 people across Europe.

EXTREMELY COMPETITIVE SECTOR

With over 800 operators and around 4,000 business aircraft composed of turboprops and jets, the sector is extremely competitive and boasts of a variety of concepts and business models which make it a very flexible, easy to adapt, business



SPACIOUS AND ELEGANT:

AIRBUS ACJ319 OPERATED BY K5 AVIATION HAS A SEATING FOR 19 PASSENGERS IN A CABIN WITH SEVERAL LOUNGES, INCLUDING ONE THAT CONVERTS TO BEDROOM WITH ENSUITE BATHROOM

tool for executives who need to tour Europe and the world in their quest for.

As a matter of fact and contrary to other regions of the world, around two-thirds of all movements in Europe are charter, commercial, operations, whilst the remaining is split between corporate and private, both non-commercial activities thus underlining the close relationship between Europe Plc and business aviation.

EBACE GUIDANCE

In this background, the European Business Aviation Convention and Exhibition (EBACE) 2014, will be held at Geneva from May 20 to 22. The premier event is an annual meeting place for the European business aviation community. The exhibition brings together business leaders, government officials, manufacturers,

corporate aviation department personnel and all manner of people involved in nearly all aspects of business aviation. New business aircraft firms, avionics firms, handling organisations, fractional providers, charter/lease companies and previously titled aircraft resellers display their wares. EBACE is jointly hosted each year by the EBAA, the leading association for business aviation in Europe, and the National Business Aviation Association (NBAA), the leading voice for the business aviation industry in the United States. Although EBACE is the only major European event focused solely on business aviation, attendees come from as far as Africa, Asia, the Middle East and North America.

The impressive exhibition takes place at the magnificent Palexpo, which covers more than 1,00,000 square metres. At

ALTHOUGH EBACE IS THE ONLY MAJOR EUROPEAN EVENT FOCUSED SOLELY ON BUSINESS AVIATION, ATTENDEES COME FROM ACROSS THE WORLD

**HIGH ON FEATURES:**

GULFSTREAM'S G280 IS A SUPER MID-SIZE BUSINESS JET; CESSNA'S CJ4 IS LOADED WITH ULTRA MODERN FEATURES.

Geneva's Palexpo, EBACE showcases nearly 500 exhibiting companies from around the world and covers more than 36,000 square metres of area. At the nearby Geneva International Airport, over 50 aircraft, including nearly every major business aircraft design in current production, will be on display in a special 18,000-square-metre area. Going by the previous edition which had 12,353 attendees, representing 94 countries, 460 exhibitors – the third-highest number in the event's 13-year history, EBACE continues to be a must-attend business aviation event.

The event continues to hold promise, irrespective of market movements and a survey indicates why it is popular. According to the EBACE survey, 91 per cent of exhibitors come to see existing customers; 88 per cent to maintain image, presence or awareness; 80 per cent to obtain new sales leads; 38 per cent to introduce new

products and 30 per cent to make sales at the show.

AIRCRAFT ON DISPLAY


Aircraft manufacturers are ever keen on displaying their products at EBACE and the companies are Airbus (ACJ319); Cessna (Citation X, Caravan EX, Citation M2, Citation CJ4, XLS+, Sovereign); Beechcraft (G58 Baron, King Air 250, King Air C90GTx, King Air 350i, King Air 350ER); Boeing Business Jets (BBJ); Bombardier (Learjet 75, Challenger 300, Challenger 605, Global 6000, Global Express); Dassault (Falcon 7X, Falcon 2000 LX, Falcon 900 LX); Cirrus (SR22T GTS); Eclipse (Eclipse 500); Embraer (Phenom 100, 3000, Lineage 1000, Legacy 650, Legacy 500); Gulfstream (G150, G280, G450, G550, G650); Piaggio (P 180 Avanti); and Pilatus (PC 12 NG) among others.

INTERESTING CONFERENCES

After four tough years of austerity and rising taxes, the economies of many European nations are on the mend. At an education session on May 20, a panel of international aviation experts will address the question everyone in business aviation would like answered: Will business aviation profit from the developing upturn in the European economy?

The session, to be presented by Pete Bunce, President and CEO of the General Aviation Manufacturers Association (GAMA); David Marsh, Eurocontrol; Charles Schlumberger, World Bank; Alasdair Whyte, Corporate Jet Investor; and a representative from Ascend, will analyse macroeconomic and operational indicators to forecast the impact on business aviation.

Despite growth in other regions of the world since the recession ended, the industry is still trying to determine whether Europe's share of worldwide general aviation aircraft sales which has plummeted from 25 per cent to 15 per cent, is the "new normal," according to Jens Hennig, GAMA's Vice President of Operations.

"It appears that Europe is still continuing to struggle its way through economic uncertainties," said Hennig, noting that other markets seem to be stabilising. 

THE FACTS

- 96 per cent – proportion of city-pairs served by business aviation in 2011 that had no scheduled connection. The remaining four per cent represent however more than a third of business aviation traffic in volume.
- Twice as fast as GDP – expected medium-term growth rate for business aviation demand at Paris, Le Bourget
- 70 per cent – proportion of business aviation flights taking off and landing at airports handling fewer than 100 departures per day
- 66 per cent – proportion of corporate decision-makers regarding face-to-face meetings as critical to M&A success
- Up to 25 per cent of operator revenues are derived from multiple destination journeys
- 1,64,000 – persons employed in business aviation around Europe
- €9 billion – value of business aviation aircraft manufacturing



GETTING THE SIZE RIGHT

Fleet planners are challenged with making the right decision for their airline in the existing operating environment while anticipating the airline industry's future

BY R. CHANDRAKANTH

NO ONE SIZE FITS all. It calls for mix and match. It applies to the airline industry too. The size of the aircraft is critical, if the operator is keen on expanding markets and customer base, while remaining financially viable. In mature markets, the issue of seat configuration may not be that much of an issue as it is in developing economies.

WIDESPREAD GROWTH

Several developing countries are witnessing phenomenal

growth of Tier-II and Tier-III cities and towns and all waiting to be connected to the metros and beyond. India and China are two emerging economies that are experiencing transformation at different levels. Villages are growing and becoming towns. Towns are becoming cities and cities are transforming into mega cities. Making all this happen is multi-modal transportation, air included.

In India and China, there is a surge of development in Tier-II and Tier-III cities. In India, cities such as Ahmedabad, Amrit-

sar, Bhopal, Coimbatore, Guwahati, Kochi, Lucknow, Mangalore, Pondicherry which are classified as Tier-II, are witnessing rapid economic development. Similarly, in China, Tier-II cities such as Chengdu, Sichuan, Chongqing, Dalian, Liaoning, Hangzhou, Ningbo, Zhejiang, Kunming, Yunnan, Nanjing, Suzhou, Jiangsu, Qingdao, Shandong, Tianjin, Shenzhen and Zhuhai, Guangdong, Wuhan, Hubei, Xiamen, Fujian, Xi'an and Shaanxi are rapidly getting into the mainstream. Besides, there are approximately 200 county-level cities in China that fall in the category of Tier-III cities such Zhongshan, Shantou, Xining and Baoding.

PLANNING CONSIDERATIONS

In this scenario where all modes of transportation will be at different levels of advancement, air transport certainly will be the one lagging behind for obvious reasons. Investments are high, margins are thin and entrepreneurs have to be daring. This certainly calls for extensive planning and foresight on the part of an airline operator on not just how to nurture the nascent market, but to remain in tune with developments. A classic example of forward planning is that of Vijayawada-based Air Costa which was launched in late 2013 with Embraer E-170 Jets with seat configuration of 67. It presently connects Tier-II cities such as Jaipur, Coimbatore, Ahmedabad, Visakhapatnam, Vijayawada, as well as the metros Bengaluru, Chennai and Hyderabad. The operator claims to have respectable plane load factor and if the going is good, then the operator has to make the next move. In fact, Air Costa has already done so by ordering 50 Embraer E-190 E2 and E195-E2 jets which will have seat capacities of 98 to 118. These routes which currently are thin, are expected to grow. Air Costa can then deploy the E-170s to other Tier-II and III cities.

Flying narrow-body planes such as the Boeing 737 or Airbus A320 which have about 180 seats on thin routes, does not make any business sense as the demand is not there. Demand has to be created and nurtured and this will take time. Airlines such as SpiceJet, Air India and the defunct Kingfisher Airlines used turbo-props on the thin routes.

MATCHING SIZE WITH DEMAND

Canadian aerospace major Bombardier and Brazilian giant Embraer have started making a pitch for small jets to connect small towns to the cities and metros. They have jets which are configured to provide seating between 70 and 120, thus promising operators a lower seat-km costs. Seat-km cost is the unit cost incurred to fly a certain number of passengers on a particular route.

Brazilian aircraft manufacturer Embraer sees strong growth prospects for small jets in India. "About 84 per cent of all routes in the Asia-Pacific have demand of less than 300 seats. Airlines need to have aircraft that offer the right capacity and cost structure. The E2 jets will offer 20 per cent lower trip costs than a Boeing 737 Max or an Airbus A320neo. In 10 to 20 years, we expect demand for 200 aircraft in the 70- to 120-seat category from India. We expect we will have a significant share of that," says Mark Dunnachie, Vice President (Asia-Pacific), Embraer Commercial.

The E2 aircraft will give the Indian carriers flexibility to redraw schedules. Airlines can fly a Boeing 737 or an Airbus

A320 during the morning rush hour and a 120-seater in the afternoon, when the demand for travel is low. Dunnachie said many airlines including LOT Polish Airlines and Jet Blue deploy Embraer jets during non-peak hours.

EMBRAER'S RULE 70-110

Embraer states that several mainline aircraft with high number of seats are increasingly flying routes where the demand is low. Meanwhile, regional markets are still expanding, putting pressure on the current breed of regional jets to carry more passengers more frequently. Clearly, passenger demand is trending towards the 70- to 110-seat segment, a range for which an efficient aircraft family didn't exist until now. In other words, the industry is facing an acute equipment gap at the same time a relevant portion of the segment's fleet is approaching the end of its economic operational life.

DEMAND-CAPACITY GAPS

Embraer states that mainline jets with 120-plus seats are effective in serving large-market, high volume city pairs. And on lower demand routes, 50-seat regional jets have been successful. However, market volumes requiring 70- to 110-seat jets are currently being served inefficiently due to the industry's lack of optimised aircraft. Commercial carriers have a

limited number of options to right-size fleets for efficient operation in the 70- to 110-seat category. Neither current mainline aircraft nor regional jets are best suited to serve the emerging 70- to 110-seat market.

REGIONAL JETS (RJ) STRETCHED

As regional city pair frequencies reach their schedule limits, fully-booked, prime-time 50-seat RJ flights can often spill passengers. With a growing need to serve new long and thin markets, RJs are increasingly being pushed to enhance frequency in the drive to sustain revenue growth and market share.

New longer distance missions require greater focus on cabin comfort and passenger amenities with baggage and cargo capacities similar to those found on mainline jets. Like the large capacity narrow-body jet operators, regional carriers have few equipment options to serve emerging demand in the 70- to 110-seat market segment.

AGEING COMMERCIAL FLEET

More than one-third of the world's in-service fleet of 61- to 120-seat aircraft are over 20 years in age and approaching the end of their economic lives. Fleet planners are challenged with making the right decision for their airline in the existing operating environment while anticipating the airline industry's future. Retiring older aircraft gives operators the opportunity to optimise fleets, right-sizing for profitability in the 70- to 110-seat market.

Embraer states that the logic behind the Rule of 70 to 110 is easy to understand. Put simply, the Rule suggests that ideally, a carrier match aircraft capacity to passenger demand precisely. Currently, some flights don't carry enough revenue passengers to cover operating costs. Yet other flights spill demand to competitors because aircraft are too small. Neither case is optimal. But a range of load factors, from breakeven to the spill point,

ACQUIRING INCREMENTALLY
LARGER AIRCRAFT HELPS
RETAIN PASSENGERS
AND KEEPS AN AIRLINE
COMPETITIVE AS WELL AS
MORE PROFITABLE.

can generate positive returns. Regularly turning away customers in a fiercely competitive market means loss in revenue and may also strengthen a rival's market hold. Acquiring incrementally larger aircraft helps retain passengers and keeps an airline competitive as well as more profitable.

The shifting market dynamics of the present times, led Embraer to the principle of fleet capacity optimisation and the Rule of 70 to 110. Applied correctly, The Rule helps airlines achieve operating efficiency without compromising per-

BRAZILIAN AIRCRAFT MANUFACTURER EMBRAER SEES STRONG GROWTH PROSPECTS FOR SMALL JETS IN INDIA.

formance or passenger comfort. For both mainline operators and regional carriers, following the Rule of 70 to 110 can mean matching capacity to demand, increasing frequency, right-sizing fleets and maintaining existing markets while growing new business.

The Embraer 170, 175, 190, and 195 jets are a new-evolution family of aircraft, each engineered from the ground up to be comfortable, efficient and cost-effective. From the earliest planning stages, engineers understood the need for a new platform, an airframe created specifically for the 70- to 110-seat segment. The result incorporates new technology on the flight deck and proven design elements in the cabin, making the new airframe both pilot and passenger friendly. ^{SP}

THE RULE OF 70 TO 110

Answering Capacity/Demand Gap

The Rule suggests airlines right-size fleets and match capacity to demand to optimally serve the growing 70-to 110-seat segment.

Answering Excess Capacity

The Rule states that by incorporating efficient right-sized aircraft, airlines can increase frequency of 70-to 110-seat flights to capture market share. And while providing customers with more choice, they can keep 120-plus seat aircraft on high-demand routes.

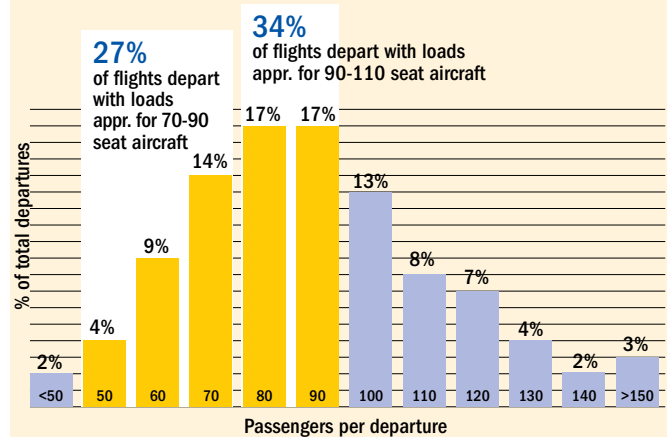
Answering Expanding Regional Markets

The Rule proposes that aircraft in the 70-to 110-seat capacity category, with narrow-body jet type cabin comfort and mission performance, will blur the line between mainline and regional aircraft and optimally serve new market opportunities.

Answering Ageing Fleets

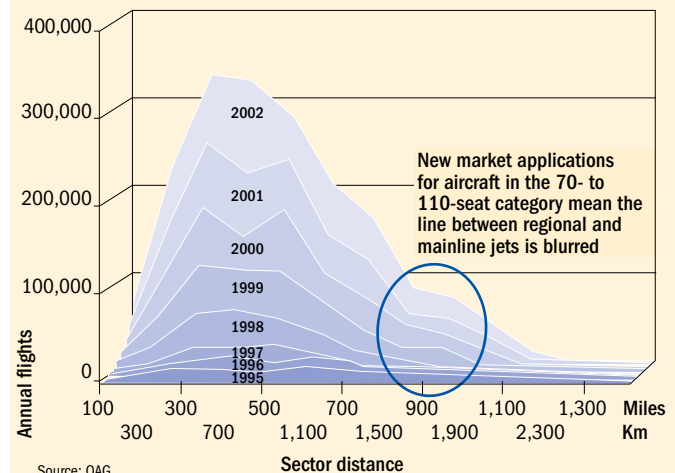
With nearly 700 aircraft reaching the end of their economic lives, airlines can apply the Rule to right-size fleets with new-generation aircraft that are built to last, employ the latest technology, and are specifically designed for the 70-to 110-seat segment. ●

EXCESS CAPACITY HURTS THE BOTTOM LINE



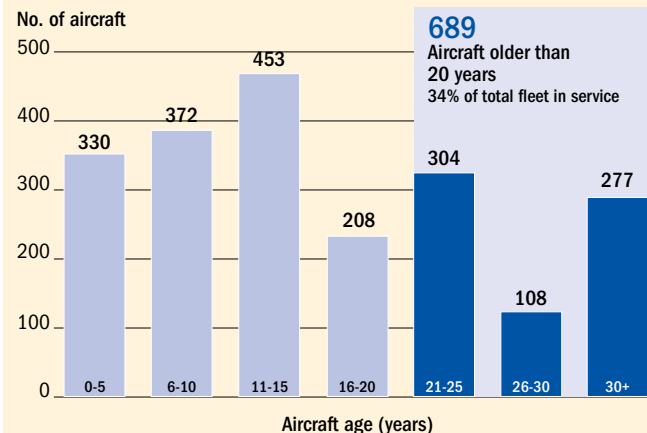
Source: US DOT/BACK Aviation Solutions

REGIONAL JET STAGE LENGTHS



Source: OAG

FLEET IN SERVICE (61- to 120-seat segment)



Source: BACK/Fleet PC



A NEVER ENDING DEBATE

What remains unclear, with fuel and environmental standards putting pressure, is whether the market will continue with larger regional jets or combine jets and turboprops

BY R. CHANDRAKANTH

PHOTOGRAPHS: BOMBARDIER, EMBRAER

TURBOPROP AIRLINERS EXISTED MUCH before fast-paced jets came on the horizon. They will continue to. Though some aviation pundits not long ago, forecast that turboprops would become obsolete, they have been proven wrong. Turboprops continue to flourish and the debate 'what is good for regional airliners: jets or turboprops' is a never ending one. The latter may look old with propellers on their wings, but they have been given a new avatar, escalating the competition for the jets.

At the turn of the century, Brazilian aerospace major Embraer stopped making its turboprop EMB-120 Brasília, switching entirely to producing jets, setting off a debate on the future of turboprops. While Embraer changed lanes, ATR never gave up and continues to focus on its turboprop strength. So does Canadian aircraft manufacturer Bombardier which has a mix of turboprops and jets. ATR that proclaims 'proud to be turboprop' states that one of the current and future challenges

faced by airlines is controlling fuel costs and that turboprops offer the best solution for regional aircraft.

Basically, both turboprops and jets are turbine powered, except that turboprops have bigger fans on their wings, while the pure jets have fans encased. The turbine used on a turboprop is designed specifically for the application and burns much less fuel. Technology-wise the two are in a neck and neck race. Some of the turboprop airliners are fitted with radar, GPS, heads-up display, noise reduction equipment, etc.

BURNS LESS FUEL

The unique selling proposition of a turboprop is that it burns much less fuel per passenger. On short haul flights with flying time of about an hour, turboprops offer bang for the buck on fuel economics. It has been reported that an ATR 72 consumes half the fuel of a regional jet for a distance of 300 nm and in these days when fuel accounts for almost 40 per cent of operating costs at least in some parts of Asia, the fuel economics of a turboprop seem attractive. According to ATR, brand new turboprops on short routes can achieve five per cent savings per year of operation. There are significant cost advantages in turboprops where labour rates are lower in terms of crew and ground support.

While fuel savings is good, turboprops have come under the scanner for capacity and capability when regional airlines are flying longer distances. Nevertheless, turboprops having got an early lead, account for over half of all regional aircraft deliveries in the 50- to 70-seat configuration. ATR has said that in the 70-seat segment where most competition today takes place, 75 per cent of aircraft ordered since 2005 are turboprops and about 92 per cent of the 70-seat backlog are for turboprops. These are clear indications of their market domination in the US and elsewhere too.

SEAT DYNAMICS

The seat configuration dynamics is throwing up new regional strategies with 50-seat jet coming in for competition by 70-seat turboprops. This means that for the same money, airlines get 20 more seats flying at half the fuel cost per seat. In the 70- to 110-seat category, the trend is towards jets such as those from the Embraer stables. Till date, ATR has delivered 1,056 turboprops. At the Singapore Air Show in February 2014, it had bookings for 48 aircraft, beginning the year on a healthy note. In 2013, it ended with a total of 195 aircraft sold, 89 firm orders and 106 options.

Bombardier's Dash 8 or Q Series (Q100 and 200 Series – 39-seat capacity; Q300 – 50-seat and Q400 – 90-seat capacity) have been in the forefront of turboprop orders. Bombardier stopped production of the Series 100 in 2005, and the Q200 and Q300 in 2009. Bombardier is considering launching a stretched version of the Q400 most likely in 2015.

REGIONAL JETS RACING AHEAD

While these developments are happening, fast-paced and efficient regional jets are altering the economics of aviation. Although more expensive than turboprops, regional jets allow airlines to operate passenger services on routes not suitable for turboprops. Turboprop aircraft have lower fuel consumption and can operate from shorter runways than regional jets, but have higher engine maintenance costs, shorter ranges and lower cruising speeds. When world oil prices drove up short-haul airfares in 2006, an increasing number of airlines that had bought regional jets began to reassess turboprop regional airliners, which use about 30 to 60 per cent less fuel than regional jets.

The reason for the turboprop revival is simple. - continuously rising price of aviation turbine fuel. Filippo Bagnato, CEO of ATR

states that the turnaround began when crude rose above \$35 a barrel in the years following the Iraq war. Planes powered by jets are faster, but for flights of less than around 500 nautical miles, the shorter time spent in the air is insignificant compared with the fuel savings to be made by flying a slower turboprop. As it has become increasingly uneconomic to fly regional jets with fewer than around 70 seats, the turboprop has come to look like a better option. There seems little chance of oil going back down to the levels that had for a while made their fuel efficiency unimportant.

TECHNOLOGY UPGRADE

As for the question of noise and discomfort, the manufacturers of turboprop airliners have devoted considerable effort into improving the quality of the cabins of their airliners and in particular in reducing noise and vibration. Bombardier uses noise-cancellation technology, whereas ATR uses insulation and fancy electronics to synchronise the propellers.

The Teal Group, an aviation consultancy, forecasts a market of around \$2 billion a year for turboprops from now into the 2020s, a nice little business, though still a fraction of the market for jets.

BIGGER IS BETTER

"There was a time when there was a clear need for smaller planes like the turboprops, but I think the Indian market has outgrown the need for such planes," said Mark Dunnachie, Vice President, Asia-Pacific, Embraer Commercial Aviation. The E2 will also score over bigger jets. "The E-195-E2 jets will be at least 20 per cent cheaper in terms of trip costs as compared to the Boeing 737 or the Airbus A320. Even the cost of operating an E-175-E2 will be cheaper in terms of trip costs as compared to the Boeing 737 or the Airbus A320 and also cheaper in terms of trip costs as compared to turbo-propeller aircraft. The cost of operating an E-175-E2 will be cheaper per seat mile as compared to turbo-propeller aircraft," said Dunnachie.

The Bombardier Q400 can carry 68 to 78 passengers while the ATRs have a capacity of 50 to 70. The Embraer E-175 can carry 80 passengers while the E-190 and the E-195 can carry 110 passengers.

For now the market is clearly favouring larger regional jets, which drove the changes to the Mitsubishi MRJ with the MRJ-100 x 100 seater. Even so, the MRJ-70 and MRJ-90 could further stretch the regional catchment. The 90- to 150-seat regional jet market is becoming increasingly crowded with Russia, Japan and China jumping into the fray.

FUTURE FAVOURS TURBOPROPS

What remains unclear with fuel and environmental standards putting pressure is whether the market will continue with larger regional jets or combine jets and turboprops. ATR thinks not and is predicting that it could become a market leader again since all the pressures on regionals certainly conspire in favour of turboprops.

"The reduced margins from 10 to 14 per cent to four to six per cent will push regionals to select the right aircraft so the turboprop will play an increasing role," said Mario Formica, Vice President, Marketing of ATR at a recent Regional Airline Association conference, predicting a need for 2,950 new turboprops at a value of \$71 billion. "The 2000 forecast saw a market that was 15 per cent turboprops and 85 per cent regional jets. But, 10 years later we see turboprops will be 40 per cent of the market potential for a better balance between regional jets and turboprops. In the last five years sales in the 50- to 70-seat category bear this out with 560 turboprops to 140 regional jets. It is clear that a lot of airlines are rethinking their approach to turboprops." SP

“WE ARE KEEN ON PLAYING A GREATER ROLE IN NEW INDIGENOUS PLATFORMS SUCH AS THE MULTI-ROLE TRANSPORT AIRCRAFT AND THE REGIONAL TRANSPORT AIRCRAFT”



Eaton is a power management company and a world leader and premier innovator in the regime of aerospace in which it designs, manufactures and integrates the industry's most advanced products and technologies. These products power hundreds of military and commercial aircraft platforms with a focus on improved reliability, weight reduction and fuel efficiency. Eaton has customers in more than 175 countries. **Uday Yadav**, President, Aerospace Group, Eaton, in conversation with **Air Marshal (Retd) B.K. Pandey**, Senior Editor, *SP's Aviation*.

SP's Aviation (SP's): Can you briefly describe the profile of your company, its range of products and technologies across the spectrum of military as well as non-military applications?

Uday Yadav (Yadav): Eaton is a power management company providing energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power safely, efficiently and sustainably. Eaton is a world leader and premier innovator in providing cutting-edge systems, solutions and technologies to the global aerospace industry. We design, develop, manufacture and integrate the industry's most advanced offerings in the areas of engine solutions, fuel and inerting, hydraulic systems, and motion control.

For Eaton's aerospace business, India is an emerging market as the industry is witnessing rising investments from both commercial and defence segments. Eaton's aerospace products are prolific on a variety of aircraft fleets widely used by Indian operators. The business in India is represented by a Sales and Support office located in Pune and Bengaluru. Eaton's India Engineering Centre (EIEC) in Pune is the largest integrated engineering center for Eaton globally. This engineering center provides new product design services, system design services and existing product engineering support for aerospace.

Eaton's aerospace business supports various commercial platforms including the Airbus A320 and the Boeing 787 and 737 in India with significant Eaton content. Specific to India and in addition to commercial programmes, Eaton supplies significant content to indigenous Indian air defence programmes, such as the Tejas fighter jet, Saras transport aircraft, Hansa flight training aircraft, HJT 16 Kiran jet trainer, and ALH. Eaton also supports a host of Western military platforms flying in India, such as Jaguar, Sea King Helicopters, Hawk, Lockheed C130J, C17 and Boeing BBJs.

SP's: What is the history and size of the company's presence in India and the range of activities/ products that the company has to offer to the Indian market?

Yadav: Eaton considers India as a very strategic and important market. Eaton entered India in the year 1999 through the global acquisition of Aeroquip vickers. Today, with 18 locations and seven manufacturing facilities, all of Eaton's businesses – aerospace, electrical, hydraulics and Vehicle are well represented in India. Eaton also has captive centers for engineering services, financial support services, global support services, IT support and global sourcing. In India, Eaton is headquartered

in Pune and has more than 3,800 employees across all locations in the country.

Eaton's diverse range of products and solutions apart from aerospace as described above include:

Electrical: In India Eaton's Electrical Sector business is headquartered in New Delhi. The business has sales offices in nine cities across India and a contract manufacturing facility at Manesar near Delhi. Eaton's Electrical business in India provides power distribution, power quality and back-up, control and automation, power monitoring and management solutions and services to commercial, residential, utility, alternative energy, IT and data centres, public sector institutions and OEMs. Eaton is a leader in UPS systems, power conditioning products and DC power system products. Eaton's Power Distribution solutions encompass low voltage and medium voltage distribution & control, automation products and services to help our customers manage electrical power across utility, industrial, renewable energy, buildings and infrastructure markets.

In November 2012 Eaton completed the acquisition of electrical equipment supplier Cooper Industries plc. As part of this acquisition two manufacturing locations of Cooper in Pondicherry and Chennai are being integrated into Eaton's India operations. The manufacturing facility at Pondicherry manufactures high voltage fuses, high speed fuses, low voltage bus fuses, solar fuses, low voltage din type fuses, expulsion links, fuse holders, PV combiner boxes. The Chennai facility manufactures intrinsic safety barriers and isolators, distributed i/os for hazardous area applications, fieldbus barrier components.

Hydraulics: Eaton's Hydraulics business in India is headquartered at Pimpri, Pune. Eaton is recognised as a worldwide leader in the design, manufacture and marketing of reliable, high-efficiency hydraulic systems and components for use in mobile and industrial applications. The hydraulics manufacturing facility at Pimpri is one of Eaton's Centers of Excellence (COE) for gear pumps and has been expanded to also manufacturing of steering control units and Rockshaft Control valves. The other key products manufactured at this facility include gear pumps, vane pumps, piston pumps, direction control valves, mobile valves, hydraulic power units and cylinders.

Vehicle: Eaton's Vehicle Group in India has manufacturing plants in Ranjangaon, Ahmednagar and Nasik. Eaton manufactures and supplies medium and heavy-duty truck transmission and components, superchargers and products for valve actuation, torque control and fluid conveyance. Eaton provides an array of products and solutions that include:

- Six speed manual transmission for various applications like tippers, tractor-trailers, and haulage vehicles.
- Nine speed manual transmission on demanding vocational applications (tippers) and haulage vehicles.
- Hybrid solution on CNG engine and diesel platforms.
- Automated manual transmission (AMT) for various applications.
- 380 and 430 SD clutch for various and extremely niche demanding application (deep mining tippers).

SP's: Your company has already been involved in product support for a number of aircraft in service with the Indian Air Force. Has your company considered entering the field of maintenance, repair and overhaul (MRO) for civil and military aircraft, an area somewhat underdeveloped in India?

Yadav: Eaton's goal is to increase support for our customers in India by expanding our distribution channels for our products and solutions and by establishing the appropriate level of service (MRO) for the indigenous and acquired aircraft of the Indian Air Force. Ultimately we want to deliver the best value by optimising aircraft performance and by superior management of the lifecycle cost.

SP's: India being the largest importer in the world of military hardware, opportunities for business related to offset obligations on the part of OEMs winning contracts, is substantial. Has your company factored this in its business strategy in India and if so how?

Yadav: Eaton has partnered with the Hindustan Aeronautics Ltd (HAL) in providing MRO support for our hardware installed on military aircraft. We also expect to continue partnering with HAL on future programmes. In terms of sourcing, we have 13 Indian firms as our key suppliers for global products and we do see India as a best sourcing country. Eaton procedurally also certified and trained these firms to align their standards for components to meet Eaton's standards and requirements.

SP's: Can you please catalogue for our readers the specific achievements of your company in the Indian market?

Yadav: In India, Eaton is supporting the growth of military and commercial aviation sectors along with platforms being introduced into these markets, such as Boeing's 787 and 737. We also

continue to provide support for indigenous platforms by contributing proven products and technologies. Through strategic collaborations with Indian firms, we are keen on playing a greater role in new indigenous platforms such as the multi-role transport aircraft and the regional transport aircraft. Eaton's components and systems are prolific on a variety of aircraft fleets widely used by Indian operators. Commercial platforms in India with significant Eaton content include the Airbus A320 and the Boeing 737, 747 and the newly introduced 787. As an example, on the A320 Eaton provides the hydraulic engine driven pump, electrical motor driven hydraulic pump, electrical emergency generator, hydraulic power transfer unit, engine fuel pumps, airframe fuel transfer and boost pumps, fuel valves and many conveyance products.

Eaton has won significant content on indigenous programmes of HAL such as the Tejas fighter jet, Saras, Hansa, HJT-16, ALH and light combat helicopter on hydraulic, fuel and conveyance systems. Eaton intends to participate with India's armed services in their modernisation programmes and to be proactive in supporting upgrade projects on military fleets. SP

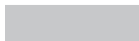
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WE ALSO CONTINUE TO
PROVIDE SUPPORT FOR
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BY CONTRIBUTING
PROVEN PRODUCTS AND
TECHNOLOGIES.



DRAGON ROARS

ABACE is now firmly established as a must-attend event for the international business aviation community and for China's aerospace community

BY R. CHANDRAKANTH



PHOTOGRAPHS: ABACE

THE SECOND EDITION OF the Asian Business Aviation Conference and Exhibition (ABACE) 2014 held from April 15 to 17, ended on a high note, reflecting the growing trend for business aviation not just in China, but across Asia. With surging prospects, ABACE is here to stay. Endorsing this sentiment, the National Business Aviation Association (NBAA) President and CEO Ed Bolen said: "It's clear that business aviation is growing

in China and across Asia – most importantly, that's good news for our industry, but it's also good news for ABACE."

"When we launched the first ABACE in 2012, we said we wanted the show to become not just an annual event, but an enduring event," Bolen continued. "It's clear that in the 25 short months since the first edition of ABACE, we've seen significant growth for the show at every level and ABACE is now firmly

established as a must-attend event for the international business aviation community and for China's aerospace community."

The number of exhibitors at ABACE 2014 was 187, a 20 per cent jump from the 156 exhibitors in ABACE 2012. Of that number, Asian representation was quite high, up from 38 to 73 this year. The number of 3 x 3 metre booth space at ABACE 2014 was 333, up from 236 for the 2012 show. The number of aircraft on static display for ABACE 2014 was 38, a jump from 27. Importantly, for the first time, the display included piston engine airplanes, giving ABACE attendees access to the full spectrum of business aircraft, from pistons through to intercontinental jets as well as helicopters.

ABACE TO REMAIN IN SHANGHAI

ABACE 2015 will take place from April 14 to 16, 2015. Under an agreement signed between NBAA and the Shanghai Airport Authority during ABACE 2014, the event is scheduled to remain in Shanghai through at least 2021.

GULFSTREAM BAGS HISTORIC ORDERS

Gulfstream grabbed headlines with the announcement that Minsheng Financial Leasing Company, the large Chinese financial institute and private aircraft operator, placing an order for 60 Gulfstream business jets (40 firm orders and 20 options) of various sizes. The deal was made in the latter part of 2013, but the partnership was announced and celebrated at ABACE. The deal reportedly worth over \$2.6 billion is said to be the biggest in the history of Gulfstream.

Like at other shows worldwide, Gulfstream at ABACE too created a record with the G-280. The super-midsize, long-range

jet had already set 45 city-pair speed records before it set two more on the way to ABACE this year, making stops in Germany, Dubai and Hong Kong before flying to Shanghai.

"The G-280 flew 2,751 nautical miles from Friedrichshafen Airport in Germany to Dubai International Airport in the United Arab Emirates at an average speed of Mach 0.84 for a total flight time of five hours and 49 minutes," Gulfstream said. From Dubai, the G-280 made the 3,449-mile flight to Hong Kong International Airport with a time of seven hours and seven minutes at Mach 0.82.

DASSAULT FALCON BETS ON CHINESE MARKET

Dassault featured the top-of-the-line Falcon 7X, the long-range Falcon 900LX and the new Falcon 2000LX/S twinjets. Also on display was the Falcon 5X cabin experience that highlighted the impressive cabin dimensions of Dassault's newest business jet.

"ABACE is a terrific event for Dassault Falcon Jet, a great opportunity for customers and future prospects to come out and see our full line of aircraft," said John Rosanvallon, President and CEO of Dassault Falcon Jet.

"Chinese customers have a true appreciation of technology, elegant design and safety, which has helped build a solid reputation and a loyal customer base for the Falcon 7X in China," continued Rosanvallon. "We're also starting to see a China that is more environmentally aware and that is expected to generate further increased demand for Falcon aircraft. Dassault has been designing and building aircraft with low fuel consumption and carbon emission levels for over 30 years. In fact, Dassault builds the most environmentally-friendly jets on the planet."



AN ARRAY OF BUSINESS JETS ON
STATIC DISPLAY DURING ABACE 2014



DIGNITARIES POSE FOR A PHOTOGRAPH AFTER ABACE INAUGURATION; BEECHCRAFT'S TWIN-ENGINE KING AIR 350I



BOMBARDIER'S LEARJET DEBUT IN ASIA

Canadian aerospace major Bombardier brought a LearJet 75 to Shanghai, making its debut in Asia. The light business jet is said to cost \$13 million. Bombardier announced that China's Minsheng Financial Leasing as the buyer of 10 Challenger 350 business jets, the order for which was announced earlier in December 2013.

"We are honoured that Minsheng Financial Leasing has placed their trust in our new Challenger 350 jet," says Bombardier Business Aircraft's President Eric Martel. "Bombardier's best-selling Challenger aircraft family is key to leading business jet fleets around the world and we are delighted to get once again, such a strong endorsement for Bombardier products in China."

ACJ319 ELEGANCE CAPTURES IMAGINATION

Airbus announced a new version of the company's ACJ-319 corporate jet called the ACJ-319 Elegance. The ACJ-319 Elegance has a newly designed interior, giving customers more options when it comes to customising their aircraft. In addition, the new design allows for a smooth transition in the event that a customer wants to upgrade to a new cabin in the future.

The Elegance design offers different module choices for lounge, office, conference or dining needs. It has a bathroom and galley up front, and a bedroom with a bathroom in the back.

BEECHCRAFT & CESSNA SYNERGIES

"As more customers in the region begin to research aircraft and match the products to their missions, we're confident the long history of innovation from our companies and the proven quality of the Beechcraft and Cessna brands will make our aircraft popular choice," said Kriya Shortt, Senior Vice President, Sales & Marketing. "There's no other OEM at ABACE with a broader line of aircraft solutions for this growing general aviation marketplace,

and we're proudly showcasing our unique proposition to one of the most exciting aviation sectors in the world."

Beechcraft Corporation, now part of the Textron, announced the sale of a Beechcraft King Air C-90GTx to the state-owned Beidahuang General Aviation Company of Harbin, China. The King Air C-90GTx aircraft will join a fleet of nearly 90 aircraft operated by the Beidahuang General Aviation Company.

CAAC GRANTS CERTIFICATION TO CESSNA

The Civil Aviation Administration of China (CAAC) has granted certification for Cessna's Citation XLS+ clearing the way for deliveries in China later this year.

"Bringing the Cessna Citation XLS+ to China means introducing this market to the most successful business jet ever produced," said Bill Harris, Vice President, Sales, Asia and Asia Pacific. "Business owners consistently have chosen the Citation XLS+ more than any other aircraft in the light midsize category for its unparalleled combination of comfort, ease of operation and range of mission capabilities." CAAC certification is another step toward beginning operations at Cessna-AVIC Aircraft (Zhu-hai) Co, Ltd. for final assembly and delivery of Citation XLS+ business jets to customers in China.

Cessna announced a landmark order for Caravan turbo-prop aircraft to be operated for tourism services in China, a key milestone in the company's effort to increase its presence in China to support the growth of general and business aviation in the Asia Pacific region. The Reignwood Group has agreed to acquire 10 Cessna Grand Caravan EX Amphibian aircraft through the Cessna-AVIC Shijiazhuang facility to expand its aircraft services and operate tourism flights in the south-east part of China. In March 2014, CAAC granted approval for the Cessna Grand Caravan EX to operate on floats in China.

**HONG KONG-BASED PRIVATE
AIRCRAFT CHARTER AND
MAINTENANCE PROVIDER
METROJET HAS BECOME THE
FIRST AUTHORISED SERVICE
CENTRE FOR EMBRAER
LEGACY 500 AIRCRAFT
IN CHINA.**



BOMBARDIER CHALLENGER 850: THE LARGEST SUPER-MID SIZE BUSINESS AIRCRAFT; PIAGGIO P180 AVANTI ON DISPLAY

EMBRAER BAGS ORDER FOR LINEAGE 1000

Brazilian manufacturer Embraer announced that it received another order for its Lineage 1000. The order is for a single aircraft, which is scheduled for delivery to an undisclosed Chinese customer in the first half of this year, according to Ernest Edwards, President of Embraer Executive Jets. The order builds on previous successes, including an order from Minsheng Financial Leasing for five Lineages.

Also, Hong Kong-based private aircraft charter and maintenance provider Metrojet has become the first authorised service centre for the Embraer Legacy 500 aircraft in the greater China region. The two companies signed an agreement that expands the scope of the parties' previous authorised service agreement signed in 2011. Metrojet is already authorised to service several Embraer types, such as the Lineage 1000E, Legacy 650, and Legacy 600.

This agreement is further evidence of Embraer Executive Jets' effort to have comprehensive support and services in place for the first Legacy 500 enters into service in 2014. Jackie Chan, the world renowned movie star and philanthropist, will take delivery of his new aircraft in 2015 and become the first Legacy 500 customer in China.

DEER JET TO DOUBLE FBOS IN CHINA

Deer Jet, which owns four of the six Fixed Base Operators (FBOs) currently in operation on the Chinese mainland, expects to at least double that number by year-end, Deer Jet Vice President, Peng Zhang has said.

UAS EXPANDING SERVICES IN CHINA

Dubai-based UAS International Trip Support announced that it was enhancing its aircraft handling services to bridge a trip-support gap between China and Africa. UAS already has a strong presence in China, handling 25 to 50 operations per day into and out of the country. It plans to open a regional office in China next year.

"We already have a big presence in

China" said Mohammed Husary, UAS Co-Founder & Executive President. "Every day we handle 25 to 50 aircraft into and out of the country. Part of our

growth plan is to have a regional headquarters in China by 2015, similar to those we have in Houston and now Johannesburg." UAS's plan to launch a headquarters in China, coupled with its extensive network in Africa, will position the company to better support the burgeoning number of flights between the two regions.

NETJETS TO EXPAND PRESENCE IN CHINA

NetJets, the aviation business of Warren Buffett's Berkshire Hathaway Inc (BRK/A), said the Chinese market could overtake its businesses in the US and Europe as the company prepares to start mainland operations this year.

The fractional-jet company, whose clients take a stake in a plane in exchange for flight hours, expects to clear final regulatory hurdles in China in June or July, Chief Executive Officer Jordan Hansell said. NetJets will start managing private planes before introducing the fractional model.

GROWING HELICOPTER MARKET

The potential for growth of the helicopter industry in China is enormous. Last year the entire fleet (465 helicopters, 424 based in Mainland China) grew by 20 per cent and is expected to retain that level in 2014, according to the Asian Sky Group. The total number of civil helicopters is expected to touch 550 by end 2014.

AIRBUS HELICOPTERS PUBLIC DEBUT IN CHINA

Airbus Helicopters made its public debut in China for the first time since the company formerly known as Eurocopter was renamed as part of a wider restructuring that has seen other parts of its EADS parent group channel the marketing power of the Airbus brand. Airbus airliners have sold well here in the People's Republic, but then so have the "Eurocopter" rotorcraft, which still lay a strong claim to being the market leader in China. SP

LIKE AT OTHER SHOWS
WORLDWIDE, GULFSTREAM
AT ABACE TOO CREATED A
RECORD WITH THE G-280.

BERNT BALCHEN WAS ONE of America's foremost Arctic experts. Besides being a pioneer in polar aviation, a competent navigator, a skilled aeronautical engineer and a respected military leader, he was highly knowledgeable about survival in the frozen wastes of the North and South Poles. Born on October 23, 1899, in Tveit, near Kristiansand, Norway, he later became a US citizen. He always strove for excellence, and fought for freedom in the armed forces of three nations—Norway, Britain and finally the United States.

As a youngster Balchen excelled in sports. His long list of interests included athletics, boxing, marksmanship and skiing. He would have represented Norway in the 1920 Olympics but was selected for flight training and in 1921, became a pilot in the Royal Norwegian Navy Air Service. In 1925, while stationed in Spitsbergen, Norway, he gained his first experience in polar flying. He was soon recognised as a gifted pilot and selected to participate in a critical rescue mission for the missing explorer Roald Amundsen. The mission was a success.

The South Pole also lured him and on November 29, 1929, as part of the first expedition of Richard Byrd to Antarctica, Balchen became the first to pilot an aircraft over the South Pole. With him in the modified Ford 4-AT Trimotor were Harold June (co-pilot and radio operator) Ashley McKinley (photographer) and Byrd (navigator and expedition organiser). Later Balchen contributed immensely to the success of various American expeditions in Antarctica under the leadership of explorers Richard Byrd and Lincoln Ellsworth. He also became the first pilot to fly over both Poles, for which he was awarded the Harmon Trophy. His contemporaries regarded him highly as an aviator. Amelia Earhart, the first woman to fly solo across the Atlantic, wrote after her successful feat: "Please tell Bernt Balchen how deeply I appreciate all that he did to make this flight possible. Of course he is about the finest flyer and technical expert in the world but beyond that it was his confidence in my ability which helped so much."

When World War II broke out in 1939, Balchen did whatever he could to contribute to the Allied war effort.

Following the Nazi conquest of his homeland Norway, he initially served with the British and then entered the US Army Air Force. He persuaded the Canadian Government to permit the use of the airport at Toronto Island on Lake Ontario to train young Norwegians to fly. In the course of the War, over 2,500 Norwegian pilots, navigators and mechanics were trained at the various departments of this facility known as "Little Norway".



BERNT BALCHEN
(1899–1973)

On November 29, 1929, as part of the first expedition of Richard Byrd to Antarctica, Balchen became the first to pilot an aircraft over the South Pole. He later became the first pilot to fly over both Poles, for which he was awarded the Harmon Trophy.

While commanding an airfield in Greenland, Balchen engaged in some spectacular rescue missions, saving the lives of numerous American flyers whose planes had gone down on the icecap. He was also responsible for the most remarkable Arctic rescue mission of World War II. On November 9, 1942, a Boeing B-17 Flying Fortress four-engine bomber was reported lost in South-Eastern Greenland. An air search was

launched but the missing plane was spotted only on November 24 by Balchen. Finding it was just the first step since the area was not approachable by land and an aircraft couldn't land there. Supplies were airdropped to the survivors whenever a break in blizzards occurred, but their physical condition rapidly deteriorated in the intense cold. Balchen finally decided to use an amphibious aircraft and landed it on its belly in the short space available. While the co-pilot flew the sick survivors to safety, Balchen and others from the rescue party wended their way back on foot. The rescue operation ultimately lasted nearly five months and took five lives. Balchen was awarded the Distinguished Flying Cross for leading this theoretically impossible rescue mission.

In 1943 Balchen became Chief of the regional Allied Transport Command with a secret base in Scotland. Using 10 Douglas C-47s, his daring crews flew 4,399 people from neutral Sweden to the UK, always at risk of being intercepted by the Luftwaffe. He also led secret aerial missions to resupply the Norwegian resistance forces. Another important mission was on May 7, 1943, when he led a bombing raid that destroyed the sole German post in Greenland, a weather station and an anti-aircraft battery, on the East Coast of Greenland.

Bernt Balchen was a modest man who had fame thrust on him. Many a downed aviator owed his survival either directly to Balchen or to the personnel he trained in cold weather search and rescue techniques. Some of his methods are followed to this day. Apart from flying, he excelled at sketching and painting in watercolors. Through his art he introduced many people to the awesome beauty of the Arctic landscape that he deeply loved. He died in New York on October 17, 1973, of bone cancer. His tombstone read: "Today goes fast and tomorrow is almost here. Maybe I have helped a little in the change. So I go on to the next adventure looking to the future but always remembering my teammates and the lonely places I have seen that no other man saw before." SP

— Joseph Noronha

FOUNDED BY SHRI S P BARANWAL

IN 1964, GUIDE PUBLICATIONS
BEGAN ITS HUMBLE JOURNEY.

TODAY SP GUIDE PUBLICATIONS
(SP'S) IS THE ASIA'S LARGEST
PUBLISHING HOUSE FOR
AEROSPACE & DEFENCE
SECTORS.

WE AT SP'S LOOK FORWARD
TO COMING YEARS
AND DECADES
WITH EVEN STRONGER
CONVICTION.



SP GUIDE PUBLICATIONS

A large graphic for a 50th anniversary. The number '50' is rendered in a large, bold, sans-serif font. The '5' is white with a red shadow, and the '0' is white with a yellow shadow. The background of the graphic is a red and blue checkerboard pattern. The text '1964-2014' is written in white on a red horizontal band across the middle of the '50'. Below the '50' is the word 'YEARS' in white, and 'OF SP'S' is written in white on a blue background.

50

1964-2014

YEARS

OF SP'S

QUICKROUNDUP

AERO VODOCHODY

Representatives from Iraqi Defence Ministry have signed a purchase contract with Aero Vodochody for buying 12 mothballed L-159 combat planes from the Czech military at a cost of \$200 million which will be delivered by September 2014.

AIRBUS

The successful first public flight of the electric E-Fan experimental aircraft was the highlight of Airbus Group's E-Aircraft Day in Bordeaux, France. The electric E-Fan training aircraft is a highly innovative technology experimental demonstrator based on an all-composite construction. Airbus Group Chief Technical Officer Jean Botti stated, "The E-Fan project and Airbus Group's commitment to the field of electric and hybrid research show our vision of future technological developments."

Forty new aircraft from the Airbus A320neo family that the Lufthansa Group ordered in 2013 will be equipped with the quiet, fuel-efficient LEAP-1A engines from CFM International. The cutting-edge aero-engine sets new standards for noise reduction: It is significantly quieter than conventional CFM engines of the type CFM56-5B and halves the noise footprint produced by an aircraft during take-off and landing.

AGUSTAWESTLAND

AgustaWestland has announced that Saudi Aramco has placed an order for an AW139 twin-engine helicopter for offshore and VIP transport operations in Saudi Arabia, further expanding its fleet of AW-139 helicopters.

ATK

ATK has reached agreement on a \$178-million contract award as part of the US Air Force's Phase 1 Evolved Expendable Launch Vehicle (EELV) buy from United Launch Alliance. The order value also includes hardware for both of the current EELV launch vehicles, the Atlas V and Delta IV. The initial contracting period includes large composite structures with deliveries commencing in AFY14 and continuing into early AFY18.

AUSTRALIAN DEFENCE FORCE

BAE Systems, Beechcraft and CAE have developed an integrated pilot training system that fully meets the Australian Defence Force's requirements by delivering highly cost-effective training for its AIR 5428 project. The team has offered this proven system that focuses on delivering advanced skill levels, reducing training times and improving productivity.

Lockheed Martin Australia and Pilatus Aircraft, supported by Hawker Pacific, have jointly launched a bid to provide a new pilot training system for the Australian Defence Force. The consortium, known as Team 21, has submitted its proposal for the AIR 5428 Pilot Training System under which the Australian Defence Force pilots will graduate from a proven training system tailored to Australian requirements.

MILITARY ASIA PACIFIC

CHINESE DELEGATION IN DELHI



Lieutenant General Qi Jianguo, Deputy Chief of General Staff (Operations), PLA China, arrived in New Delhi on April 22, 2014, along with an eight-member delegation for a two-day visit on the invitation by the Government of India. During the official talks with the Chinese delegation, the two sides exchanged views on various issues of mutual interest such as maintenance of peace and tranquillity along the Line of Actual Control and enhancing mutual cooperation and understanding between the Armies of India and China. Measures for implementation of existing Bilateral Agreements were also discussed. Both sides agreed on the need to enhance bilateral military engagements. The Chinese side have confirmed their participation in the Fourth India China Joint Training Exercise scheduled to be held in November 2014 in India. The PLA delegation also called on the Chairman Chiefs of Staff Committee and the Chief of Army Staff, General Bikram Singh and the Defence Secretary. India and China attach great importance to high level military exchanges. 2014 has also been declared as "Year of Friendly Exchanges". The Chinese side have also confirmed the visit of their Defence Minister General Chang Wanquan to India later this year.

T-50 FIGHTER TO BE FITTED WITH RADIO-ELECTRONIC SYSTEM HIMALAYA (RUSSIA)

According to the RIA Novosti report, the latest radio-electronic warfare station Himalaya for the T-50 will soon be delivered the Stavropol Radio Factory Signal. According to the news agency, the serial supplies of the fifth-generation fighter T-50 will begin in 2016. The electronic warfare station is one of the key elements of the project. The Russian Air Force got the first T-50 for testing last winter. Currently, only the US has fifth-generation fighters, the F-22 and F-35. According to the Agency, the electronic warfare package for the T-50 has much smaller dimensions than the previous generation station. Concern

Radio-Electronic Technologies is a part of the state corporation Rostec.

INDIA'S AN-32 AIRCRAFT FLEET UPGRADE

India was the An-32's launch customer in the 1980s and its fleet of about 105 aircraft have taken a toll due to its long service thus a decision was taken during 2006 to upgrade over 100 planes. Antonov and Israel's Elbit Systems were said to be the likely contractors, with the latter playing a role as an equipment supplier. The Ukraine's Motor Sich was to work on upgrades to the engines. The formal announcement cited the Ukraine's state agency Spetstechnoexport as the contract winner, but the Antonov Plant and Civil Aviation Plant 410 are actually executing the contract. The \$400 million main project envisages a Total Technical Life Extension for 40 aircraft at Antonov-certified plants in Ukraine, at the rate of 10 aircraft per year. It also includes the supply of material and transfer of technology for the upgrade of remaining 64 aircraft at the IAF's No. 1 Base Repair Depot, Kanpur. The Antonov An-32 "Cline" builds on the general design of the widely-used An-26 light transport plane, but high placement of the engine nacelles above the wing allow bigger propellers, driven by 5,100 hp AI-20 turboprops that almost double the output of the An-26's engines. The 7th batch of five upgraded An-32REs have been flown to India during end of March and the final set of five are scheduled for delivery in summer 2014. 1BRD is scheduled to complete the remaining upgrade by March 2017.

"SIACHEN PIONEERS" CELEBRATE GOLDEN JUBILEE



114 Helicopter Unit (HU), also known as the "Siachen Pioneers", celebrated its Golden Jubilee at Leh on April 5 with two-day-long celebrations attended by senior Indian Air Force officers, ex and retired Siachen Pioneers and Army officers from local formations. The occasion was marked by the maiden visit of 114 HU Commodore Commandant, Air Commodore P.K. Sharma. Also present on the occasion was the previous Commodore Commandant AVM M. Bahadur (Retd). He

has a distinction of being part of the crew of the first ever helicopter landing in the Siachen Glacier in a Chetak helicopter on September 20, 1978. 114 HU has been engaged in "Operation Meghdoot" for over three decades now. It routinely involves landing at the highest helipads in the world located in the Siachen Glacier. For its courageous deeds, the Unit has earned 62 Gallantry/Presidential awards that include four Vir Chakras, seven Shaurya Chakras, 27 Vayu Sena Medals (Gallantry), 12 Vayu Sena Medals, five Yudh Seva Medals, three Vishisht Seva Medals and four Mention-in-Despatches.

ADDITIONAL F-35 JOINT STRIKE FIGHTERS FOR AUSTRALIA

The Australian Government has approved the acquisition of an additional 58 F-35 Lightning II Joint Strike Fighter aircraft. The fifth-generation F-35 is the most advanced fighter in production anywhere in the world and will make a vital contribution to national security. Together with the Super Hornet and Growler electronic warfare aircraft, the F-35 aircraft will ensure Australia maintains a regional air combat edge. The F-35 will also provide a major boost to Australia's intelligence, surveillance and reconnaissance capabilities. The first F-35 aircraft will arrive in Australia in 2018 and enter service with the Royal Australian Air Force in 2020. Australia has been working with the US as a partner in the Joint Strike Fighter programme since 2002. Acquiring F-35 aircraft will reinforce the Australia's defence forces ability to operate seamlessly with US forces and Australia's capacity to continue supporting their shared strategic interests under the US alliance. The total capital cost of \$12.4 billion for this acquisition includes the cost of associated facilities, weapons and training. The F-35 will replace the F/A-18A/B Classic Hornet aircraft. With this order Australia will acquire 72 F-35s.

AMERICAS

NORTHROP GRUMMAN FLIES FIRST PRODUCTION SMART NODE POD

Northrop Grumman Corporation has completed a series of flight tests demonstrating the first production Smart Node Pod for the US Air Force. Smart Node Pod is an aircraft-mounted airborne communications system that allows real-time information to be exchanged among many disparate military and commercial radios and different data links, extends the network to the forward edge of the battlefield and relays full-motion video.

During the flights, the Smart Node Pod demonstrated the ability to transmit full-motion video, imagery, voice and digital messages between war-fighters both in the air and on the ground via various waveforms and data links and its interoperability with the proprietary and open source forward tactical handheld devices.

ALL F-22S TO HAVE BACKUP OXYGEN SYSTEMS



A senior US Air Force acquisition officer has said that a full installation of automatic backup oxygen systems on the F-22 fleet is expected to be completed by this time next year. Raptors in Alaska have already begun using the system. The US Air Force has already awarded more than \$30 million in multiple contracts to Lockheed Martin to install the systems following a grounding and multiple high-profile reports of pilots experiencing hypoxia-like symptoms while flying the F-22, including a fatal November 2010 crash of a jet based at Joint Base Elmendorf-Richardson, Alaska. Most of the current backup oxygen systems in the F-22 fleet require activation by the pilot, which might not be possible in the case of extreme hypoxia-like symptoms, such as a pilot blacking out.

EUROPE

AIRBUS ZEPHYR REACHES NEXT LEVEL

Airbus Defence and Space has announced that it has launched the Zephyr 8 programme to develop the next generation of the world-record setting Zephyr 7 system and invites potential customers and partners to undertake joint in-flight demonstrations of their payloads and applications. Zephyr is a High Altitude Pseudo-Satellite. Running exclusively on solar power and flying at high altitudes above the weather and above conventional air traffic, it fills a capability gap between satellites and UAVs. It allows focus on a specific area of interest (which can be hundreds of km wide) while providing it with satellite-like communications and Intelligence, Surveillance and Reconnaissance services over long periods of time without interruption.

QUICKROUNDUP

BAE SYSTEMS

BAE Systems Electronic Solutions, Nashua, has been awarded a \$4,73,52,248 indefinite-delivery/indefinite-quantity delivery order contract for the manufacture of the transmitter countermeasures T-1687A/ALE-70 (V) in support of the joint strike fighter programme. Work will be completed by April 2017.

BOEING

Boeing has delivered on April 16, the 8,000th 737 to United Airlines, marking another important milestone for the world's best-selling airplane. The airplane, a next-generation 737-900ER features a special logo.

Boeing has adjusted slightly the timing for ending C-17 Globemaster III production and closing its Long Beach, California, C-17 final assembly facility after a successful two-decade production run of the world's premier airlifter. Boeing anticipates completing C-17 production in mid-2015, an adjustment of approximately three months from an initial estimate of late 2015.

US Navy procurement of the E/A-18 Growler electronic warfare aircraft ends in fiscal year 2014, and Boeing expects to deliver existing orders of Super Hornets and Growlers as early as 2016. A company executive has said that unless more orders are placed, Boeing Co., will have to shutter the F/A-18 production line within two years.

China's Shandong Airlines has said that it has placed an order for 50 Boeing 737 aircraft, worth \$4.6 billion at list prices. When contacted, Boeing said it had received an order from the airline, but refused to confirm the number of planes. The order still needs to be approved by the Chinese Government.

BOMBARDIER

Bombardier Aerospace has announced that a customer in the Middle East and Africa region, who has requested to remain unidentified at this time, has placed a firm order for two Q400 NextGen turboprop airliners valued at approximately \$62 million.

ELBIT SYSTEMS

Elbit Systems Ltd has announced that it has been awarded an approximately \$123 million contract from a European country for the supply of defence electronic systems for airborne applications. The contract will be performed over a four-year period.

FRENCH AIR FORCE

Within two-and-a-half months after its induction, the French Reaper UAV detachment has crossed the 500 flight hour milestone in support of Operation Serval being carried out by the French Forces in Mali.

QUICKROUNDUP

During this period, Reaper has demonstrated its capabilities for providing reliable identification, surveillance, reconnaissance information.

HINDUSTAN AERONAUTICS LTD

HAL received the "Most Efficient Navratna 2013" award at the fifth Dalai Street Investment Journal Awards night held in New Delhi on April 2. HAL Chairman Dr R.K. Tyagi received the award from the jury. HAL has notched-up the highest ever turnover of ₹15,180 crore for the FY 2013-14 surpassing the previous year's figure of ₹14,324 crore.

ISRAELI DEFENSE MINISTRY

The Israeli Defense Ministry has announced that Israel has launched its tenth satellite into space on March 9. The satellite, known as Ofek 10, is one of a group of reconnaissance satellites that gather information for military purposes. According to the IDF's data, each satellite makes about 800 reconnaissance orbits a year for a total of 64,000 minutes annually.

LOCKHEED MARTIN

A US Air Force crew ferried the 18th C-5M Super Galaxy to Dover Air Force Base, from the Lockheed Martin facilities making Dover the first base with a complete C-5M Super Galaxy fleet. The C-5M is the only true strategic airlifter capable of covering the entire globe in one unrefuelled flight. A total of 52 Super Galaxy aircraft are scheduled to be delivered to the US Air Force by 2018.

Lockheed Martin Aeronautics Co has been awarded a \$5,45,74,234 modification to a previously awarded fixed-price-incentive-fee, cost-plus-incentive-fee contract for production non-recurring technical assistance in support of the F-35 Lot VII effort for the US Navy, US Air Force, and international partner governments.

NORTHROP GRUMMAN

Northrop Grumman Corporation will build five additional US Navy MQ-8C Fire Scout unmanned helicopters, which allow ship commanders to extend their intelligence-gathering capabilities far beyond the horizon. The MQ-8C is based on a larger helicopter airframe that provides greater range, endurance and payload capacity over the currently fielded MQ-8B Fire Scout variant.

PAKISTAN AIR FORCE

A first batch of five F-16 fighters were added to the fleet of Pakistan Air Force (PAF) on April 27. Air Chief Marshal Tahir Rafique Butt said that addition of new fighter aircraft would increase the capacity of the PAF while speaking at the PAF Base Mushaf in Sargodha where the force received its first batch of five F-16 fighter jets from Jordan. 13 used PAF jets were purchased from Jordan due to financial constraints.

RAYTHEON

The US State Department is likely to approve a possible Foreign Military Sale to Korea for AIM-9X-2 Sidewinder

RÉUNION ISLAND HOSTS RAFALE FOR THE FIRST TIME

For the first time since its service introduction, the Rafale has flown over Réunion, a French territory in the Western Indian Ocean. As part of a long-range projection training mission, the French Air Force's Detachment 181 "Lieutenant Roland Garros" based at Saint-Denis, the capital of La Reunion, welcomed the flight formation from April 22-25. The formation comprised a C-135 tanker and two Rafale B two-seaters. The aircraft took off from Istres at 5 a.m. on April 22, landed in mid-afternoon of the same day at Saint-Denis, after a flight lasting 10 hours and 35 minutes for the Rafales (including 5 in-flight refuellings) and 11 hours for the C-135 tanker. It demonstrates the ability of French strategic air forces to intervene anywhere. In-flight refuelling support, provided by the C-135FR, allows combat aircraft belonging to the Air Force and to our allies, as well as the AWACS airborne radar aircraft, to carry out their missions thousands of miles from their home bases.

FULLY CONFIGURED MC-27J MULTI-MISSION TACTICAL TRANSPORT AIRCRAFT COMPLETES FIRST FLIGHT



Alenia Aermacchi, in partnership with ATK, has announced that the demonstrator of a fully configured MC-27J multi-mission tactical transport aircraft has completed its first flight from the company's Turin Test Flight Centre. The demonstrator aircraft was modified with an L-3 Wescam MX-15Di Electro-Optical and Infrared Turret and is optimized for Intelligence, Surveillance and Reconnaissance, and Search and Rescue missions. Link-16 data link software and hardware provisions will prepare the aircraft for the ATK palletised mission system installation. The installation of both the ATK developed modular roll-on/roll-off mission and weapon system, and a modified side door for the GAU-23 30mm cannon installation will be completed in May. In June 2014, a new series of flight tests, including firing the side-mounted cannon, will be completed.

SHOW CALENDAR

20-22 May

EBACE 2014

PalExpo, Geneva, Switzerland
www.ebace.aero/2014

20-25 May

ILA BERLIN AIR SHOW

Berlin ExpoCenter Airport, Berlin, Germany
www.ila-berlin.de/ila2014/home/index.cfm

22-24 May

HELIRUSSIA 2014

IEC Crocus Expo, Moscow
www.helirusia.ru/en

28-29 May

CHINA AEROSPACE PROPULSION TECHNOLOGY SUMMIT 2014

Chengdu, China
www.galleonevents.com/CAPS2014/en/home.html

30 May-1 June

AEROEXPO UK 2014

Sywell Aerodrome, Northamptonshire, UK
www.aeroexpo.co.uk

3-4 June

HELI UK EXPO

Sywell Aerodrome, Northamptonshire, UK
www.heliukexpo.com

12-14 June

CANNES AIRSHOW

Cannes-Mandelieu Airport-LFMD, Cannes, France
www.cannesairshow.com

17-19 June

CANADIAN BUSINESS AVIATION ASSN CONVENTION AND EXHIBITION

Edmonton International Airport, Edmonton, Alberta, Canada
www.cbaaconvention.com

19-21 June

AVIATION EXPO EUROPE

Hradec Králové Airport, Czech Republic
www.aviationexpoeu.com

23-25 June

MRO MEETINGS SOUTH EAST ASIA MECC MANAGEMENT OFFICE, Kuala Lumpur, Malaysia

www.mromeetings.com

14-20 July

FARNBOROUGH INTERNATIONAL AIRSHOW

Farnborough Airport, Farnborough, U.K.
www.farnborough.com

APPOINTMENTS

INDIAN AIR FORCE

Air Marshal S.B.P. Sinha took over as the Deputy Chief of the Air Staff at Air Headquarters on April 30, 2014.

RAYTHEON

Raytheon has appointed Thomas A. Vecchiolla as President, Raytheon International, Inc., effective immediately.

BOMBARDIER

Bombardier has announced key leadership changes in its Parts Services Team. Bill Molloy has been appointed Vice President of Parts Services. Stéphane Hébert will succeed Molloy as Director, Customer Services & Support, CSeries Program.

HONEYWELL AEROSPACE INDIA

Pritam Bhavnani has been named President, India and High Growth Regions. Arijit Ghosh has replaced Pritam Bhavnani as President, Honeywell Aerospace India.

GULFSTREAM AEROSPACE CORP

Gulfstream Aerospace Corp has named Tony Swift its First Field Service Representative (FSR) in Africa

AIRBUS GROUP

Airbus Group has announced key management appointments at Airbus Helicopters, Aerolia and Airbus Defence and Space. Christian Cornille joins Airbus Helicopters as Executive Vice President - Industry Cédric Gautier to succeed Cornille as CEO of Aerolia Rafael Tentor to manage the A400M programme at Airbus Defence and Space.

BOEING MILITARY AIRCRAFT

Boeing named four executives to new leadership positions in its Boeing Military Aircraft (BMA) business unit. David Koopersmith is named Vice President and General Manager for Vertical Lift. Kim Smith replaces Koopersmith as Vice President of Attack Helicopter Programs and AH-64 Apache and AH-6 Program Manager. Chuck Dabundo is appointed Vice President, BMA Engineering and BMA Chief Engineer. Stephen Parker is promoted to Vice President, Cargo Helicopters and H-47 Program Manager.

BAE SYSTEMS

BAE Systems Applied Intelligence has named Jim Anderson as President for the Americas region.



QUICKROUNDUP

Missiles and associated equipment, parts, training and logistical support for an estimated cost of \$98 million. The principal contractor will be Raytheon Missile Systems Company.

ROLLS-ROYCE

Azul Brazilian Airlines has become a new Rolls-Royce customer with the announcement that it is to operate 11 Trent-powered Airbus aircraft. The airline has also signed an agreement worth \$400 million for TotalCare engine service support.

Rolls-Royce has been awarded \$39 million to support AE-1107C engines for V-22 aircraft operated by the US Marine Corps and Air Force for 2014-15. The Rolls-Royce MissionCare contract, a modification of a prior agreement, includes repairs and support services.

RUSSIAN DEFENSE MINISTRY

The Russian Defense Ministry has signed a \$470-million contract with the MiG Corporation for the delivery of 16 advanced MiG-29 SMT fighters. The MiG-29 SMT, developed in the first half of the 2000s, features add-on fuselage fuel tanks for extended range, special radar-absorbing paint and can be outfitted with supersonic and anti-ship missiles.

SAAB

Saab has successfully performed the first flight with the new Infra Red Search and Track sensor (IRST) which will feature in Gripen E, according to schedule. The IRST does not emit a signal and can, without revealing the aircraft's own position, silently detect, track and identify all types of targets.

US

The US State Department has made a determination approving a possible Foreign Military Sale to Mexico for 18 UH-60M Black Hawk Helicopters and associated equipment, parts, training and logistical support for an estimated cost of \$680 million.

US AIR FORCE

The top three acquisition priorities for the US Air Force are the KC-46A aerial tanker, the F-35A Joint Strike Fighter and the Long Range Strike Bomber, officials told members of Congress during a hearing of House Armed Services Committee's subcommittee on seapower and projections forces.

US Air Force officials have announced the two bases selected to house and operate the KC-46A Pegasus aircraft, which will replace the KC-135 refuelling tanker. Altus Air Force Base has been selected as the KC-46A's formal training unit, and McConnell Air Force Base, is the first active duty-led Pegasus main operating base.

INDUSTRY EUROPE

SELEX ES SUCCESSFULLY DEMONSTRATES BRITCLOUD DECOY

Selex ES, a Finmeccanica company, has successfully carried out multiple end-to-end tests of its BriteCloud Expendable Active Decoy. The successful tests have also cleared the way for their production. BriteCloud is a self-contained Digital RF Memory (DRFM) jammer for fast jet aircraft, providing an off-board capability to decoy RF-guided missiles and fire control radars. During the tests, fully functional decoys were launched from a fighter aircraft that was being tracked by a ground-based fire-control radar. All of the decoys performed as planned, on each occasion detecting the threat radar and jamming it with the decoy's embedded DRFM jammer. BriteCloud was launched by Selex ES in November 2013 jointly

with its launch partner Saab who is offering the decoy as an EW enhancement option with its entire range of Gripen jets.

SPACE EUROPE

ARIANESPACE BOOSTS SENTINEL-1A EARTH OBSERVATION SATELLITE INTO ORBIT

On April 3, 2014, Arianespace successfully carried out the seventh Soyuz mission from the Guiana Space Center (CSG), orbiting the Sentinel-1A satellite for the European Commission within the scope of a contract with the European Space Agency (ESA). Launched as part of the European Commission's Copernicus programme, the Sentinel-1A satellite will play a decisive role in meeting Europe's environmental monitoring and security requirements. In particular, it will contribute to observation of the terrestrial and maritime environments. •

INSPIRE THE DISSUADED BIZAV IN INDIA

THERE APPEARS TO BE a confrontation of sorts building up between the Business Aircraft Operators Association (BAOA) and the Directorate General of Civil Aviation (DGCA). A three-year old body dedicated to promote business aviation in India, BAOA represents business aircraft and charter operators as also owners of maintenance, repair and overhaul facilities – in fact practically everyone in the Indian aviation industry other than the scheduled operators. BAOA has now confronted the DGCA for their onslaught against business and general aviation operators.

In January this year, the US Federal Aviation Administration (FAA) downgraded India's aviation safety ranking from Category I to Category II laying bare the gross inadequacy of the DGCA to ensure safe air travel. This, action on the part of the FAA was triggered primarily by a shortage of qualified staff for conducting safety and airworthiness checks of Indian carriers. This, however, was not an overnight development as following an inspection a few years ago, the FAA had indeed cautioned the Indian regulator of the possibility of downgrade if the inadequacies observed by the former were not addressed expeditiously. The focus of the FAA was on the poor safety oversight mechanism that the DGCA had in place for the Indian carriers and not on operators in the business and general aviation segments of the industry. Those affected most by the downgrade are primarily the full service carriers such as Air India and Jet Airways who cannot add more flights to the US or enter into code share agreements with international carriers. However, some of the low-cost carriers will also be affected as these have now become eligible to operate in the international segment. Business and general aviation in India was apparently not in the sights of the FAA.

Possibly as a fallout of the downgrade by the FAA, DGCA appears to have been rather suddenly galvanised into action and have begun carrying out random safety checks on business and general aviation aircraft as well. This action by the DGCA comes at a time when business aircraft including helicopters are in great demand countrywide for charter by political parties to ferry their leaders across the nation on poll campaign. In the recent past, the media carried reports of a number of cases of business aircraft that were inspected by the DGCA and found to be non-compliant with the regulations pertaining to the stipulated minimum levels of safety requirements. The BAOA views the initiative at selective

leaks to the media by the DGCA as an effort to rather unfairly target business and general aviation aircraft operators and as "diversionary tactics to grab undue media attention in order to shift the focus away from their own shortcomings".

This whole issue has been a cause for consternation and dismay amongst business aircraft operators as the environment in which business and general aviation operators in India are required to function, is not only unfriendly but extremely hostile. The procedure for the issue and renewal of an Air Operator Permit (AOP) has been laid down in a document entitled CAP 3100. Revised in August 2013, members of the BAOA find the process of acquiring an AOP or even its renewal to be an "extremely frustrating" experience. BAOA is of the view that the CAP 3100 is in itself questionable and not quite relevant to general aviation. For a new entrepreneur it may take several years to obtain an AOP and that too after the arrival of the aircraft into the country. The enormous losses that the prospective operator suffers on this account is of no concern to the regulator who is neither efficient nor accountable. BAOA also believes that CAP 3100 has provided "subjective power in the hands of DGCA officials, some of whom are taking undue advantage of it".

What the government and the DGCA need to appreciate is that business aviation is a vital management tool for the corporate world and ought not to be perceived merely as personal indulgence and corporate excess. BAOA has been working on the DGCA to restructure the regulatory framework and incorporate specific regulations for business and general aviation as well as create a roadmap for its growth for the next 10 to 20 years. The industry is fully prepared to cooperate with DGCA in this effort.

Tragically, business and general aviation in India is not growing as it should, in fact this segment of the Indian aviation industry has been witnessing negative growth, the malaise being attributable to an oppressive policy framework and excessive control by the government. It is high time that DGCA gets its act together and come formulate rules and regulations dedicated to business and general aviation. These must be pragmatic, easy to comply with and inspire growth of the industry instead of proving to be a harassment for the operators and detrimental to aviation in general. SP

*—By Air Marshal (Retd)
B.K. Pandey*



Regulations must inspire growth of the industry instead of being detrimental to the interests of aviation in general.

Indispensable

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SP'S MILITARY YEARBOOK 2014- 2015

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42ND ISSUE

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