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BIZAV INDIA

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ITS BESPOKE APPROACH IN AVIATION-DESIGN

COMING SOON

SP'S CIVIL AVIATION YEARBOOK 2020-21

FIRST OF ITS KIND

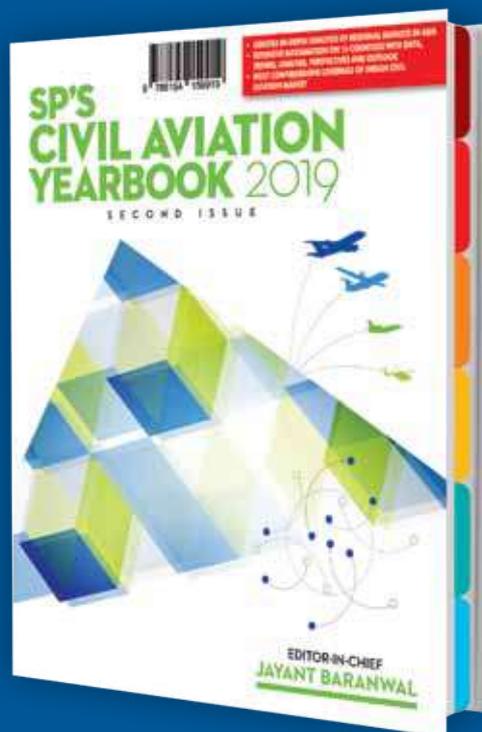


ALAN PEAFORD,
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Reviews

SP'S CIVIL AVIATION
YEARBOOK 2019

"Guide to Asian aviation in one book. 2019 edition has expanded its reach to cover the various sub markets across the whole of the Asian continent from Saudi Arabia in the west to Japan in the East....."



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ON THE COVER:

A Sparkling Jet by Gulfstream:
The core of aviation design at Gulfstream includes the micro-detailing across the interiors, created with inputs provided by the owners and in-house design team.

Cover Photograph
Gulfstream / Twitter

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Getting adept at navigating our way through the new normal, aided by the gradual acceleration in vaccines, the signs for revival of travel and aviation industry are beginning to appear closer

Dear Reader,

At the first-ever virtual EBACE Connect, industry leaders strongly displayed the eagerness to embrace the future by shifting focus on new opportunities with reinvention as the remote technologies are likely to continue. These global executives spoke on important topics, trends and developments in the outlook for the industry, some of which are highlighted in a report in the magazine. Ayushee Chaudhary reports on the virtual conference in this edition.

Building on the positive fervor of the industry, in an exclusive conversation with *BizAvIndia*, Tray Crow, Gulfstream's Director of Interior Design revealed the manufacturer's approach towards aviation-design highlighting the customisation of each step of the process, from the floor plan to selecting materials to the final delivery.

Even though the entire world has not yet resumed activities and new variants as well as successive waves of the virus continue to keep the uncertainty high, the overall industry is still resilient. The positive attitude has especially been observed in the BizAv market with more people considering business travel. In this regard, notable gains have been observed in the US, with business aviation activity up by 37 per cent this year compared to the first four and a half months of 2020. A report on the same by Ayushee Chaudhary is included in this edition.

Air Vice Marshal S.S. Chauhan (Retd), President, BAOA brings to notice the sizable expenditure incurred on account of aircraft maintenance in lieu of the pandemic. In a report about the MRO sector, he also points out the need for an expert technical committee to protect & promote the overall national MRO interests.

Shifting the focus from regular flights, Group Captain C.J. Weir (Retd) shares the potential of Vertical Business Jet that will reduce dependence on traditional infrastructure requirements whilst dramatically increasing its deployment possibilities, the challenge however is to integrate various cutting edge technologies to have an economically viable aircraft. He stated that India is one region where the VBJ will find a large market. In addition to that Sudhir Rajeshirke talks about Automatic Dependent Surveillance-Broadcast (ADS-B) Air Space Management Solution for Safer and Efficient Travel within Air Traffic Services (ATS), its implementation timelines, and benefits including how India prepared for the same, is included in this issue.

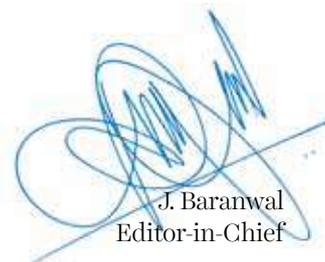
All this and much more in this issue of *BizAvIndia*. Welcome aboard and we wish you many happy landings!

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J. Baranwal
Editor-in-Chief



PRESIDENT



BUSINESS AIRCRAFT OPERATORS ASSOCIATION

Reduce Operating Costs by Developing In-house Maintenance Facilities!

The indigenous expertise gained through setting up of such in-house maintenance facilities over a period of time would prove to be invaluable and would undoubtedly result in lowering the cost of operations of aircraft and also reduce their prolonged downtime

That both the 'First Pandemic Wave' last year, followed by the more devastating 'Second Wave' this year, have left the Indian Aviation Sector brutally hurt & crippled does not need any supporting documents & proof! For sheer survival, since at times, revenue-side may have serious limitations or be controlled hopelessly by such mis-happenings, one needs to introspect & see whether the expense-side in some areas could have been better managed with foresight. One of such areas, not essentially the only area, pertains to the sizable expenditure incurred on account of aircraft maintenance.

Since Independence in the year 1947, the grass-root level development of the Aviation Sector in India has received only secondary attention, in comparison to the 'State Aviation Policies' aggressively conceived and implemented by the present day aviation-technology-rich countries such as USA, USSR, Europe, Australia, Japan, Israel, Singapore, etc. In the recent past, after more than six to seven decades of attaining independence, there has been some awakening in the Indian establishment on this account, but even that is considered to be still well short of what it ought to have been! In the elapsed period, other big & small nations illustratively mentioned above have consolidated & thereafter, slowly but progressively, tightened their grip over basic/core aviation technologies, which now our country needs but has to bargain hard, & yet, in most cases, end up purchasing the essential requisites at an exorbitant cost. A typical case of exploitation by 'The HAVES' of 'The HAVES NOT'!

Indian aviation sector consists of the 'Biggies' such as the 'Scheduled Airlines' and the 'Smallies' such as the 'Non-Scheduled /Charter/Private Operators'. All are quite fragmented till date, by & large driving their own isolated, independent agendas. This has been more marked in the recent past when survival of some or most of the individual entities has been at high stakes. There never was and likely, that in the near future there may not be, a "Unified National-level Platform" consisting of both the 'Biggies' and the 'Smallies' to jointly take up common vital issues that affect all aviation operators. Apparently the much-needed formal institution such as an 'Aviation Think Tank', seen as real operating functional entities in some aviation-technology-rich countries to guide their national policies, does not exist here. As a small consolation, however, the 'Smallies' do have the "BAOA" (Business Aircraft Operators' Association) as a, now more than decade-old, all-purpose singular platform, to selectively take up operational, maintenance, handling and miscellaneous issues affecting only the BA/GA operators, piece-meal taking up perceived problems for a possible resolution through formal representations & discussions with the country's concerned civil aviation authorities.

MESSAGE FROM PRESIDENT, BAOA

“Aircraft Maintenance” in particular is a large expense component in actual cost of aircraft operations but mostly has not received the deep-rooted attention due to it, both through forward planning processes, blue-printed and financially controlled by the aircraft (fleet?) owners, as well as through drafting & issue of the aviation policies & planning at regional/national level. The highly developed aviation production centres abroad, selling aircraft hardware & technologies to countries that did not strengthen and develop their own aviation infrastructures over decades, have progressively tightened their grip over the technology-deficient nations, dictating most unreasonable prices & terms for sale of maintenance-related aviation goods & services, without which continued operation of the aircraft fleet on hand, both of the Biggies and the Smal-lies, cannot be sustained.

Following suggestion is made for due consideration by the aviation authorities at the apex national level:

Aircraft, Engines and Accessories import deals may, every now and then, run into millions or billions of dollars in one go. The permission to import such high value Aircraft, Engines and Accessories, in deals negotiated by the interested Scheduled/Non-Scheduled Operators, is finally given by the Government of India through its designated agencies. As a pre-condition to any such high-value import, the OEM (Original Equipment Manufacturer) of the aircraft /engine(s)/accessories, as the case may be, must commit in the sales contract/agreement to plough-back a part of the transaction value in setting up reasonable quantum of the supporting maintenance facilities in India. This would be mutually defined in the shape of a mandatory ‘Offset Clause’ in these high value contracts. This course of action, involving inter-action with well-entrenched entities at international level, is likely to be initially resisted, but is considered most essential to be imposed in the long-term national interests. This may also, to some extent, slow down some processes & approvals in the initial stages, but as the saying goes, ultimately ‘Slow & Steady Wins the Race!’ Over a period of time, even drop by drop, one day into the future the bucket may be quarter- or half- or even nearly-full. The indigenous expertise so gained, through setting up of such in-house obligatory maintenance facilities established over a period of time, would prove to be an invaluable national asset and would undoubtedly result in not only the lowering of the overall cost of operations of aircraft but also reduce their prolonged downtime due to the current foreign-technology-dependent maintenance issues. [BAI](#)

JAI HIND!

AVM S.S. Chauhan (Retd)
PVSM AVSM VSM
President, BAOA.



BizAv Leaders Present Perspective Post-Pandemic at EBACE Connect

BY **AYUSHEE CHAUDHARY**

Titled, the “lightning round”, the first-of-its-kind keynote presentation, featured views from nine Presidents and CEOs from various OEMs who addressed the 2021 market.



“AT THIS PIVOTAL MOMENT, WE CAME TO EBACE CONNECT TO PLAN FOR POST-PANDEMIC GROWTH. THIS MADE CLEAR, BUSINESS AVIATION IS FOCUSED ON MUCH MORE THAN RETURNING TO NORMAL – OUR INDUSTRY IS EVOLVING, COMING BACK STRONGER, MORE ADAPTIVE AND MORE INNOVATIVE THAN EVER.” —ED BOLEN, NBAA PRESIDENT AND CEO

BENOIT DEFFORGE, PRESIDENT, AIRBUS CORPORATE JETS



PHOTOGRAPHS: Airbus



(ABOVE) JAMES DETWILER, PRESIDENT, BOEING BUSINESS JETS;
(RIGHT) ÉRIC MARTEL, PRESIDENT AND CEO, BOMBARDIER BUSINESS AIRCRAFT.

WE ARE ALL ACCUSTOMED to the new normal of the hybrid and majorly virtual world that the pandemic has served us. The regular meets and airshows that the aviation industry harboured upon have also gone digital with a lot of major conferences and shows happening virtually. Recent in the line was the first-ever EBACE Connect which was a strong demonstration of the international business aviation (BizAv) community’s eagerness to embrace the future, and shift focus on new opportunities with resilience and reinvention. EBACE Connect was presented by the European Business Aviation Association (EBAA) and the National Business Aviation Association (NBAA) to bring the BizAv community together and share their vision for the future.

“At this pivotal moment, we came to EBACE Connect to plan for post-pandemic growth. This made clear, business aviation is focused on much more than returning to normal – our industry is evolving, coming back stronger, more adaptive and more innovative than ever,” said NBAA President and CEO Ed Bolen.

While various significant indicators were witnessed through the event, one of the key highlights was the coming together of leaders from across business aviation to offer a virtual update in lieu of the one they would normally deliver in person at the annual Euro-



THE EXECUTIVES ALSO UNDERLINED THAT SAFETY HAS BECOME THE TOP MOST PRIORITY WHICH IS ANOTHER STRONG ASPECT OF BUSINESS AVIATION AS COMPARED TO THE COMMERCIAL ONE

pean Business Aviation Convention & Exhibition (EBACE), hosted by EBAA. Titled, the “lightning round” of optimism and progress, the first-of-its-kind keynote presentation, moderated by Bolen, featured views from nine Presidents and CEOs from various OEMs (Original Equipment Manufacturers) who addressed the 2021 market, and the opportunities borne from a challenging year.

PANDEMIC PICTURE

The executives spoke on some important topics, trends and developments in

PHOTOGRAPHS: Boeing, Bombardier



(ABOVE) ÉRIC TRAPPIER, CHAIRMAN AND CEO OF DASSAULT AVIATION; (LEFT) DIDIER KAYAT, CEO, DAHER.



While Gulfstream Aerospace Corporation's President, Mark Burns highlighted the three elements where Gulfstream shifted its focus for success, "First was the health and safety of our customers & employees, then analysing how to continue operating as a business, ensuring we are good stewards, and to acknowledge that people have started to reassess their choices as more people now understand the value of business aviation. We have first time buyers and new customers since the pandemic."

Bombardier's President and CEO, Éric Martel also reaffirmed this shift stating that last year it was only a theory that people will be attracted more towards private aviation but now it is the truth. He also mentioned that last year was when Bombardier decided to become a purely business jet company, so the year was surely challenging but holds promise for the future.

PHOTOGRAPHS: Dassault Aviation, EBACE Show Management, Daher

the outlook for the industry and put out the belief that the remote technologies are likely to continue. Responding to the occurrence of the pandemic, Benoit Deforge, President, Airbus Corporate Jets noted how much they really missed seeing their customers face to face. "Another thing we learned is that the private aviation industry is quite resilient," he said. Éric Trappier, CEO, Dassault Aviation underlined that while no one was prepared for this pandemic, thanks to the digital tools things could continue and companies could resume work with some shifts and safety protocols in mind.



HOWEVER, THEY DID NOTE THAT DIFFERENT QUARANTINE RESTRICTIONS IN DIFFERENT PLACES DO BECOME A CHALLENGE AND THEY HOPE THOSE CAN BE STREAMLINED

COLLABORATIVE & SUSTAINABLE APPROACH

The leaders also articulated the benefits of business aviation that has come out as one of the significant outcomes of the pandemic. They mentioned about the changing perspectives of the customers, reassessing regulations, and other observations.

Talking about some perks of private aviation which people are noting, Michael Amalfitano, President and CEO, Embraer said, "You can traverse three cities in one day, disclose your personal business on



(ABOVE) MICHAEL AMALFITANO, PRESIDENT AND CEO, EMBRAER EXECUTIVE JETS;
(RIGHT) MARKUS BUCHER, CEO, PILATUS BUSINESS AIRCRAFT.

a private jet and securely work on confidential materials in flight, whereas you do not have that option when flying commercial.”

The executives also underlined that safety has become the top most priority which is another strong aspect of business aviation as compared to the commercial one. In addition to that the things like cabin air and just the overall physiology of a private aircraft make the trip way more convenient which in turn enhances the productivity of the person. They also noted the importance of training, as well as the diversity that they maintain in the organisations that allows them to better understand the global disbursement of their customer population. The session also highlighted, as more people are noticing the advantages of flying private, the customers themselves are becoming the advocates of the industry.

Ron Draper, President and CEO, Textron Aviation mentioned about the Sky campaign that Textron introduced last summer which was well received and since then Textron has been seeing new entrants in private aviation.

“We have dedicated meetings with our customers to support the development of business jets. They talk to us during NBAA-BACE, or during EBACE, and have some good declarations about how it is really cost effective to get a [business aircraft] to travel and to be able to continue to work in flight.” Eric Trappier, CEO, Dassault Aviation.

There was also a mention about harmonising international regulations and most of the executives were positive for the same. Daher, CEO, Didier Kayat stated, “During this crisis, we’ve had excellent relationships with both EASA (European Aviation Safety Agency) and the FAA (Federal Aviation Administration). They’ve been very helpful, supportive and very efficient despite all the limitations.”

However, they did note that different quarantine restrictions



in different places do become a challenge and they hope those can be streamlined. Markus Bucher, CEO, Pilatus Business Aircraft also mentioned about the supply chain disruption and the need to rethink the strategy of sources. James Detwiler, President, Boeing Business Jets added that the industry is going to experience a supply chain tightening as material costs have risen, hitting the bottom lines. But they are hopeful that as the strategy for resources are re-thought and remote collaborative processes continue to reduce some costs and time spent in the pursuit of certification, things might strike a good balance.

“Every airplane we have built in the last 20 years is more efficient in a number of ways. Many of the systems that we built, like synthetic vision – and things of that nature that help the airplane be not just safer, but more efficient – are huge contributors to that sustainability effort,” said Burns while talking about sustainability.



(ABOVE) MARK BURNS, PRESIDENT OF GULFSTREAM AEROSPACE;
(LEFT) RON DRAPER, PRESIDENT AND CEO OF
TEXTRON AVIATION.

More efficiency in fuels, in engine, in aerodynamics ability, synthetic vision, elimination of waste, etc. is needed to be kept in mind while building airplanes further.

The leaders pointed that more efforts are needed as a community going further to ensure a sustainable synergy. Kayat also noted that with greener aircraft, there is a huge opportunity to reinvent and be more responsible which must be harnessed. Over the past year even though pandemic was the major concern, sustainability was not sidelined by the industry and continued steps in the form of discussions and initiatives for sustainable fuels, greener engines, monitoring the carbon emissions have seen the light of the day.

OPTIMISM ONBOARD

Despite the challenges that the industry encountered, the panel was largely optimistic of the way forward and sure of business aviation’s

resilient capabilities. “The pandemic was challenging last year, but I think it has created an amazing opportunity for our industry, looking forward,” said Martel. Draper also stressed his optimism that the industry is going to see increased demand and favorable days ahead.

Other leaders also joined in to highlight that even with the ongoing challenges the outlook is strong. With more digitisation driving in, from Artificial Intelligence to Augmented Reality, contactless to cyber-security, the business aviation leaders are ready to incorporate and improvise the industry with taking initiatives in line with the situational demands.

The session thus showcased a holistic perspective of what the business aviation industry encountered, what it expects and how it sees the situation shaping up in the future directly from some of the most prominent voices of the industry.

EBAA and NBAA pointed to some more standout indicators of EBACE Connect’s success:

- More than 1,600 attendees participated in the programme, which featured keynote discussions with aviation leaders and visionaries.
- Well-known pilot and philanthropist Erik Lindbergh opened the programme by sharing personal insights on the next great era in aviation.
- The EBACE Connect panel sessions likewise focused on business aviation’s future, covering advanced air mobility, safety regulation for new technologies, growing beyond COVID, market trends and sustainability.
- The full lineup of sponsored “Thought Leadership” sessions featured business aviation entrepreneurs and leaders discussing topics such as the evolving workplace, data-management best practices and cloud-based tools for flight operations. [BAI](#)

PHOTOGRAPHS: Gulfstream, Textron Aviation

EXCLUSIVE

TRAY CROW
DIRECTOR OF
INTERIOR DESIGN



PHOTOGRAPHS: Gulfstream

Gulfstream Reveals its Bespoke Approach in Aviation-Design to SP's

With a history of inspiring innovation, preeminent suppliers amalgamated with contemporary customisation, Gulfstream not only balances luxury, style and convenience for its customers, but it also delivers the unmatched aviation design. **Tray Crow, Director of Interior Design** reveals to SP's their unique approach to designing aircraft interiors.

BizAVIndia (BAI): What will be the definition of aviation design according to you, at Gulfstream Aerospace?
Tray Crow (Crow): Every Gulfstream interior is bespoke, from the floor plan to the finishes. Our client-facing team – comprised of a

completions delivery executive, interior designer and completions delivery associate – works closely with each customer to understand their requirements. Once we've customised the floor plan, we launch the interior design process with fabric, leather, veneer and

THE EXCEPTIONAL ARTISTRY OF THE INTERIORS PAVES WAY FOR ELEGANT AMBIENCE OF THE FINEST HOMES IN FLIGHT





(LEFT) GULFSTREAM'S CLIENT-FACING TEAM INCLUDES COMPLETIONS DELIVERY EXECUTIVE, INTERIOR DESIGNER AND COMPLETIONS DELIVERY ASSOCIATE; (RIGHT) THE TEAM WORKS CLOSELY WITH EACH CUSTOMER TO UNDERSTAND THEIR REQUIREMENTS, ENSURING A TAILOR-MADE EXPERIENCE AND PRODUCT.

carpet samples to simplify what can be an overwhelming number of decisions. From there, the customisation process begins. We maintain exclusive relationships with our suppliers to customise materials, such as carpets and leathers, to suit the interior design scheme and palette we are creating.



“WITH A GULFSTREAM JET, YOU CAN HAVE THAT RARE COMBINATION OF SPEED, PAINSTAKING CRAFTSMANSHIP, BESPOKE DESIGN AND ARTISTRY.”



“AT GULFSTREAM, FLEXIBILITY IS THE CORE OF OUR INTERIOR DESIGN AND OUTFITTING PROCESS.”

BAI: What are the foundations of your interior designs?
Crow: At Gulfstream, flexibility is the core of our interior design and outfitting process. If we can be nimble with design, we can better accommodate special requests. One way we maintain flexibility is by completing all aircraft interiors in-house, allowing designers, engineers, the manufacturing team and others the ability to collaborate easily and ensure the final product meets the high Gulfstream standard.



(LEFT) FROM THE FLOOR PLAN TO THE FINAL PRODUCT, EVERYTHING IS CUSTOMISED IN CLOSE DISCUSSION WITH THE CLIENT; (RIGHT) EVERY ASPECT OF THE AIRCRAFT INTERIORS IS DESIGNED BY COLLABORATING CUSTOMER'S VISION AND THE TEAM'S EFFICIENCY TO MEET GULFSTREAM'S HIGH STANDARD.



“GULFSTREAM’S CLIENTS CAN CHOOSE FROM A DEDICATED SUPPLY OF NATURAL, EXOTIC WOODS FOR THE BULKHEADS, CABINETRY AND ACCENTS.”

BAI: What leads to the innovations you try to introduce time to time?

Crow: When a client requests a design with elements not yet seen in the industry, Gulfstream’s interior design and completion teams work with our engineering teams to determine feasibility and execution and then make recommendations to our customers based

on those project parameters.

BAI: How do you keep the balance between luxury & style versus the key necessities of a bizjet keeping the interests of the potential owners and the users of the jets?

Crow: Gulfstream recognises that discerning business-jet owners



“GULFSTREAM HAS A LONG HISTORY OF WORKING WITH PREMINENT SUPPLIERS TO ADAPT THEIR MATERIALS FOR THE REGULATIONS THAT EXIST AT ALTITUDE.”



(ABOVE) GULFSTREAM'S SALES AND DESIGN CENTER OPULENTLY SHOWCASES THE MATERIALS ARRANGED TO ADDRESS EVERY DESIGN SCHEME AND PALETTE BEING CREATED; (LEFT) THE INTERIOR DESIGN PROCESS IS LAUNCHED WITH VARIOUS FABRIC, LEATHER, VENEER AND CARPET SAMPLES TO AID CUSTOMERS IN THEIR DECISION.



expect their aircraft to wed time and excellence. With a Gulfstream, you can have that rare combination of speed, painstaking craftsmanship, bespoke design and artistry.

The materials available exclusively to Gulfstream customers look like what you would find in the finest homes, but they have been made expressly for flight. Gulfstream has a long history of working with preeminent suppliers to adapt their materials for the regulations that exist at altitude. For example, the hand-tufted, made-to-order carpeting, frequently a blend of wools and silks, is aviation-grade, but no less refined.

Gulfstream clients can choose from a dedicated supply of natural, exotic woods for the bulkheads, cabinetry and accents. To ensure the availability and consistency of the wood, Gulfstream maintains a live log program, in which roughly 100 logs sourced from around the world are held in reserve exclusively for Gulfstream clients. Whether you want Smoky Eucalyptus or Mocca Oak, you can be guaranteed that what you choose will be of the best quality.

BAI: Would you like to share some of the most inspiring sources which do inspire you enough to enable you to come up with certain concrete designs for Gulfstream jets?

Crow: Creating bespoke interior designs that surprise and delight Gulfstream customers is what inspires the interior design team. **BAI**

BizAv Activity Surging in the US, Closing the Gap on 2019

BY AYUSHEE CHAUDHARY

Enhanced vaccination drives, easing of restrictions, Memorial Day weekend regain domestic business aviation trends

CHARTER DEMAND IN DOMESTIC MARKETS, ESPECIALLY THE US, MAY EXCEED PRE-PANDEMIC LEVELS THIS YEAR



PHOTOGRAPH: JET MAINTENANCE SOLUTIONS

AS WE BEGIN TO adapt to the new normal and with the gradual acceleration in vaccines, the aviation industry is optimistic to soon see light at the end of the tunnel. In a recent research, Moody's Investors Service published that it has revised its outlook for the global airlines industry to positive from negative. "The positive outlook reflects the rating agency's view that industry fundamentals will materially improve over the next 12-18 months, notwithstanding the current record high daily infection rate in India; travel restrictions in countries with large amounts of traffic to and from India; and ongoing lockdowns in other countries," Moody's stated.

The business aviation industry specifically seems more positive with the United States (US) leading the chart. Data research company, WingX Advance released its data last month displaying that traffic levels in 2021 now need to be interpreted versus 2019, gauging

return to normality rather than rebound from locked-down 2020. "The evidence so far suggests that charter demand in domestic markets, especially the US, may exceed pre-pandemic levels this year. Fractional operators are also starting to do better than ever before in the US," WingX stated. The US market has made notable gains, with business aviation activity this year up by 37 per cent compared to the first four and a half months of 2020.

Compared to the January to May period in 2019, 2021 has seen more than 15 per cent increase in charter flights between the US and Mexico, Bahamas and Turks and Caicos, and 77 per cent increase in charters to Antigua and Barbados. "All told, the business aviation charter market looks to be well teed up for this summer," stated the data company. With almost 50 per cent more sectors this year than last, and 4 per cent more charters flown than in the same period of 2019 in the United States, the charter market appears buoyant right now.

BUSINESS AVIATION ACTIVITY IN NORTH AMERICA (2021 VS 2020 VS 2019)

Departure Country	Flights 2021 YTD	2021 vs 2020: % growth (Flights)	2021 vs 2019: % growth (Flights)
United States	998,505	31.8%	-8.6%
Canada	81,506	7.6%	-14.4%
Mexico	29,064	23.4%	-39.2%
Bahamas	12,724	72.6%	-6.9%
Puerto Rico	3,525	21.7%	-4.5%
Costa Rica	2,553	11.5%	6.7%
Dominican Republic	2,437	51.1%	7.5%
Turks and Caicos Islands	2,052	84.9%	22.9%
Saint Barthalemy	1,977	-9.6%	-32.6%
Sint Maarten	1,923	-0.7%	-34.4%
US Virgin Islands	1,351	47.7%	20.0%
Antigua and Barbuda	947	48.0%	6.6%
Jamaica	632	14.1%	-12.5%
Panama	632	5.9%	16.2%
Guatemala	525	56.3%	14.4%
Anguilla	507	2.8%	-23.2%

Source: WingX Advance

The paced up vaccination drive in the US could well be a major contributor to this rise. According to the latest statistics shared by Our World in data, over 45 per cent of the United States’ population has been vaccinated. Moody’s too noted the strong recovery in US domestic travel demand that began in March 2021 highlighting the benefits of the combination of vaccinations and a large geographic footprint for the return of domestic travel demand.

“Leisure traffic will lead the charge to the boarding gates, while corporate trips and international long-haul will follow, initially at a slower pace. The restoration of the ability to travel will relieve the tremendous pent up demand to fly to visit friends and relatives and for vacations. With offices in many countries opening by fall 2021, this will facilitate the beginning of the corporate travel recovery,” said Jonathan Root, a Moody’s Senior Vice President.

WingX also noted at the start of this month that the tide is turning as vaccination programmes start to release restrictions on all aviation activity, with an emphasis on leisure and domestic trips. This was more particularly demonstrated during Memorial Day in the United States.

Memorial Day weekend saw a substantial increase in business aviation flight activity, with 32,000 flights in the Friday to Monday period, compared to just 17,000 in 2020, with this year’s holiday racking up 4,000 more departures than Memorial weekend back in 2019. Scheduled airline traffic, by comparison, was up 25 per cent on the 2020 holiday but still 28 per cent down on the holiday period in 2019.

US REGIONS ON A HIGH

Particularly in North America, a slightly stronger recovery was noticed in Scheduled Airline activity towards the end of May, as flights were down by only 3.5 per cent in comparison to May 2019. The US too is seeing the bulk of this activity, with 1.2 million jet and prop sectors flown this year, up 40 per cent on last year, down 7 per cent on comparable 2019, stated WingX.

Further pointing out specific regions, WingX pointed out Canada being well back on the recovery curve, up 13 per cent compared to 2020, however compared to 2019 trends it is still trailing 15 per cent. In addition to that Mexico is also a long way back on pre-pandemic activity through May and some Caribbean destinations have managed to break records this year, with arrivals into the Dominican Republic, Turks and Caicos and US Virgin Islands well up versus 2019.

During the Memorial Day weekend, for business aviation travellers, the most populate destinations were Nantucket, Martha’s Vineyard, Las Vegas, Saint Simons, Albuquerque, Miami-OpaLocka, Westhampton Beach. This Memorial Day, there were 52 flights from White Plains into Nantucket Memorial, with the same pair seeing only 9 flights last year, and 54 arrivals back in 2019.

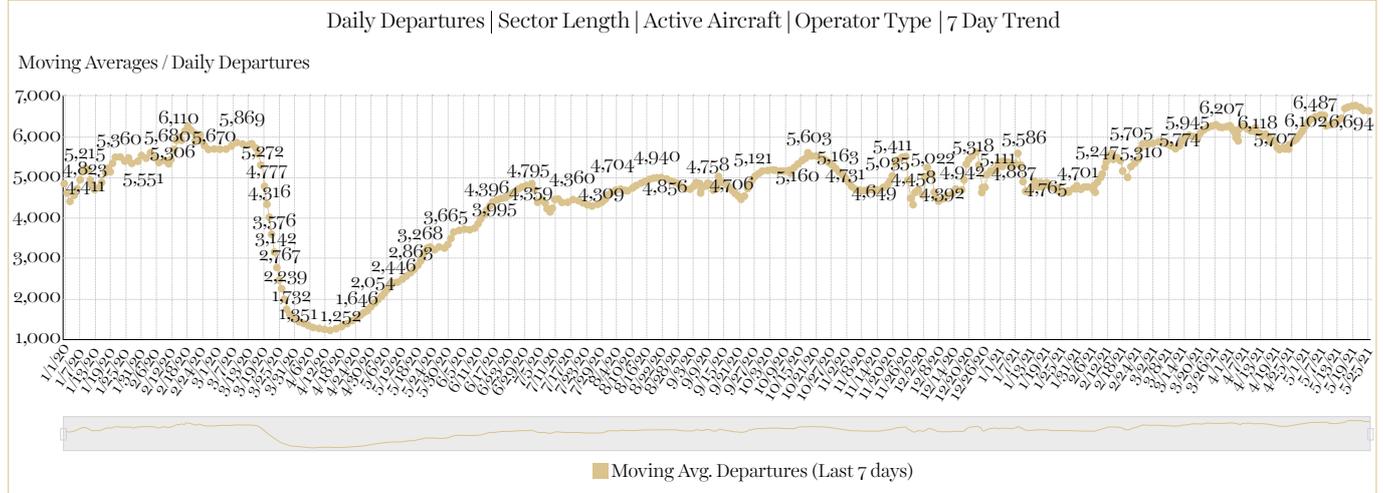
The busiest state in North America has come out to be Florida. Outlining an impressive 22 per cent gain on the same period in 2019, Florida dominated with 1,77,000 business aviation departures this year itself, up 62 per cent on 2020. After the Memorial Day weekend, at the regional level, the US is continuing to see a very strong recovery in the South West, with Florida still the busiest global hub, seeing almost fifty thousand more business aviation departures in the month of May than next busiest State, Texas. Moreover, business jet and prop activity out of airports in Florida is running 34 per cent ahead of May 2020, and 18 per cent ahead of May 2019.

Apart from Florida, both Colorado and Arizona saw more business aviation arrivals in May 2021 compared to May 2019. New York is making a rapid recovery, with 56 per cent increase in flights this year over last and only 1 per cent deficit versus 2019. Other States with more traffic this year than in 2019 include South Carolina, and, exceptional among other Canadian territories, British Colombia.

SIGNIFICANT SEGMENTS

The light jet segment in the US has seen immense recovery with sec-

US BUSINESS JET TRAFFIC 7-DAY ACTIVITY FROM JANUARY 2020 TO MAY 2021



Source: WingX Advance

tors up 52 per cent on last year, and up 3 per cent on comparable 2019. Light jet movements are up, versus 2019 too, in seven of the top ten US States. In the charter market in the US, Light Jets, including the older entry-level Citation jets, are flying 20 per cent more charters than in 2019, while ultra-long range Jets are flying more charters than in 2019, up by 8 per cent this year, WingX noted. In Florida, South Carolina, Arizona, branded Charter operations in Light Jets are 21 per cent ahead of 2019 trends, and almost 50 per cent ahead of pre-pandemic trends.

Even the Super Midsize jets are showing similar strong recovery. Branded Charter sectors on these aircraft are up 50 per cent on 2020, and up 14 per cent on 2019. Fractional operations on Super Mid jets are up 61 per cent versus last year and up 21 per cent compared to 2019.

After the Memorial Day too, light and super-mid activity continues to be dominant, busier than ever, whilst heavy jet movements languish 14 per cent below 2019 levels.

GLOBAL GAUGE

With 3,30,000 sectors operated so far in May 2021, business aviation traffic has more than 20 per cent of all fixed wing aviation movements last month, closing the gap on May 2019 to just 2 per cent, maintaining more than double the traffic compared to May 2020. The deficit so far this year compared to the January through May period 2019 is now 8.7 per cent, with business jet and turboprop operations up more than a third compared to last year to date. Global cargo traffic continues to outpace both 2020 and 2019 activity, whilst scheduled airline activity is only edging back, up by three times compared to May last year, but still down 10 per cent compared to 2020 through May, and slightly closing the gap on 2019, 44 per cent lower on a YOY basis.

Through the first three weeks of May 2021, global fixed wing activity amounted to just over 1 million sectors flown, with 21 per cent of

these operated by business aviation operators, almost double their pre-pandemic share. Business jet and prop flights in the beginning of last month were up by 123 per cent compared to May 2020, 5.7 per cent fewer sectors than in May 2019. Cargo traffic is up 9 per cent this month, down 4 per cent versus May 2019. Year-to-date, business aviation traffic is up by 34 per cent this year compared to last, in stark contrast to the 13 per cent deficit in scheduled traffic this year versus last. Compared to the January through May period 2019, business aviation activity is down by 8.7 per cent.

Very Light and Super Midsize Jets, these segments seeing more activity so far this year than in 2019, respectively 3 per cent and 1 per cent growth in sectors. This month, the combined Light Jet segments, with 40,000 sectors, is also busier than in May 2019. Large cabin aircraft are still making up historical deficits, sectors down by 10 per cent this month compared to May 2019. The recovery is much stronger for branded charter operators; Light Jet charter sectors are up 23 per cent on May 2019, and Heavy Jets are only 2 per cent below 2019 levels. There is also a lot of regional variation: arrivals of ultra-long-range jets into the Caribbean are up 8 per cent this year versus 2019.

Business jet travel in Asia, Africa and South America is also now exceeding 2019 as well as 2020 levels. Stand-out growth is

evident in Brazil, Australia, China, the UAE, India, Nigeria. Saudi Arabia, Morocco and Japan are some of the few countries still behind 2019 trends. Much of the recovery is coming in domestic not international traffic, with UAE-India the top cross-border flown outside the US and Europe. Shorter sector activity is reflected in Ultra Long Range jet usage, still down 10 per cent vs pre-pandemic activity.

As conditions in other markets improve and barriers to travel come down, Moody's expects the current experience in the US market to be repeated globally, over different time frames. **BAI**



OUTLINING AN IMPRESSIVE 22 PER CENT GAIN ON THE SAME PERIOD IN 2019, FLORIDA DOMINATED WITH 1,77,000 BUSINESS AVIATION DEPARTURES THIS YEAR ITSELF, UP 62 PER CENT ON 2020



Tardy Pace of Growth of Civil Aviation MRO in India

BY AIR VICE MARSHAL S.S. CHAUHAN (RETD)
PRESIDENT, BUSINESS AIRCRAFT
OPERATORS' ASSOCIATION (BAOA)

A proactive and conciliatory approach between the industry and the policy makers is required for the growth of this essential sector

SINCE 1947, INDIA HAS made spectacular achievements in a number of technology-based fields. Without much effort, one could at random list Space Technology, Atomic Energy, Armed Forces, Software, Automobiles, Education, Health Care, even, to a large extent, Dairy & Farming, etc... as some

of the notable areas! This has been so due to a conscious political or bureaucratic priority having been given to some selected sectors by the successive Governments in power, while relegating the remaining sectors to the background either as of secondary national priority or by default.

GENERAL AVIATION MRO AT MUMBAI



PHOTOGRAPHS: Air Works

In the civil aviation sector, the field of aircraft maintenance has been such a secondary (more aptly, shall we say, neglected!) field. In the very recent past, that is more than 70 years after independence, there has been some awakening & at least a budgeted clarion call has been given by the Government in power with a view to accelerate the process of growth of Aviation MRO (Maintenance, Repair & Overhaul) in India!

On the other hand, since the early part of these 70 years, smaller countries in our contiguous regions such as, illustratively, Israel, Singapore, UAE, Malaysia & some others - each with its geographical size not exceeding JUST ONE of the 28 States, or of the 8 UTs, of India - have set up & have been operating remarkable MRO facilities for serving not only their own national needs but also of other countries as well. The state of Israel deserves a special mention here, as both Israel & India gained independence in the same year viz 1947, but the difference in Civil Aviation MRO capabilities of these two nations is really vast, Israel being far ahead of, & India being far behind, others!

Save in a few exceptional cases, the MRO issues in the long-term, as applicable to Civil Aviation Aircraft in India, have never been properly understood or appreciated by a majority of the powers that be, whether these be the aircraft owners or the operators, or the bureaucrats & the policy makers. The stress has been mainly on the 'operational part' of aircraft operations, thus, perhaps inadvertently, overlooking the fact that without making equally adequate & definite arrangements for the MRO aspects, the continued availability of aircraft for operations, & in turn profitability, would be seriously impacted over a period of time. The approach in the countries that have set up good MRO facilities, even when not being the OEMs (Original Equipment Manufacturers) of such aircraft, has been quite different. Developing parallel MRO facilities, as an integrated & wholesome part of aviation services, has been their forte. Today the widely dispersed aviation entities in a big country like India depend not only on the 'Aircraft-OEM' countries but also on these smaller (mostly 'Non-OEM') countries to bale themselves out from difficult MRO situations. The cost of such external dependence on aircraft MRO requirements, mandatory by nature, has also been prohibitive, however, there has been no choice with the aircraft owners except to just comply & pay up, while simultaneously rueing & regretting continued non-availability of most of the required MRO facilities within India.

What has been the role of the private sector in setting up, or in not setting up, the requisite MRO facilities?

Once again, by & large, either the potential investor could not properly visualise the merits of this golden business in a long term perspective, or did not have the courage to invest against uncertain profits in the near term. As a business model, it is well-known that the gestation period of aviation MRO projects is at least two to three years more than most other business models, hence the potential investor has been shy of going into such ventures even though the subsequent returns may have had the promise of being much

more rewarding! This is where, one way or the other & as a necessary incentive measure, the Government, or its designated agencies, ought to have stepped in decades ago to actively promote investment into this neglected sector.

Why is a direct Government intervention in aviation MRO sector considered unavoidable? For an answer, one has to understand what has happened in the past, leaving Indian aircraft operators at the mercy of both the OEMs of aircraft (includes engines, components, fittings & furnishings) & of the 'other-than-aircraft-OEM' MRO facilities as have been successfully set up in some other countries.

Keeping flight safety uppermost in mind, the aircraft 'Operations' & the 'MRO' rules have always been the most well-defined articles in the OEM-published manuals, required to be strictly carried out in their implementation by the aircraft operators, further under constant regulation & watch of the country's aviation regulator. The necessary rules of the game for their continued usage, acceptable operational life, timely replacements as well as the MRO

requirements of the aircraft systems/components/parts (be it the engine, the avionics hardware & software, a pump, a fan belt, an electrical fuse, or even a split pin!) are precisely defined in these manuals written by the original equipment manufacturers. The contents of these manuals, pertaining to the hundreds of sub-assemblies, components & parts, that go into the making of an aeroplane, become the law, requiring the OEM's express consent for any proposed deviation whatsoever. For many reasons, including the constant profit motive as the prime reason, any proposed remedy or deviation, even if otherwise technically sound in nature & content, would not be agreeable as it would also involve a tedious process of clearance from the OEM country's aviation regulator as well. Further, such OEMs will not ordinarily agree to provide equipment overhaul manuals to outsiders, as this would impact their constant & guaranteed flow of work, hence continued

profits, from all such nations who in the first place bought the aircraft type in question, whether by the governments or by the private individuals or establishments. The buyer country's aviation regulator also cannot help, even if the end-user offers a reasonable request or a sound technical suggestion, as the regulator would not have the necessary authority or the expertise to over-ride the design intent of the manufacturer as well as of the original (seller) country's aviation regulator who gave 'Release to Service' approval to the aircraft design, manufacture & operational clearance. This leads to a constant, long-term, economically exploitative situation of the buyer by the seller: an international monopolistic situation that has been & will continue to be difficult to overcome by our aircraft buyers in the civil aviation sector!

What may be a likely solution to this impasse? Well, nothing other than a Government-level intervention by the buying country. But how? Well, as a practical possibility, it is suggested that this is how:



**WITHOUT MAKING
EQUALLY ADEQUATE &
DEFINITE ARRANGEMENTS
FOR THE MRO ASPECTS,
THE CONTINUED
AVAILABILITY OF
AIRCRAFT FOR
OPERATIONS, & IN TURN
PROFITABILITY, WOULD
BE SERIOUSLY IMPACTED
OVER A PERIOD OF TIME**



THE COST OF EXTERNAL DEPENDENCE ON AIRCRAFT MRO REQUIREMENTS HAS BEEN PROHIBITIVE

Our current inventory of civil aviation aircraft are purchased from the aircraft manufacturing houses mostly located in USA, Canada, Europe, UK & South America). These aircraft orders fall into the following three categories:

- Orders in bulk (even upto 100 aircraft at a time) by the scheduled airlines.
- Orders in small numbers, say one, two or three aircraft at a time, by private investors or the state governments, for deployment in the corporate or business aircraft role, or for private/personal flying.
- Orders in small numbers in batches for flying training schools, in both the public & the private sectors.

In a monopolistic situation, what matters most is the ‘leverage’ that a buyer can exercise on the seller at the time of purchase of the commodity in question. As such, the aircraft buyers in categories ‘2 & 3’ above may not have sufficient leverage with the sellers due to ‘low’ & ‘non-simultaneous’ numbers on order. One therefore needs to lock on to category ‘1’ buyers i.e. the scheduled airlines, known to place very high value orders involving large number of aircraft, engines & associated spare parts at a time.

It needs to be remembered that permission to import all types of aircraft is given by the Government. Here one can take a cue from the ‘Defense Procurement Procedures’, wherein the Government has built an “Offset Clause”, under which the seller OEM is obliged to plough back, say , 30 per cent of the value of the order into the buyer country projects.

In this respect, neither the Government of India, nor, by & large, the scheduled airlines have put their foot down in the past to ensure

that it is made a mandatory obligation on the part of aircraft manufacturers to set up the supporting MRO facilities in our country as & when bulk orders for aircraft & engines, running into billions of dollars, are placed on the suppliers. While, at times & as an option, the scheduled airlines may have shelved some of their other interests & decided to set up such or much associated MRO facilities, it is upto the Government of India to make it a mandatory pre-condition for the aircraft OEMs to set up a comprehensive range of practicable MRO facilities before granting permission to the scheduled airlines to import such bulk quantities of aircraft, engines & components/accessories into the country. Here, it is also strongly suggested that an expert technical committee or a qualified representative of the country's aviation regulator - the DGCA - should be essentially involved in defining the nature & extent of such MRO facilities to be set up in the country against an ‘offset clause’, so as to protect & promote the overall national MRO interests. The regulator, at its discretion, may also consider involving or consulting concerned agencies such as, for example, the ‘MRO Association of India’. Such a step would surely put the foundation of the aviation MRO industry in India on a firm footing. This will also subsequently have a natural multiplier effect over a period of time to serve even the MRO requirements of the other ‘poor country cousins’ of the scheduled airlines, viz the minority ‘Business Aviation’ & the ‘Private Category’ aircraft owners. If such a step has not been considered earlier, well, it is never too late to take the appropriate steps even now & thereafter it is expected that remarkable results would be seen over the next few years in the development & consolidation of the ‘Civil Aviation MRO Industry’ in India. BAI

Vertical Business Jet: A Game Changer

BY GROUP CAPTAIN C.J. WEIR (RETD)

The Vertical Business Jet, once developed, will give the user the benefits of a fixed-wing aircraft with the takeoff and landing capabilities of a helicopter

“You build a kilometre of a road, it leads you nowhere; you build a kilometre of a runway and you are connected to the world” — Anon

THIS OFT-USED ADAGE HAS driven the development of aviation infrastructure over the last few decades. The progress made by a number of companies to make the Vertical Business Jet (VBJ) a viable and reliable product is indeed noteworthy. This concept has the potential of reducing dependence on traditional infrastructure requirements whilst dramatically increasing its deployment possibilities. In fact, it turns the above-quoted adage on its head. As with most innovations in the

domain of aviation, the VBJ can also trace its roots to the needs of the military. A large quantum of funds has been poured into Research and Development to acquire the capability to produce the tilt-rotor Osprey, the Harrier with variable jet nozzles and a number of other features. The challenge here is to integrate various cutting edge technologies to have an economically viable aircraft that can meet with the prevailing safety standards, the sophistication expected and price of Business Jets operating in the six to eight seater, twin-engine category. Once this challenge is met with, the aircraft will find markets globally.

The VBJ, once developed, will give the user the benefits of a

PEGASUS VBJ AIRCRAFT. THERE ARE A NUMBER OF COMPANIES WHERE THE VBJ IS IN VARIOUS STAGES OF DEVELOPMENT.



PHOTOGRAPH: Pegasus Universal Aerospace

fixed-wing aircraft with the takeoff and landing capabilities of a helicopter. This would save on the additional time required in accessing the conventional fixed-wing Business Jet parked at a busy airport. Presently, the helicopter is widely used to connect to destinations where runways are not available.

As wonderful as they may be, helicopters adapted for business use have limitations of range and cabin space. The time spent in the helicopter cabin cannot be utilised for business-related discussions as noise and vibrations restrict meaningful conversations. Compare this to the plush and low noise environment of a Business Jet. A comparison of a typical business trip for a corporate head flying to visit a remote facility five hundred kilometres away would involve a home-to-airport-to-factory route. The first and last legs would be by surface transport or helicopter. A trip in the VBJ would comprise a direct home-to-factory route, where the productive time generated (in most cases) on a 500-kilometre trip would be as much as 50 per cent more!

There are a number of companies, where the VBJ is in various stages of development, claiming that they could have the aircraft operational as early as in 2022. That is an optimistic time-frame as the certification of a platform based on a new concept is going to be time-consuming. First, the prototype would need to be test-flown and then assigned to production. The financial challenge too would need to be addressed as large amounts of funds are required for such a project. This process also throws up the challenge of a few basics that need to be examined and understood in order to negotiate the certification process. The International Civil Aviation Organisation (ICAO) has delegated this process to regulators such as the Federal Aviation Administration (FAA) in the United States and the European Union Aviation Safety Agency (EASA).

In the technological aspect of the VBJ, the single most important issue, is the manner in which the aircraft will achieve roll-and-pitch control, and how the VBJ will transit from high speed horizontal flight to low speed vertical flight. This is a new concept that would demand understanding by the design teams from the point of view of the regulator. Since the dynamics of a fixed-wing aircraft are being combined with those of a rotary-wing platform, the basic premise, as to the category under which the approval is being sought, needs to be addressed. The current process of pilot licensing and dovetailing the requirements specific to this concept, would also need to be understood.

The Commercial Pilot Licence (CPL) and Airline Transport Pilot Licence (ATPL), that are fixed-wing pilot licences, are entirely different licences from the Commercial Helicopter Pilot Licence (CHPL) and ATPL (H), which are the licences for helicopter pilots. Pilot training would be another area which would need to be reviewed and restructured. Eventually, the controls in the cockpit will govern the levels of pilot expertise that is necessitated by the degree of dif-

ficulty to execute a safe and precise vertical landing and takeoff. One of the lessons learnt from the Boeing 737 MAX tragedy was that the over-dependence on technology in areas, where critical pilot skill is required, can be hazardous. All these issues need to be taken into consideration at the design stage itself.

Considering the enormous potential of the concept and the requirements of large capital to fund such a concept, there is a requirement to have a concerted awareness campaign directed at countries with large, inaccessible remote areas. India is probably one such region where the VBJ will find a large market, at the level of the governments in the states as well as among the business conglomerates. The heads of state governments are flying extensively using a combination of Business Jets and helicopters for last leg connectivity. The corporate sector has interests in relatively remote areas where the VBJ could provide a viable alternative. The availability of a VBJ may even open up areas that were not considered viable earlier. The



XTI AIRCRAFT COMPANY IS ACCELERATING DEVELOPMENT OF ITS TRIFAN 600 VERTICAL TAKEOFF AIRPLANE

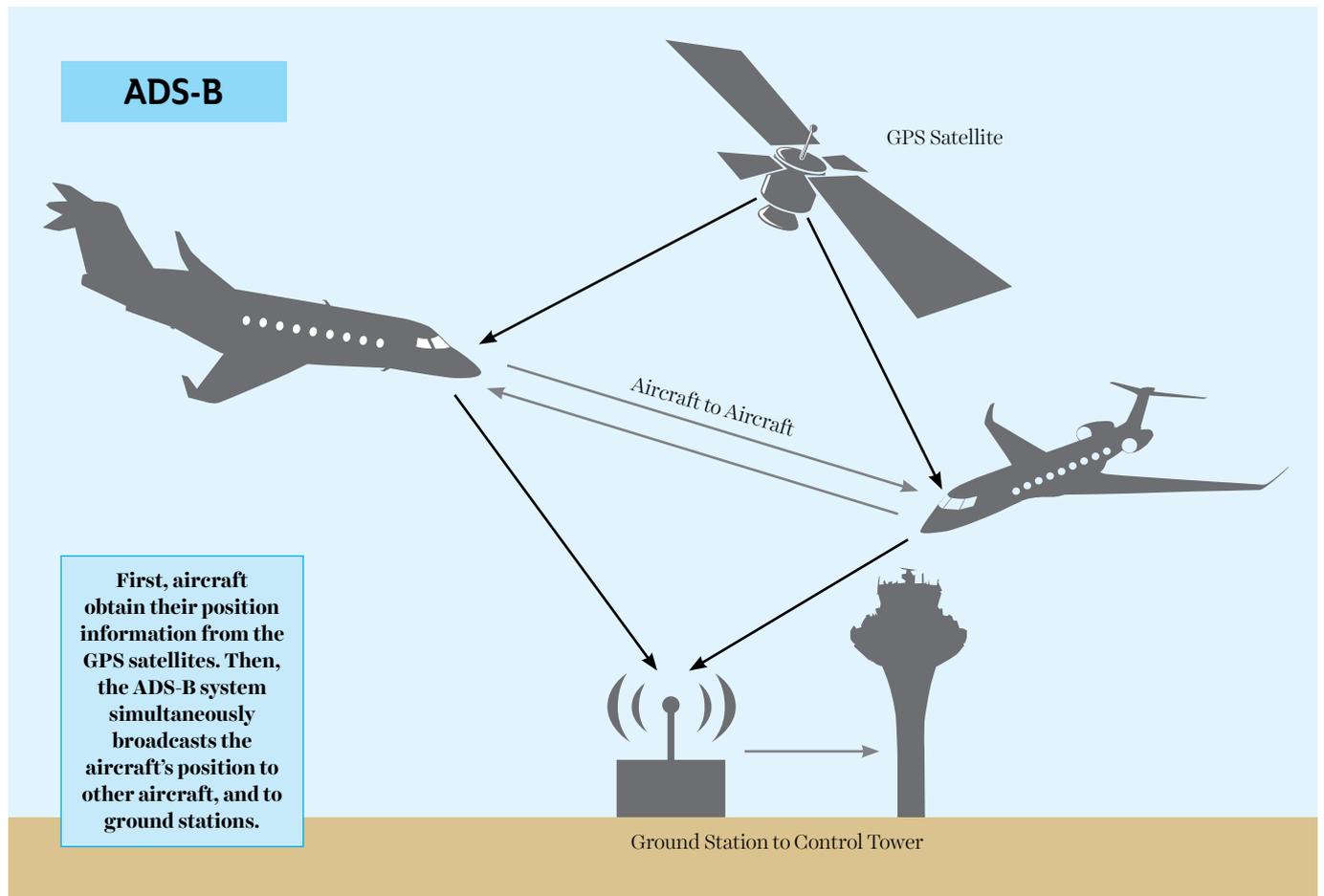
present investment environment in India is also conducive to establish marketing and maintenance hub-centres with even the possibility of licensed production. The major stakeholders spearheading this concept need to see the potential of India not only as a marketing opportunity but also as an investment partner providing critical funding as well as a manufacturing hub at markedly lower costs.

With an amalgamation of several cutting-edge technologies into a superb package, the VBJ will be a game-changer. There are a number of advantages that this aircraft is going to bring with it once it crosses the hurdles of certification. The Asian market has enormous potential, with India possibly playing the lead role in funding, manufacture, maintenance and marketing. The companies that are investing time and effort to make a success of this project must also aim to spread awareness about it with emphasis on safety, comfort and capability. [BAI](#)

Air Space Management Solution for Safer and Efficient Travel

BY SUDHIR S. RAJESHIRKE

ADS-B provides more accurate positioning of the aircraft on real time basis with which ATCs can better manage the flow of the air traffic by reducing aircraft separation



ILLUSTRATIONS: SP Guide Pubns

SEVERAL MAJOR COUNTRIES AROUND the world are implementing a technology called Automatic Dependent Surveillance–Broadcast (ADS-B) that helps to better track the location of an aircraft and enhance global safety within Air Traffic Services (ATS). The reason is that regulators wanted

to implement a tracking and air space management solution which is environmentally friendly, enhances safety as compared to existing radar based systems and directly benefits pilots, controllers, airports and the airlines. The purpose of this article is to provide a simple understanding of this technology and how it benefits the aviation ecosystem.

WHAT IS ADS-B?

ADS-B is a surveillance technology which allows equipped aircraft and ground vehicles to broadcast their identification, position, altitude and velocity to other aircraft and the Air Traffic Controllers (ATCs) on 'real-time' basis. The technology may eventually replace radar as the primary surveillance method for Air Traffic Control (ATC) monitoring and separation of aircraft worldwide.

ADS-B consists of two different services – “ADS-B OUT” and ADS-B-IN”.

With ADS-B OUT, the aircraft broadcasts its identification, position, altitude and velocity on real time basis to other aircraft and the ATCs.

With ADS-B IN, the aircraft is able to receive the above information from other aircraft including weather data and pilot reports. This provides more situational awareness for pilots and air traffic controllers.

Further, to receive ADS-B IN services from the ground network, aircraft must broadcast valid ADS-B OUT messages. Hence ADS-B OUT is or will become mandatory, whereas ADS-B IN is not mandatory.

From an overall technical perspective ADS-B has three main components:

Ground infrastructure: The ADS-B data transmitted by the aircraft or airport vehicles are received by the ADS-B ground stations. The output of the ADS-B ground stations is processed by surveillance data processing and distribution systems along with radar sensory systems to create a possibly seamless, accurate and reliable Air Situation or Air Traffic Picture.

Airborne components: The “ADS-B OUT” capability on board is enabled by transponders interfaced with the relevant avionics systems (such as GNSS, pressure altimeters etc.). Many aircraft have ADS-B 1090 MHz Mode S Extended Squitter technology that is used worldwide to ensure global interoperability.

The “ADS-B IN” capability requires a receiver, a processing system and a display system for providing traffic and hazardous weather system.

Operating procedures: Operating procedures include processes and ADS-B specific phraseology to be followed by all stakeholders (pilots, ATCs, airports) required for safe and structured communication over ADS-B system. The operational use of ADS-B requires certification and operational approval by the regulatory authorities.

WHAT ARE THE BENEFITS OF ADS-B?

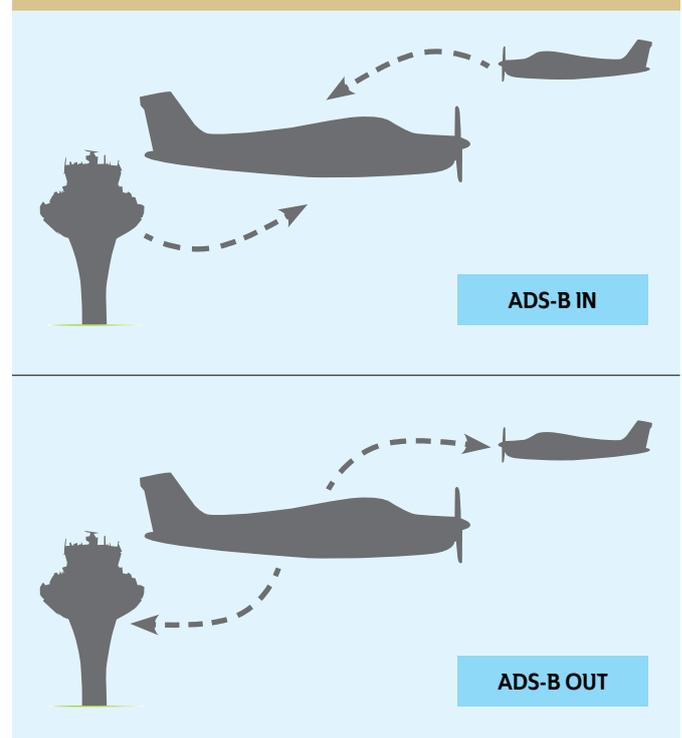
Of the several ones, ADS-B provides three broad benefits:

Safety: ADS-B provides high level of situational awareness as pilots have the ability to assess real time position of other aircraft in their vicinity (equipped with ADS-B OUT) as well have access to weather information.

Airspace capacity and efficiency: As ADS-B provides more accurate positioning of the aircraft on real time basis, ATCs can better manage the flow of the air traffic by reducing aircraft separation, leading to better management of airspace capacity.

Reduced environmental impact: ADS-B reduced the requirement for aircraft separation. In addition, it increases the ability of the pilots to self-separate and enhances their visual approaches. This allows ATCs to guide aircraft into and out of crowded airspace with smaller separation standards than it was previously possible to do safely. Airplanes are able to perform Continuous Descent Approaches (CDAs) which reduces fuel consumption and noise com-

TYPES OF ADS-B



pared to other conventional descents. As this reduces aircraft waiting time for clearances, there is a tangible impact on fuel savings and noise pollution.

HOW IS INDIA PREPARED FOR ADS-B IMPLEMENTATION?

Per 2019 ICAO Working Paper on India's plan and progress on implementation of ADS-B surveillance and data sharing activities, India has installed 31 ADS-B sensors out of which 29 are installed in the mainland and one each in Port Blair Island and Campbell Bay Island in Bay of Bengal. ADS-B ground receivers have been installed for enroute surveillance services and for approach control surveillance services at major and minor city airports.

WHAT ARE THE IMPLEMENTATION TIMELINES?

Countries such as USA (within defined airspace) and India have mandated ADS-B OUT implementation from January 1, 2020 onwards, but have been accommodating change in implementation schedule.

India: The ADS-B mandate across Indian airspace was due to take effect on 1st January 2019. However, it is expected that the implementation will happen in last quarter of 2022. As of now, aircraft flying on performance based navigation routes almost everywhere in Indian continental airspace at or above an altitude of 29,000 feet must carry serviceable 1090 MHz ES ADS-B transmitting equipment.

ADS-B is the technology that will help aviation become more safe, efficient and sustainable. Hence a global concerted effort on implementation of this technology could go a long way in creating a better future for aviation. [BAI](#)



SP GUIDE PUBLICATIONS



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ARE PROUD TO STATE

FIRST TIME,
SP GUIDE PUBLICATIONS PARTICIPATED IN NOMINATION PROCESS FOR
AEROSPACE MEDIA AWARDS **IN 2019**
AND, SP GUIDE PUBLICATIONS EMERGED AS A **WINNING MEDIA** WITH
SEVEN ARTICLES NOMINATED AS FINALISTS UNDER **4 CATEGORIES**
WHEREAS, AVIATION WEEK & SPACE TECHNOLOGY GROUP
HAD THEIR FIVE ARTICLES NOMINATED AS FINALISTS
WHEREAS, FLIGHTGLOBAL GROUP
HAD THEIR FIVE ARTICLES NOMINATED AS FINALISTS
WHEREAS, IHS JANE'S GROUP
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INNOVATING FOR SUSTAINABILITY

While innovating to deliver peak efficiency and performance today, we never lose sight of tomorrow. In the air, our new, clean-sheet aircraft achieve industry-leading fuel economy and reduced emissions. On the ground, green facilities, sustainable manufacturing processes and a carbon offset program help guide the way to a better shared future.



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