ISSN 2230-9225

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British Prime Minister David Cameron and Airbus Group CEO Tom Enders during a visit at the Farnborough International Airshow 2014.

Cover image by: Airbus Group

SKYWARDS: STATIC DISPLAY A350 XWB WINGLET

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LEAD STORY

FARNBOROUGH 2014

The Farnborough International Airshow held in July did phenomenal business with orders and commitments achieving a new record of $201 billion, reflecting buoyancy of the aerospace industry.

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Dynamics of Civil Aviation Business in India

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SUBSCRIPTION/ CIRCULATION
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Owned, published and printed by Jayant Baranwal, printed at Kala Jyothi Process Pvt Ltd and published at A-133, Arjun Nagar (Opposite Defence Colony), New Delhi 110 003, India.

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AS HAS BEEN THE PATTERN, THIS YEAR TOO, THE FARNBOROUGH INTERNATIONAL AIRSHOW WAS PATRONISED BY ALL THE GLOBAL AEROSPACE MAJORS COVERING THE REGIMES OF BOTH CIVIL AND MILITARY AVIATION.

THE HIGH POINT ON the global aviation industry scene in the recent past was the world famous biennial airshow that was held from July 14 to 20 this year at Farnborough, a suburban airfield around 30 km from London. With the first airshow at Farnborough held in 1948, this event of global repute has been staged since then with unfailing regularity every two years. As has been the pattern, this year too, the airshow was patronised by all the global aerospace majors covering the regimes of both civil and military aviation. The Farnborough International Airshow is well known for facilitating business opportunities for the global aerospace industry. As one of the world's largest exhibitions and air displays, the event provides a wealth of dedicated and focused business platforms. This year the airshow registered extraordinary levels of business with orders and commitments achieving a new record of $201 billion, reflecting the revival and overall buoyancy of the global aerospace industry.

While the Farnborough Airshow celebrated 100 years of aviation featuring aircraft from every decade of the last century, there was some disappointment also as the much anticipated air display by the F-35B Lightning II was cancelled on account of safety concerns generated by an episode of fire on an F-35B aircraft in the US prior to the airshow. This issue of *SP's Aviation* carries detailed reports on the Farnborough Airshow by R. Chandrakanth, representative of SP Guide Publications.

In the wake of the Narendra Modi-led NDA Government coming to power in the last week of May this year, there have been a number events that can have a profound impact on the aerospace and defence industry in India. The decision of the new government to enhance the limit of foreign direct investment (FDI) in the Indian defence industry from 26 to 49 per cent is expected to provide a boost to the growth of the indigenous industry. However, Pratyush Kumar, President Boeing India, feels otherwise and says that the new level of FDI may not make a real difference. He recommends that for the upper limit of FDI ought to be enhanced to 51 per cent to enable foreign investors to establish some control over their investments. But another school of thought holds that the Indian aerospace industry in the private sector apart from higher levels of FDI, will need a large measure of support from the government to be able to stand on their own feet and make a meaningful contribution to the national effort in this regime.

Other events of significance post national elections were visit by the Secretary of State John Kerry, the first high ranking functionary from the United States to land in Delhi. John Kerry's interaction in Delhi was followed by a visit by the Defense Secretary Chuck Hagel. The common thread in the visits by both the senior functionaries in the US Government was an overwhelming desire to revitalise the sagging relationship between the two largest democracies in the world. Hopefully, the Defense Secretary's visit will provide the required impetus for the finalisation of contracts pertaining to the Apache attack helicopters as well as for the Chinook heavy-lift helicopters that have been in the pipeline for some time now.

Strangely enough, in the last few months, as many as four airliners have fallen out of the sky in quick succession. Even while the Malaysian Airlines was trying to unravel the mystery behind the disappearance without a trace of their flight MH-370, a Boeing 777, MH-17, another Boeing 777, was lost over Ukraine and is believed to have been shot down over Ukraine. A report in this issue describes the episode as "Aerial Terrorism". While it may take some time and effort to develop foolproof devices to defeat surface-to-air missiles, for the time being it is best to avoid flying over zones of conflict in the interest of air safety.

All these and more apart from the regular features in this issue. Welcome aboard!

JAYANT BARANWAL
PUBLISHER & EDITOR-IN-CHIEF

NEWS:

HAL TO RE-DESIGN INTERMEDIATE JET TRAINER

This was coming and now it is official. Pincered in by a combination of pressures, the state-owned Indian aerospace major Hindustan Aeronautics Limited (HAL) has decided to re-design and weight-optimise its Stage-II jet trainer, the HJT-36 Sitara, officially calling upon global airframers to size up the platform and hammer out a prescribe. After persisting with the line that the aircraft was fine and that it was rapidly piercing through test points towards service status, the new decision to scout assistance is HAL's first admission that there's been trouble all along. Intended as a training bridge between the now in-service Pilatus PC-7 MkII basic trainer and BAE Hawk advanced jet trainer, the IJT was to enter service in June 2012.

VIEWS:

AFTER THE PREMATURE GROUNDING of the HAL-built HPT-32 basic trainer fleet in July 2009 that created a serious crisis, the Indian Air Force (IAF) now finds itself in the throes of another and perhaps more serious. The existing fleet of the HAL-built HJT-16 Kiran aircraft, whose induction had begun in 1968, is dwindling rapidly and the intended replacement, the HJT-36 designed and developed by HAL, does not seem to be anywhere near achieving operational status. The possibility of the IAF being left without a jet trainer for Stage II training of combat pilots is looming large over the horizon.

As early as in 1997, HAL embarked on a project to design the HJT-36. In the year 1999, the Ministry of Defence (MoD) had accorded formal approval and the required funds to the Indian aerospace major for the development of a platform that was dubbed as the Intermediate Jet Trainer (IJT). The first prototype PT-1 undertook its maiden flight on March 7, 2003, just 20 months after commencement of construction, a remarkable achievement indeed! On this occasion, the aircraft was christened by the then Prime Minister Atal Bihari Vajpayee as "Sitara". The second prototype PT-2 flew exactly a year later. However, for some reasons, it appears that the project has gone off the rails thereafter as it missed the first target date of 2007 for entry into service and then even the revised time lines of 2010 and 2012 could not be honoured.

However, a contract stands awarded by the MoD to HAL to build a dozen limited series production aircraft followed by 75 production aircraft. Unfortunately, even seven years after the initially planned date for entry into service, the aircraft is yet to receive initial operational clearance while the date for the final operational clearance has been announced as December 2014 and that for induction of the aircraft into the IAF as 2015. But there are imponderables ahead.

The first stumbling block that HAL encountered was the selection in 2005 of the AL-55I turbofan engine of 16.9 kN thrust rating from NPO Saturn of Russia to replace the originally installed Larzac engine from Snecma Turbomeca of France. As the latter delivered only 14.1 kN of thrust, the aircraft was regarded by the IAF as badly underpowered. The option of the AL-55I definitely appeared more attractive as it provided for licence-production in India by HAL that already had a well developed infrastructure in Koraput, Odisha, where engines for the Su-30MKI are being manufactured.

Acquisition of the new engine proved to be troublesome for the project as the first engine was delivered only in December 2008, two years later than scheduled. Besides, there were three major accidents involving prototypes in February 2007, February 2009 and April 2011 that necessitated grounding of the aircraft for repairs and investigations. All these factors resulted in the project getting delayed inordinately.

All along the HAL had been assuring the IAF that the project was proceeding well and the minor issues would be resolved soon. However, it now transpires that the aircraft is not only overweight but more importantly, is afflicted with serious aerodynamic problems that have implications for air safety. This is not acceptable to the IAF especially as the aircraft would be flown by trainee pilots with low experience. On account of the aerodynamic problems, test pilots themselves have not been able to put the aircraft through stall and spin trials. HAL is now of the view that for the problems to be solved, the airframe would have to be redesigned. As the lone Indian aerospace major finds itself up against a wall, it is seeking collaboration with a reputed original equipment manufacturer (OEM) from abroad to find ways to reduce weight from the present 4,150 kg as also to redesign the airframe to solve the problems of handling at low speeds to enable test pilots verify stall and spin characteristics.

Given the complexities of airframe redesign, it goes without saying that there is no possibility of the Sitara being available to the IAF by 2015. In fact it could well be that the Sitara may not become operational at all. As the IAF has once again been left high and dry, it has adopted the only option that it has i.e. to procure a suitable platform from the global market and soon enough to sustain Stage-II training. To this end, the IAF has already floated a global request for information seeking inputs from OEMs on jet trainers for primary task of Stage-II training of pilots and secondary task of counter-insurgency operations. SP

—By Air Marshal B.K. Pandey (Retd)

PHOTOGRAPH: SP GUIDE PUBNS

NEWS WITH VIEWS

NEWS:

BLACKLISTING WILL JEOPARDISE THE BATTLE-READINESS

The Attorney General has advised the NDA Government that a ban on the Italian conglomerate Finmeccanica and its subsidiary AgustaWestland is enmeshed in the VVIP helicopter scam, would jeopardise the battle-readiness of the armed forces and impinge on national security. Blacklisting Finmeccanica and its several subsidiaries is not advisable as the CBI investigation and subsequent trial in the VVIP helicopter scam could take over a decade to be completed. The government has decided against blacklisting Rolls-Royce currently under the CBI scanner for allegedly paying hefty commissions to Indian agents to secure contracts. The Defence Ministry will clear those projects with Rolls-Royce that are crucial for national security.

PHOTOGRAPH: AGUSTAWESTLAND

VIEWS:

DURING THE RULE OF the UPA Government over the last decade, A.K. Antony can pat himself on the back for being the "longest serving Minister of Defence". But as far as the Indian armed forces and the nation at large are concerned, Antony's tenure as the Minister of Defence will be known more for scams in deals pertaining to procurement of military hardware, blacklisting of several leading aerospace and defence firms from South Africa, Singapore and even Israel with whom the nation had for long enjoyed a robust relationship, even during the cold war era. Antony's somewhat misplaced obsession for honesty, personal integrity, transparency and his penchant for ordering investigations at the slightest hint of misdemeanour in the processing of tenders, slowed down the procurement process that is already subject to intense scrutiny by a multi-layered bureaucracy. Such action by the Minister of Defence invariably resulted in delay in the induction of urgently needed military hardware or even failure of contracts that seriously eroded operational capability.

Antony was also somewhat trigger-happy in ordering cancellation of contracts not only in the last minute but even halfway through its execution. The tender for artillery guns for the Indian Army was cancelled five times leaving the Indian Army even today without a replacement of the obsolete Bofors guns. The most recent case was that of the contract for 12 AW-101 helicopters for VVIP travel. Cancellation of this contract after the delivery of three platforms to the Indian Air Force (IAF) and payment of 45 per cent of the contract value made in advance to the original equipment manufacturer (OEM), has been a source of considerable embarrassment for the IAF that is left with no rotary wing aircraft for VVIP travel. Given its predicament, the IAF has no option but to retrofit for VVIP travel, the newly inducted Mi-17V5 drawn from the operational fleet.

The advice by the Attorney General to the NDA Government not to impose a complete ban on the Italian conglomerate Finmeccanica reflects a good understanding of ground realities. Finmeccanica and its subsidiaries are already involved in several ongoing defence projects in India including the $20-billion tender for 126 medium multi-role combat aircraft (MMRCA) for which the Rafale from Dassault of France has emerged as the preferred platform. Finmeccanica holds a 25 per cent share in MBDA, a joint venture with Airbus and BAE Systems, which is in the race to supply the Meteor air-to-air missile for the MMRCA fleet. Also, Finmeccanica is in the race for Indian military contracts worth over $6 billion, ranging from helicopters and aircraft to missiles and guns. Projects that are currently on hold include the ₹1,800-crore deal for 98 "Black Shark" heavyweight torpedoes for the Scorpene submarines being built in India. These torpedoes are manufactured by Whitehead Alenia Sistemi Subacquel (WASS), a Finmeccanica subsidiary. Finmeccanica also has a stake in the European NH-90 helicopter that is in the race for the multi-role helicopters contract for the Indian Navy that would run into several billion dollars. Imposing a complete ban on the company in question at this stage would undoubtedly be unwise as it would prove counterproductive.

In the case of the proposed blacklisting of Rolls-Royce, the British manufacturer of aircraft engines, once again, the Attorney General has maintained consistency in his assessment of the situation. The Indian Navy and the IAF are all heavily dependent on Rolls-Royce for the maintenance of aero-engines installed on fixed-wing aircraft, helicopters and fast-patrol vessels. For the IAF, Rolls-Royce engines power the Jaguar, Avro, Embraer Legacy jets, C-130J Super Hercules, Hawk advanced jet trainers and Kiran MkII jet trainers. In the Indian Navy, Rolls-Royce engines are fitted on the Sea Harriers.

Defence contracts involve huge outlays and parties disaffected can easily subvert the tendering process through allegations of wrongdoing. In cases of alleged corruption in defence deals, as a matter of policy, the Ministry of Defence must separate offence from the contract and deal with the former rather than cancel the contract itself and jeopardise national security. It is indeed fortunate that the NDA Government has begun to shed the legacy of the past and the interest of national security, has adopted a far more pragmatic approach to dealing with allegations of corruption in defence deals. SP

—By Air Marshal B.K. Pandey (Retd)

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49% FDI IN DEFENCE – A STEP IN THE RIGHT DIRECTION

PHOTOGRAPH: BOEING

It may be in India's interest to cross the two per cent barrier and allow up to 51 per cent stake sooner than later

INCREASE IN THE LIMIT of foreign direct investment (FDI) limit from 26 to 49 per cent for the defence sector is a step in the right direction and welcome. This step broadens the envelope for India's vibrant private industry to tie-up with international original equipment manufacturers (OEMs) for opportunities where controlling stake is not central to the business case, especially in light of 'Buy & Make (Indian)' focus on defence procurement.

Just changing the cap from 26 to 49 per cent does not alter the control in the venture. Therefore, cases where the controlling stake is essential for the business case such as where cost of developing technology is not sufficiently liquidated or where control of intellectual property rights (IPR) is crucial, this change may not be sufficient to unleash a new wave of FDI. As the defence manufacturing industry is complex and requires significant investment in research and development, quality systems and manufacturing technologies, many OEMs may not risk loss of control in a venture by holding less than 51 per cent. Indeed, given the above, one school of thought is if 26 per cent cap has not yielded much investment, 49 per cent won't either.

Also, a non-controlling stake would not necessarily encourage investments that are primarily meant for export-oriented manufacturing where OEMs like to set-up fully owned units to capture productivity and competitive benefits India offers without having to relinquish control on sensitive IPR.

Boeing has so far taken a non-equity route to partnership with the Indian industry. Over the years it has spent well over a hundred million dollars in supplier development, training, tooling and quality systems at Indian suppliers without taking an equity stake. Joint ventures (JVs) bring the complexity of governance, so to the extent possible, Boeing has attempted to maintain a straight supplier relationship while continuing to invest in their development. While Boeing's investment in the Indian supply-chain may not count as FDI as it is not in the form of equity, it has been a significant contributor towards developing world-class capabilities in aerospace manufacturing at companies such as Tata Automation Limited (TAL), Dynamatic Technologies, Rossell Techsys, Hindustan Aeronautics Limited (HAL) and Tata Advanced Materials Limited (TAML).

India's decision to liberalise FDI in defence to 49 per cent is a welcome step. We understand that on a case-to-case basis, the government may allow higher stake if that is in India's interest – for cutting-edge technologies, manufacturing know-how and employment generation. Given the byzantine approval process for exceptions, it may be in India's interest to cross the two per cent barrier and allow up to 51 per cent stake sooner than later. SP

—By Pratyush Kumar, President Boeing India

REBOOTING INDO-US RELATIONS

The Indian armed forces have a high stake in the bilateral relations between India and the US

JUST A FEW MONTHS ago, Narendra Modi was a persona non grata in the US. It was indeed somewhat ironic and perhaps height of arrogance, that the most advanced democracy in the world was not prepared to grant a visa to Narendra Modi, a high profile Chief Minister of a progressive state in the largest democracy in the world. However, things took a different turn suddenly when John Kerry, the US Secretary of State, arrived in Delhi end July for what is being widely perceived as an exercise to roll out the red carpet to welcome Narendra Modi, the Prime Minister of India, to the US in September this year for a meeting with President Barack Obama. This volte face only reinforces the old adage that in politics, there are no permanent friends or enemies, only permanent interests!

THE US SECRETARY OF STATE JOHN KERRY CALLING ON THE PRIME MINISTER NARENDRA MODI IN NEW DELHI

John Kerry is the first high-ranking functionary of the US Government to visit India after the NDA Government came into power. His visit was supposedly related to the fifth India-US Strategic Dialogue that began five years ago to strengthen bilateral relations between the two nations. Unfortunately, the initiatives in this direction that held considerable promise, have petered out and the relationship between India and the US has been on the wane since the historic and much touted Indo-US civil nuclear deal. Potentially a bonanza for US companies, the civil nuclear agreement seems to have run aground on account of the nuclear liability issues. But this is not the only impediment as Indo-US relations are plagued by a number of other problems namely the recently enacted immigration laws that have given rise to visa restrictions for professionals from India, inconvenient customs procedures in India, allegations of snooping by the US National Security Agency on prominent leaders of the Bharatiya Janata Party (BJP), continuing US backing to Pakistan despite her support to the terror outfits and India's stand against going along with the Trade Facilitation Agreement at the WTO so as not to jeopardise food security for a sizeable segment of the Indian population regarded as poor.

The US Government has obviously reconciled to the election of the BJP-led Government in India and especially Narendra Modi being at the helm of affairs. The signals emanating from the US Government clearly reflect their desire to shed the baggage of the past and move forward. This spirit is encapsulated in the words of Assistant Secretary of State for South and Central Asia Nisha Desai Biswal who stated, "We will focus on shared prosperity and strategic convergence—more specifically, how partnership between the US and India can make our countries and the entire global order more prosperous and more secure."

While John Kerry generated the right political vibes, what was totally absent in his interaction at different levels was the need to foster the relationship between the two nations in the regime of defence. This was made up to some extent by the back-to-back visit to Delhi by Chuck Hagel, the US Defense Secretary, from August 7 to 9, 2014. While the IAF has been able to partially revamp its transport fleet through the foreign military sales programme of the US Government, Hagel's visit was intended to inspire the Indian Government to provide a fresh impetus to the several long pending transactions related to military hardware such as for the AH-64D Apache attack helicopters, CH-47F Chinook heavy-lift helicopters, additional P-8I maritime surveillance aircraft, additional C-17 Globemaster III strategic air-lift aircraft, Javelin anti-tank missiles and M-777 Howitzer guns altogether valued at over $10 billion. However, the US Defense Secretary was not quite happy about the policy of the Indian Government of the recently enunciated policy on foreign direct investment in the defence industry. He also expressed apprehension about the bureaucratic impediments that tend to slow down or obstruct defence deals. The Secretary Chuck Hagel's visit to India reiterated the intent of the US to propel the relationship to a new level through engagement in the regime of defence cooperation.

While the representatives of the Indian Government negotiate with their counterparts from the US to put bilateral relations between the two nations on even keel, they need to bear in mind that the stake of the Indian armed forces in the achievement of this objective is very high. SP

—By Air Marshal B.K. Pandey (Retd)

PHOTOGRAPH: PIB

CREDIBLE PERFORMANCE:
PILATUS PC-7 MKII

PHOTOGRAPH: PILATUS

THE MAKING OF AN IAF COMBAT PILOT

With the induction of this lead-in trainer beginning in 2008, the long-standing gap between the performance of the basic jet trainer and frontline combat aircraft has been effectively bridged

BY AIR MARSHAL B.K. PANDEY (RETD)

IN ITS POST-INDEPENDENCE HISTORY, the Indian Air Force (IAF) by and large, has had a fairly stable fleet of basic trainer aircraft most of it produced by the Indian aerospace major Hindustan Aeronautics Limited (HAL). However, there have been two areas in which the IAF has had to resort to procurement of trainer aircraft from abroad. The first was the Hawk 132 advanced jet trainer (AJT) from British Aerospace during the last decade and more recently, the Pilatus PC-7 MkII from Pilatus Aircraft of Switzerland.

THE ADVANCED JET TRAINER

For several decades of its existence, the training curriculum for fighter pilots in IAF was devoid of a platform that could serve as the critical transitional link between jet trainers and high performance combat aircraft. The need to close this gap through the induction of an AJT was articulated by the IAF for the first time in 1982. This was assessed as an urgent and an inescapable requirement as in the preceding decade-and-a-half the IAF had suffered number of accidents that were attributable to human error. A majority of these accidents involved fighter pilots who had graduated to the MiG-21 supersonic aircraft directly after training on basic jet trainers. In the search for a solution, the IAF soon after identified the Hawk, an aircraft with established credentials, to be the right platform to serve as the AJT. However, the elaborate procurement process took over two decades to reach the stage of award of contract.

Initially, the IAF had pegged the requirement at 122 aircraft. However, on account of the protracted negotiations and the consequent delay leading to cost escalation, the order was revised downwards to 66 aircraft with option for another 40. The contract for the supply of 66 Hawk 132 AJT aircraft, the latest in the series, that was finally signed between the Ministry of Defence and BAE Systems on March 26, 2004, envisaged 24 units built in the United Kingdom and the remaining 42 produced under licence by HAL at Bengaluru. As of today, including the repeat order for 40 aircraft for Stage III training and 20 additional aircraft for the new formation aerobatic team, the Hawk inventory of the IAF will reach 126. With the 17 naval version of the Hawk ordered by the Indian Navy, the total number would go up to 143.

The Hawk formally entered service with the IAF on February 23, 2008 and within three years, the AJT fleet was built up to full strength. In the meantime, in 2010, the IAF declared its intention to order another 40 aircraft that would be manufactured under licence by HAL. On February 10, 2011, HAL signed a contract with GE Aviation to provide maintenance on the Hawk fleet for the next 30 years. Thereafter in December 2011, BAE received a contract to provide the IAF with spares and ground support for the Hawk fleet.

A BAE HAWK 132 ADVANCED JET TRAINER OF THE IAF ON A TRAINING MISSION

PHOTOGRAPH: BAE SYSTEMS

QUALITATIVE CHANGE

Although the induction of the Hawk into the IAF was a long and arduous process spread over more than two decades, it has fulfilled a long pending requirement of the service and flags a major milestone in the domain of flying training of fighter pilots. With the induction of this lead-in trainer beginning in 2008, the long-standing gap between the performance of the basic jet trainer and frontline combat aircraft has been effectively bridged. Budding fighter pilots are now able to transit with relative ease from basic jet trainers such as the HJT-16, Kiran, on to high performance aircraft such as the MiG-29, Mirage 2000, the Su-30MKI and subsequently hopefully even on to the medium multi-role combat aircraft (MMRCA) as and when these are inducted into the IAF. The Hawk fleet has undoubtedly served to bring about a qualitative change in the training of combat pilots of the IAF and has definitely enhanced flight safety.

SEARCH FOR A BASIC TRAINER AIRCRAFT

With the rather sudden and premature grounding of the piston-engine HPT-32 fleet in July 2009, the IAF had a serious crisis on its hands as it was quite left with no aircraft for Stage I training. Designed, developed and built by HAL, the HPT-32 aircraft reportedly had an inherent design flaw on account of which there were a number of episodes of engine shut down in flight leading to loss of aircraft and lives. Circumstances compelled the IAF to carry out Stage I training on the HAL-built HJT-16 Kiran jet trainer that was being used for Stage II training. This arrangement was neither desirable nor sustainable.

As HAL was not in a position to provide a replacement for the HPT-32 in a respectable time frame, the IAF had no option but to explore foreign sources for a suitable platform and soon enough to resume Stage I training on a propeller driven aircraft. A global tender for a basic trainer aircraft floated on December 16, 2009, saw a number of contenders entering the fray namely Pilatus PC-7 MkII from Pilatus Aircraft of Switzerland, KT-1 from Korean Aerospace, the Texan T-6C from the then Hawker Beechcraft, the EMB-314 Super Tucano from Embraer, Alenia Aermacchi M-311 jet trainer from Finmeccanica, PZL-130 Orlik TC II from EADS and the G-120 TP from Grob Aircraft of Germany.

In May 2012, the IAF declared the Pilatus PC-7 MkII as the preferred platform. A contract was signed with Pilatus Aircraft of Switzerland for the supply of 75 aircraft in fly-away condition along with integrated ground based training system and a logistics support package. There was also the option for another 30 aircraft within three years of signing the contract.

Induction of the Pilatus PC-7 MkII commenced in February 2013 and deliveries are expected to be completed by 2015. Given

PILATUS PC-7 MKII

Produced by Pilatus Aircraft of Switzerland, the PC-7 MkII is a turboprop trainer aircraft intended for ab-initio flying training. The aircraft is in service with the air forces of India, South Africa, Botswana, Malaysia and Brunei. More than 160 PC-7 MkII trainer aircraft have been delivered since its introduction in 1994.

The aircraft is equipped with stepped tandem glass cockpit accommodating two crew members on ejection seats. The glass canopy offers unobstructed visibility for both cockpits. The ergonomically placed instruments, displays and controls ease the operation of the aircraft in all stages of flight. The tandem layout also allows the instructor to monitor, aid or override the actions of student pilots. The avionics suite integrates a primary flight display, multifunction display, electronics flight instrumentation system, distance measuring equipment and automatic direction finders. The aircraft is also equipped with a communications suite, anti-g system and an on-board oxygen generating system.

The PC-7 MkII is powered by a Pratt & Whitney PT6A-25C turboprop engine driving a Hartzell four-bladed aluminium propeller. Equipped with digital electronic engine control system, the engine delivers a maximum of 700 shaft horsepower and offers low operating cost.

The PC-7 MkII can fly at a maximum altitude of 33,000 feet, has a climb rate of 14.79 metres per second and cruise speed of 448 kmph at sea level. Its maximum operating speed is 556 kmph and its maximum range is 1,500 km. The take-off and landing distances at sea level are 415 m and 665 m respectively. The maximum certified g-load limit of the aircraft is +7g / -3.5g.

COMBAT READY:
BAE HAWK 132 JET TRAINER

the impeccable credentials of the original equipment manufacturer (OEM) Pilatus Aircraft of Switzerland, there ought to be no doubt about the time frame for completion of delivery of the 75 aircraft ordered.

PERFORMANCE PAR EXCELLENCE

Based at the Air Force Academy near Hyderabad, the premier flying training establishment of the IAF, the strength of the Pilatus fleet currently stands at 40. Since the commencement of induction in February 2003, the Pilatus fleet has recorded commendable performance logging around 15,000 hours of accident-free flying. The experience of the IAF indicates that the fleet demands low maintenance, offers high reliability and exceptional serviceability rates, all resulting in high flight line availability. The OEM Pilatus Aircraft of Switzerland has also been proactive in providing excellent product support. The credible performance of the fleet so far has inspired the IAF to embark on enhancement of intake of trainee pilots by 150 per cent as well as to increase the number hours in the basic flying training syllabus by 220 per cent. Solo flying by trainee pilots is also being increased from one to 14 sorties. This not only reflects a qualitative change in basic flying training in the IAF; but also the high level of confidence that the Pilatus PC-7 MkII fleet has generated in the IAF. As per Air Chief Marshal Arup Raha who flew a sortie on the aircraft during his visit to the Academy, the induction of Pilatus PC-7 MkII as a basic flying trainer has met the long aspired need of the IAF.

In March this year, the first PC-7 MkII fixed base full mission simulator became operational at AFA. The second simulator and additional ground-based training systems are to be installed by the end of this year. Also, reflecting clear preference for the Pilatus PC-7 MkII over the proposed HTT-40 to be designed, developed and built by HAL in a time frame that continues to remain highly uncertain, the IAF has placed orders for another 37 of these aircraft under follow-on contract that will take the fleet strength with the IAF to 112 against a total requirement of 180 machines. The IAF is once again compelled to resort to direct purchase from the OEM as HAL, on account of their own compulsions, are not inclined to build the Pilatus PC-7 MkII under licence which would have been far more expedient. SP

HAWK 132 TRAINER JET

The Hawk 132 is a fourth-generation variant of the highly successful BAE Systems Hawk advanced jet trainer. It incorporates an open architecture mission computer, glass cockpit and a state-of-the-art avionics suite including a new generation Inertial Navigation System with GPS (INGPS). It is also equipped with several Indian made components such as the communication sets, Identification Friend or Foe (IFF) system and the radio altimeter. In addition to being an advanced jet trainer, the Hawk 132 is fully combat capable as a lightweight fighter and can carry air-to-air missile and air-to-ground rockets, bombs and guns. The aircraft is equipped with advanced navigation systems.

The Hawk 132 can carry two extra fuel tanks under the wing, which considerably extend its strike range. The hands-on throttle and stick (HOTAS) system on the control column and throttle allows the pilot to make weapon selections without moving his hands away from the controls. The Hawk 132 is a proven aircraft and is currently operational in over 24 nations across the world. ●

PHOTOGRAPH: IAF

WELCOME TO OUR WORLD

Thom Richard is one of the few pilots in the world to possess the talent, experience and courage required to compete in the final of the famous Reno Air Races – the world's fastest motorsport. Less than ten champions are capable of vying with each other at speeds of almost 500 mph, flying wing to wing at the risk of their lives, just a few feet off the ground. It is for these elite aviators that Breitling develops its chronographs: sturdy, functional and ultra high-performance instruments all equipped with movements chronometer-certified by the COSC – the highest official benchmark in terms of reliability and precision. Welcome to the Breitling world.

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INSTRUMENTS FOR PROFESSIONALS™

E-FAN, THE ALL-ELECTRIC 2-SEATER DEVELOPED BY AIRBUS GROUP INNOVATIONS, PARKED UNDER THE WING OF THE A400M

PHOTOGRAPH: AIRBUS GROUP

UK BOOST TO DEFENCE INDUSTRY

The global defence market is estimated to be worth around £82 billion a year until 2022

BY R. CHANDRAKANTH
REPORTING FROM FARNBOROUGH, UK

WANNA FIGHT?
ALENIA M346 MEETS ANGRY BIRD

PHOTOGRAPH: G. (BERT) VAN LEEUWEN

FROM A MILITARY PERSPECTIVE, there was much anticipation to see the joint strike fighter (JSF) F-35B Lightning II, the new multi-role fighter, make its international debut at Farnborough. However, that did not happen. The US Department of Defense did not give it safety clearance as there was an unexplained fire on the aircraft three weeks earlier. However, the show had several highlights, particularly with several companies introducing innovative technologies for the first time.

The United Kingdom (UK), the host country, took the lead with the Prime Minister announcing on day one of the show that investments to the tune of £1.1 billion would be made to upgrade capabilities of the armed forces that would include £800 million for a new surveillance package and another £300 million for a new ice patrol ship and radar.

He also announced the setting up of a UK Defence Solutions Centre in Farnborough to develop new defence technologies, identify future market opportunities and work together to ensure they have the products and solutions that will be in demand. The global defence market is estimated to be worth around £82 billion a year until 2022.

Kallman Inc brought the largest US contingent of aerospace and defence companies, while there was scaled down presence of Russian military in the backdrop of the Ukraine crisis.

BOEING AND PARAMOUNT WILL BE ABLE TO PROVIDE CUSTOMERS WITH A UNIQUE PARTNERING OF DEFENCE SOLUTIONS AND CAPABILITIES

BOEING DEFENSE SOLUTIONS TO THE FORE

Boeing Defense, Space and Security (BDS), which showcased technologies that it could export, signed an agreement with

PHOTOGRAPHS: G. (BERT) VAN LEEUWEN, ROLLS-ROYCE

THE BIG BIRD:
HEAVY-LIFTER, THE MILITARY AIRBUS A400 ARRIVING AT THE AIRSHOW

Paramount Group, Africa's largest privately-owned defence and aerospace business, to jointly exploit defence and security opportunities in key international markets. The areas include border security, heavy airlift of products and personnel across vast distances, coastal piracy and anti-poaching, disaster and humanitarian relief as part of future coalition efforts.

"Boeing and Paramount will be able to provide new and existing customers with a unique partnering of defence solutions and capabilities, including the retrofitting or refurbishment of existing platforms, systems integration as well as training and maintenance support for any new acquisitions," said Chris Chadwick, President and CEO of Boeing Defense, Space and Security.

LOCKHEED MARTIN MOVES INTO UK SPACE

Lockheed Martin announced that it is opening a space technology office in Great Britain to explore partnership opportunities with UK businesses and universities to support the UK's goal of maintaining and growing its national capabilities in space. The new office will expand the company's relationships with the UK supply chain to share technology and expertise as well as support UK-based capabilities in space exploration and access. It will also explore new technologies from small businesses and academia. Current areas of focus include environmental monitoring, space exploration, global security and small communications satellites.

TACTICAL MOVES BY AIRBUS

Airbus Defence and Space presented the A400M on the ground and in the air. Equipped with state-of-the-art technologies, the A400M is not just suited to tactical and strategic/logistical missions, but also for special operations and air-to-air refuelling. The first A400M for the UK's Royal Air Force is due to be delivered in the autumn of 2014 and the second by the year end.

On static display, Airbus had two C-295s, new generation, highly versatile tactical airlifters. The C-295 is able to carry up to nine tonnes of payload or 71 personnel and has a maximum cruise speed of 480 kmph. Airbus also presented the "Atlante" Unmanned Aerial System, a medium altitude long endurance (MALE) tactical multi-payload unmanned aerial vehicle (UAV), designed to carry out target identification, shoot correction and damage evaluation operations, among other intelligence, surveillance, target acquisition and reconnaissance (ISTAR) missions.

TEXTRON BRINGS SCORPION

Europe got a first look at Textron's Scorpion, multi-mission aircraft, Scorpion, a light attack intelligence, surveillance and reconnaissance aircraft. Another Textron company, Bell Helicopter, had a fruitful outing signing a purchase agreement with INAER France an Avincis Group operator for a Bell 429 in Helicopter Emergency Medical Service (HEMS) configuration.

THALES SHOWCASES RANGE

Thales had several products and solutions on display and it released details of the new Thales Optronique targeting pod 'Talios' for the French Air Force. Designed as a follow-on to its Damocles targeting pod, the open architecture and sensor

F-35 FULL-SCALE
MODEL ON DISPLAY

PHOTOGRAPH: LOCKHEED MARTIN

payload allow Talios to operate as a multi-function pod, dealing with target acquisition and designation through to non-traditional intelligence, surveillance and reconnaissance (ISR) tasks.

RAFAEL'S CONCEPT TALK

The Israeli giant Rafael for the first time talked about TopLite multi-high definition electro-optical system (EOS), the most advanced version of the TopLite family of ISR and targeting systems for airborne, maritime, ground, homeland security and defence applications. It allows unique operational capabilities supplemented by additional state-of-the-art advanced image processing algorithms and applications.

RAYTHEON'S RANGE

Precision weapons, advanced gunfire detectors, tiny jammers and a bus-size radar that tracks missiles as they hurtle through space, were all part of Raytheon's technology showcase. The display included avionics and weapons with recent major contract awards such as the US Navy's air and missile defence radar and the Navy's next generation jammer.

"Developing a common understanding of the complexity of the security challenges in today's global environment is the first step towards building a strong customer relationship," explains Thomas A. Kennedy, CEO, Raytheon. "The Farnborough International Airshow has historically provided us with an ideal opportunity to showcase our technology and product portfolio to customers from around the world. Defining the right mix of cost-effective solutions to support our customers' needs drives solid business partnership and shared success."

OIS AEROSPACE PLATFORMS

OIS Aerospace displayed its all-new aircraft, helicopter & avionics simulator development platform for India. Other lead announcements by OIS AeroSpace included its strategic relationship with Logic SpA of Italy for its industry leading avionics as its OEM in India and the debut of its SkyArrow based 'iObserver' homeland security surveillance platform. OIS also presented the hand-held micro, mini, fixed-wing UAVs and quad copters for both surveillance and tactical monitoring applications. The Group has developed the world's first true 3D bird detection radar which exceeds FAA's recommended specifications for bird detection for flight safety. The product has completed trials in pursuit of the Indian Air Force tender of 45 bird detection radars, the world's largest such opportunity.

Sanjay Bhandari, Founder, Chairman and Managing Director, said R&D lies at its heart as the Group continues to push ahead with its development programmes and products such as its advanced synthetic aperture foliage detection radar.

BAE FOCUS ON TARANIS

BAE Systems and the British Ministry of Defence demonstrated several new radar-evading stealth technologies during recent flight trials of their Taranis drone programme. Under development since 2006, Taranis is a once-secret developmental stealthy drone programme jointly funded by BAE Systems and the UK's Ministry of Defence. Other industry participants include engine-builder Rolls-Royce, QinetiQ and GE Aviation.

With the announcements by the British Prime Minister, there appears to be fresh momentum to technology initiatives and partnerships. SP

WITH THE ANNOUNCEMENTS BY THE BRITISH PRIME MINISTER, THERE APPEARS TO BE FRESH MOMENTUM TO TECHNOLOGY INITIATIVES AND PARTNERSHIPS.

ROCKWELL COLLINS - TRAILBLAZING CAPABILITY

Rockwell Collins will continue its focus on India and is really enthused with the recent change of government

ACKNOWLEDGING THE IMPORTANCE OF Farnborough International Airshow, Rockwell Collins, a pioneer in the development and deployment of innovative communication and aviation electronic solutions for both commercial and government applications, showcased high-end technologies which wowed the aviation community. Though the joint strike fighter F-35 may have been conspicuous by its absence, an undeterred Rockwell Collins presented the F-35 Helmet Mounted Display Systems (HMDS). In an interview at Farnborough, the Senior Vice President (International & Service Solutions) Colin R. Mahoney spoke about the prospects in India following the change of government here.

SP's Aviation **(SP's): How has the Farnborough International Airshow been till date for Rockwell Collins?**
Colin R. Mahoney (Mahoney): The going has been good so far. Farnborough helps us tell the story of how we are well positioned internationally and how our products fit with international customer needs. More importantly, it allows us to meet new customers in one location very easily. Farnborough is a truly international show and one of the four big shows in the world. One needs to be here to keep the momentum going. We see a broad spectrum of people coming to the show from India, Brazil, China, Japan, Middle East, Latin America and other countries.

SP's: What is Rockwell Collins focusing on at the show?
Mahoney: This year Farnborough is really exciting and we have on display many offerings such as the F-35 HMDS, MultiScan ThreatTrack Weather Radar, EVS-300 Enhanced Vision System and HeliSure situational awareness system. These are being displayed for the first time at the show. We are pretty excited about the F-35 HMDS and customers visiting our stand can wear the F-35 HMDS and experience what a pilot may experience.

SP's: You have a presence in about 150 countries. Could you give us a low-down on your India footprint?
Mahoney: We established the Rockwell India Design Centre in Hyderabad in 2008 and the growth of the centre has enthused us to expand our presence. The Hyderabad Centre has a great leader in place and the attrition rate is low and we have plenty of room to grow. The facility has built up to over 600 engineering professionals since its inception in 2008. Besides the India Centre, Rockwell Collins has nurtured its joint ventures/partnerships with Air Works and Indamer which are into general aviation segment.

SP's: What is your view of the Indian market?
Mahoney: The world is aware of the strength of the emerging economies and India is right on top. Rockwell Collins will continue its focus on India and we are really enthused with the recent change of government. We expect the Bharatiya Janata Party Government led by Narendra Modi as the Prime Minister, will put development on the fast-track. We expect decision-making to be faster and transparent. The new government has already shown the intent to free the decision-making processes.

SP's: The new Indian Government has announced increase of foreign direct investment (FDI) from 26 to 49 per cent. Do you think that is good enough for global original equipment manufacturers to transfer high-end technologies?
Mahoney: The FDI in defence from 26 to 49 per cent is more or less status quo. The OEMs have been expecting higher equity as to have control and also transfer technologies. Increasing the upper limit of the FDI cap is not going to make significant changes, however the changed mindset of the government is encouraging for not just Rockwell Collins, but also for the other investors.

SP's: Could you tell us about how the Hyderabad Centre is contributing to Rockwell Collins?
Mahoney: The India Design Centre in Hyderabad is doing extremely well and is contributing significantly to the technology development of the company. For example, the information management systems developed for the A350 which is a 'trailblazing capability', is from the Centre. It is brand new technology and is the result of the synergised efforts of Airbus, Rockwell Collins at Cedar Rapids, USA and the India Design Centre in Hyderabad.The Hyderabad Centre has a great leader in place and the attrition rate is low and we have plenty of room to grow. The facility which started in 2008, now has over 600 engineering professionals and continues to expand.

SP's: Which of the two businesses, commercial and government, is adding to Rockwell's revenues from India?
Mahoney: It is skewed towards commercial with majority of the airlines in India equipped with Rockwell Collins solutions. As regards defence, Rockwell Collins is looking at the Battle Management Systems (BMS), naval communication, etc. The focus is to bring the best of Rockwell Collins technologies to India.

—By R. Chandrakanth

1964-2014 50 YEARS OF SP'S

NEARLY 7,000 LIVES SAVED

It is the pilots' last chance to get out alive

THE CHALET OF MARTIN-BAKER at Farnborough International Airshow was a show-stopper. Not that it was designed in a unique or extraordinary way. It was simple, but the words on the Chalet exterior stopped everyone in their tracks. Nearly 7,000 lives saved, it said. And any life saved is certainly worth looking at what helped save that life.

IT IS THE EJECTION SEAT

It was on April 1, 1961, the first live static rocket ejection seat test took place with pilot Doddy Hay and with Sir James Martin overseeing it. From then there has been no looking back and Martin-Baker, the world's leading manufacturer of ejection seats, has come to the rescue of many a military pilot in a near-death situation. "It is the pilot's last chance to get out alive," avers Geoff Barnes, Head of Programmes, Martin-Baker.

Martin-Baker, proudly announces Barnes, has been the first company to productionise a concept and make good business out of it. "We are the market leaders with over 70 per cent share. It is not because we started early, but because of our reliability factor. We have around 30 successful ejections in a year."

It is the only company that can offer a fully integrated escape system that satisfies the very latest in pilot operational capability and safety standards. Martin-Baker offers a complete 'end-to-end service', from helping the customer to establish operational safety and escape requirements, including design, development and qualification, to ongoing support throughout the entire service life of the aircraft.

Every facet of the safety system from initiation, escape path clearance, ejection sequencing, stabilisation, life support and parachute descent to final rescue, must work perfectly to safeguard a precious life. The company has accordingly developed a range of special crashworthy seats for helicopters and fixed-wing aircraft. These crash attenuating seats can be fitted in most maritime patrol and reconnaissance aircraft. Martin-Baker currently equips over 60 helicopter variants with crashworthy seats.

Barnes mentions "Our ejection seats are 25 different platforms on both fixed- and rotary-wing." Martin-Baker has manufactured ejection seats continuously since 1946, producing over 75,000 seats to date. "There are almost about 30 successful ejections in a year," he says and adds that how the pilots acknowledge its importance.

Displaying the MK17 ejection seat at the show, he states, that it is the latest and is on the F-35 joint strike fighter. Mk17 is for a light aircraft, nevertheless it can go up to F-35 II. It has the latest technology with an inflatable neck guard that protects the head when moving at high speeds.

"ON FEBRUARY 18, 2014, I EJECTED FROM MY KFIR APPROXIMATELY TEN MINUTES AFTER TAKEOFF. WE HAD A CRITICAL FAILURE IN THE ENGINE, WHICH LED TO HAVING TO USE OUR EJECTION SEAT. THANKS TO MARTIN-BAKER FOR ALLOWING ME TO SEE, ONCE AGAIN, MY BELOVED WIFE AND MY DEAR CHILDREN."

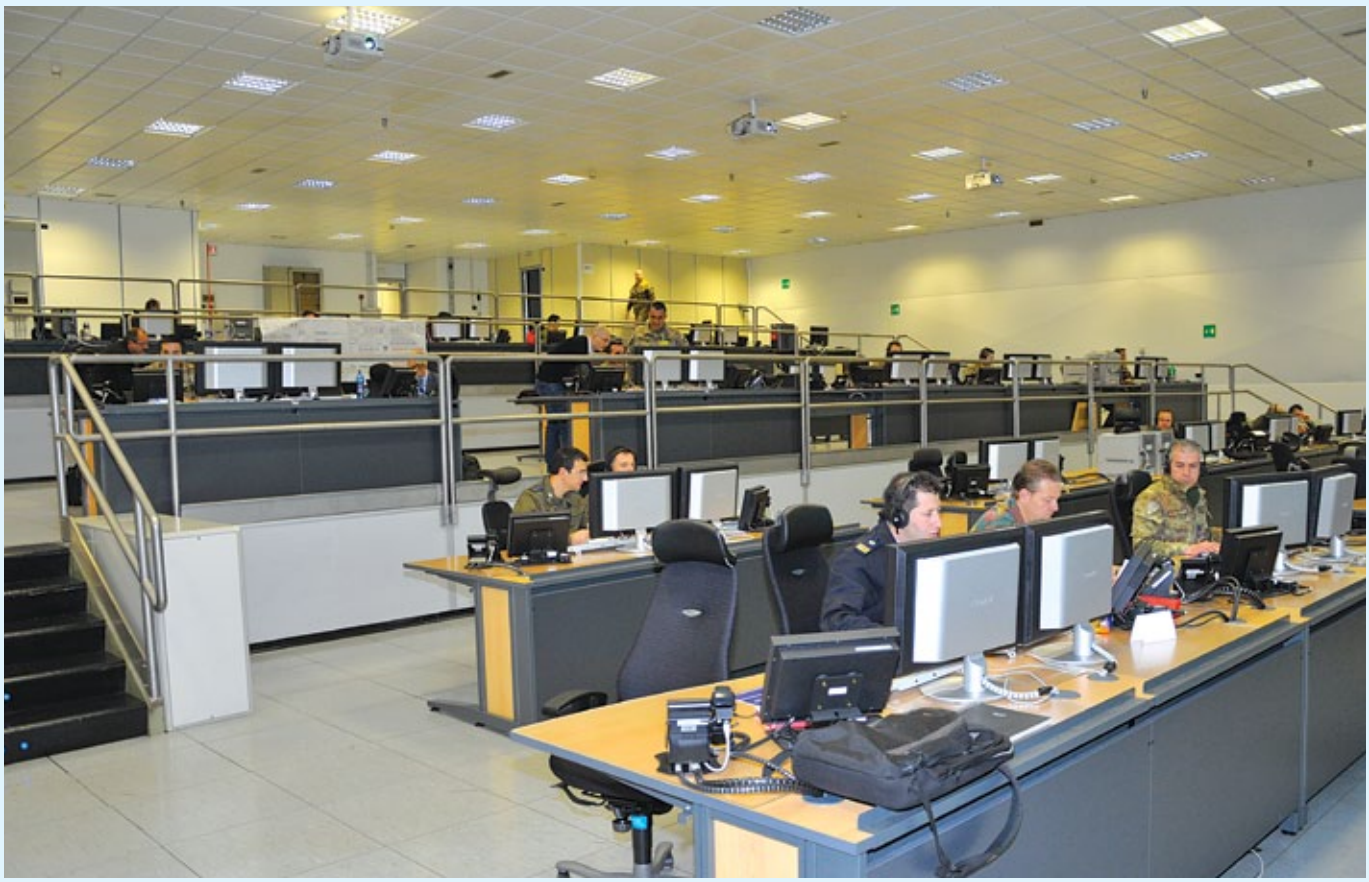
—CAPTAIN ANTONIO JOSE NIÑO "HOGAN", COLOMBIAN AIR FORCE

The Mk17 ultra lightweight escape system is compact and very simple in design and operation. It has been developed specifically for basic and primary trainer aircraft where seat weight and size are critically important. Life-cycle cost considerations are also a primary design driver, resulting in a seat design with only 50 per cent the pyrotechnic device count of other modern ejection seats and minimal maintenance overheads. The seat provides safe escape capability for aircraft speeds in the range 60 knots at ground level to 250 knots calibrated airspeed (KCAS) and pressure altitudes in the range sea level to 25,000 ft. It is capable of providing safe escape for aircrew in the weight range 103 to 245 lbs (47 to 111 kg) nude. The Mk17 escape system provides safe means of escape from a basic training aircraft, a feature which hitherto has been unavailable. Other benefits include low life-cycle costs, half the pyrotechnic cartridges required for Mk16, no under seat rocket motor and minimal maintenance overheads.

When asked about Martin-Baker's presence in India, Barnes mentioned that the zero-zero ejection seats are fitted on the light combat aircraft (LCA) Tejas and on the Hawk 132 advanced jet trainer. Similarly, all the Pilatus aircraft which the Indian Air Force is acquiring will have ejections seats from Martin-Baker. "We have a very strong relationship with the Indian Air Force." SP

—By R. Chandrakanth

PHOTOGRAPH: R. CHANDRAKANTH / SP GUIDE PUBNS



PHOTOGRAPH: COMANDO OPERAZIONI AEREE / THALESRAYTHEON SYSTEMS

BUILDING A COMMAND 'AIR PICTURE'

The ThalesRaytheon Air Command and Control System programme is said to be the largest cloud operation in the world

AT FARNBOROUGH, THALESRAYTHEON SYSTEMS was making a major pitch to British authorities, hoping that the United Kingdom (UK) would join the NATO's Air Command and Control System (ACCS) programme. The ambitious NATO programme is to have a single system for air operation among its members. Disclosing this to *SP's Aviation,* the Vice President, NATO Business Development, ThalesRaytheon Systems, Stephane Lavigne, said that NATO's ACCS is now delivering a system that networks air command and control systems across 17 locations in NATO Europe using the same system of hardware and software and sharing operational data over a high-speed communications network. The focus is on inter-operability among the NATO countries. The programme is in real time and it involves the full-chain of air command of operation. There is integration at the geographical level and at the operational level.

The highlight of the ACCS programme, he said, is to build a command 'air picture' and to detect any missile launch in the region. It is the biggest cloud operation in the world. In the first phase, Germany, Italy, France and Belgium were part of the programme and now 11 additional countries are part of it. These include Turkey, the Netherlands, Norway, Portugal, Spain, Denmark, Poland, Czech Republic, Hungary and Greece.

"The UK is part of the NATO and it is the right time for it to consider joining the ACCS programme," he said. The project helps in mission planning, tasking and networking. More importantly, it monitors ballistic missile launches and is a coordinated effort for ballistic missile defence. NATO ACCS sets new standards of integration for air operations in Europe, providing a single, integrated approach to planning, tasking, monitoring and mission execution.

In the future, ACCS will integrate missile defence command and control for NATO, interoperability with Air Ground Surveillance (AGS) and intelligence, surveillance and reconnaissance (ISR) and sensor to shooter mission execution. SP

—By R. Chandrakanth

BEECHCRAFT'S AMAZING RANGE

The Beechcraft products, particularly the King Air turboprops, are utilised around the globe in a number of services

THE ENTIRE PRODUCT RANGE of Beechcraft and Cessna products were available in special mission configurations at the Farnborough International Airshow held recently. All 20 current production aircraft – including a Special Mission Beechcraft King Air 350ER were on display – fit numerous mission profiles, including aerial survey, air ambulance, flight inspection, aerial surveillance, training and utility transport.

"With the combination of the Beechcraft and Cessna products within Textron Aviation, we now offer the largest proposition of special mission platforms in the industry," said Dan Keady, Vice President, Special Missions. "We have seen a significant growth in special mission activity around the globe and anticipate this market will continue to grow across our aircraft platforms. From our piston-engine Beechcraft and Cessna products up to the largest Citation business jets, we are able to offer our customers an aircraft to fit just about any mission requirement."

The Beechcraft products, particularly the King Air turboprops, are utilized around the globe in a number of services including air ambulance, intelligence, surveillance and reconnaissance (ISR), maritime patrol and pilot training, while the Cessna product line lends itself to multiple special mission roles from piston trainers, to the multi-purposed Caravan operating in an air ambulance, cargo, parachute and float plane platforms.

"There have been a number of factors fuelling the special mission business," Keady said. "Two key factors include advances in onboard technology, which means aircraft such as our turboprops can be used for missions previously requiring larger, more expensive military aircraft. In addition, more organisations are looking to use their business aircraft for multiple roles, which could include using a King Air for executive or utility transport while having the ability to quickly adapt it to an air ambulance configuration, for example."

PHOTOGRAPH: BEECHCRAFT

RANGE OF SOLUTIONS FOR DEFENCE MARKET

Beechcraft announced that it had delivered the first of four Beechcraft King Air 350ER aircraft to the Mexican Navy Secretaría de Marina (SEMAR), besides providing support with on-the-ground service, support and training through its Global Mission Support organisation. Textron Aviation displayed a specially modified Beechcraft King Air 350ER which is fitted with a unique and flexible mission package that supports search and rescue, fishery inspection, pollution monitoring and seaway/shipping lane surveillance missions. The King Air 350ER was selected for these missions due to its high dash speeds, long endurance, high reliability and low operating cost. Beechcraft Defense displayed its T-6C trainer and AT-6 light attack aircraft.

T-6 CONTRACT WITH US GOVERNMENT

It said that it had signed a contract in May with the US Air Force for production of 29 Beechcraft T-6 training aircraft. Valued at $171 million, this represents the 20th production lot of T-6 aircraft ordered by the US Air Force (USAF), US Navy (USN) and US Army as part of the Joint Primary Aircraft Training System (JPATS) procurement programme.

Beechcraft also launched a new demonstrator dedicated to showcasing the ISR capabilities of its Baron G58 piston-engine aircraft. The Baron G58 ISR package includes a FLIR 230-HD electro-optical/infrared (EO/IR) camera system, an operator's console that houses the mapping/mission management computer, a recorder and a multi-band communications radio system and data link for special mission operators. The 230-HD EO/IR camera has the ability to virtually see both day and night, over land and water, in both good and poor weather. The mission mapping system provides the camera operator with a visual representation of the target location. The multi-band communications radio gives the flight crew and the sensor operator the ability to communicate directly with the military, police vehicles, coast guard and other maritime vessels and the recorder provides court admissible evidence for prosecution. SP

—By R. Chandrakanth

INTEREST IN HAL SOARS

The company is planning major expansion into the civil aviation business beyond its established portfolio of military activities

HAL AND UKTI MEETING JULY ON 14, 2014

INDIA'S AEROSPACE BEHEMOTH, HINDUSTAN Aeronautics Ltd (HAL) had a good outing at Farnborough this year with several companies wanting to have a tie-up in various areas, knowing fully well the kind of market, partnerships are likely to open up.

There was a lot of excitement about India's proposal for a Regional Civil Aircraft programme, a 70-90 seater aircraft. The UK Trade and Investment (UKTI) made the first moves with its Director Carole Sweeney stating that a number of UK industries would be keen on participating in the programme, given the expertise and skills they had.

The HAL Chairman Dr. R.K. Tyagi assured the Director that India will certainly be looking at partnerships to take the regional transport programme forward. He said that soon a request for proposal (RFP) would be issued for the engine of the aircraft as 11 bidders had already responded to the recent request for information (RFI) issued. The aircraft would be manufactured in India with an expected roll-out by 2022. The UK industries will have their opportunities, he added.

T. Suvarna Raju, Director, D&D of HAL, said: "In the initial period we expect around 400 aircraft to be produced. This is conservative estimate and the potential is much more considering that India has 450 airstrips and more cities would be linked with air travel in future." HAL and National Aerospace Laboratories (NAL) have taken the lead to build this aircraft on public-private partnership model. A special purpose vehicle (SPV) is being formed by HAL and NAL to steer this project.

Some of the key representatives from UK industries such as ADS Group, Aircraft Research Association, Cobham, Cranfield University, Meggitt, Rolls-Royce, Stirling Dynamics, Ultra Controls, UTAS, UKIBC were present in the meeting. "Many more who are not present in this meeting would be interested to be part of this project", said Sweeny. She welcomed HAL's idea of holding a technical workshop on the subject in near future to understand the subject in detail.

BAHRAIN EVINCES INTEREST FOR THEIR HAWK FLEET

Bahrain's Minister for Transport Kamal bin Ahmed Mohamed who also looks after his country's defence matters, visited HAL Chalet at Farnborough, and evinced keen interest in HAL's activities. At a meeting with HAL Chairman Dr Tyagi and company directors, he sought HAL's technical support in maintaining the Hawk fleet of Bahrain Air Force.

He also urged HAL to increase its participation level at the biennial Bahrain Airshow. "Without HAL, our shows are incomplete." He felt that Indian Defence companies have a lot to offer to the Gulf Cooperation Council (GCC) countries and Bahrain could play a key role in all this.

THALES TO FURTHER STRENGTHEN STRATEGIC PARTNERSHIP

The CEO of Thales, Jean-Bernard Lavy called on HAL team and expressed his keen desire to take forward the ongoing business activities in India in cooperation with HAL. He told HAL Chairman and Directors that Thales would have a strategic look at India given the business potential in defence sector and he would be in India with his team sometime in November this year.

Thales, a major global aerospace company with over 100 years of experience is involved with HAL in Mirage 2000 upgradation programme and extends technical support to several major HAL platforms. Lavy emphasised on structuring all the activities over certain period rather than handling each project on case by case basis. The Airbus Helicopter CEO and President, Guillaume Faury and his team also met the HAL top executives. The Airbus Helicopter is involved with HAL Cheetah and Chetak projects but expressed the desire to play a greater role in Indian helicopter market which has huge potential. They seemed keen on Indian Multi-role Helicopters (IMRH) and Navy Multi-role Helicopters (NMRH). The HAL Chairman stressed on association that creates value and jobs for the country. SP

—By R. Chandrakanth

PHOTOGRAPH: HAL

BAE'S BREAKTHROUGH TECHNOLOGIES

The key programmes showcased by BAE Systems included Striker II HMD, Taranis UAV system, Fighter upgrade programmes

BAE SYSTEMS PRESENTED a range of technologies covering air, electronics, security, etc. at Farnborough.

First up, BAE systems unveiled its Striker II Helmet-Mounted Display (HMD), a fully digital solution that provides today's combat pilot with exceptional night vision and target tracking technology, integrated within a visor-projected system. With decades of combat-proven experience, the new platform-agnostic Striker II HMD builds upon BAE Systems' current Striker HMD, which has been successfully deployed on Eurofighter Typhoon and Gripen fleets.

"As the industry transitions from analogue to digital display solutions, Striker II brings a superior, fully digital capability to multiple platform types," said Joseph Senftle, Vice President and General Manager for Communications and Controls Solutions at BAE Systems. "Designed to address evolving mission requirements with advanced digital night vision technology, our new HMD was built to be 'future proof' and seamlessly adaptable to technology advancements in the years ahead."

Delivering breakthrough abilities for night combat, the Striker II brings its high performance digital night vision camera inside the helmet, which helps reduce g-force effects on the pilot's head and neck to improve comfort, and eliminates the need to manually configure and adjust night vision goggle (NVG) hardware for day-to-night transitions. With its binocular visor-projected display performance, the new system integrates a centre-mounted ISIE™-11 sensor based on Intevac Photonics' patented advanced imaging sensor technology, known as the electron bombarded active pixel sensor (EBAPS™). This advanced sensor strengthens the display's night vision acuity — bringing the system's night vision performance to a level equal to or better than HMDs using current NVGs. The new configuration also significantly reduces weight, when compared to today's HMD/NVG solutions.

This next-generation HMD also includes a cutting-edge tracking system that ensures the pilot's exact head position and the aircraft computer system are continuously in sync, reducing problems common to other HMDs. The Striker II tracking system, with new hybrid opto-inertial technology, eliminates any delay in determining where the pilot is looking and can therefore perfectly position symbology onto the visor. The results are high-precision target tracking and engagement as well as superior situational awareness and mission effectiveness.

TARANIS, THUNDERS ITS WAY

Taranis is an unmanned combat air system (UCAS) demonstrator which is said to help the UK Ministry of Defence with experimental evidence that will help to shape the future mix of manned and unmanned fast-jet aircraft. BAE Systems states that the UCAV is the 'most advanced aircraft ever produced in the UK."

BAE Systems presented the Taranis at the show, stating that it had recently successfully completed a second phase of flight testing. The Minister for Defence Equipment, Support and Technology Philip Dunne said: "The success of these test flights is an important milestone for the Taranis project. We are gaining vital insights into the potential of unmanned aircraft and this knowledge will shape future capabilities and help reduce the risks faced by military personnel on the frontline. I am determined to continue investing in these world-leading projects to show us the future, today."

Taranis is designed to be the prototype for a combat drone – capable of carrying out long-range strikes in hostile territory. "The Taranis project is a tremendous example of how the UK Government and industry can work together," said BAE's Chris Garside, Engineering Director of Future Combat Systems.

F-16 UPGRADE

BAE Systems also highlighted the upgrade to aircraft avionics of the F-16 fighter. Consequent to South Korea's selection of BAE Systems' upgrade solution in 2012, there is now a choice of upgrade providers for the 28 customers who currently operate a staggering 138 different configurations of F-16. The Korea deal "really did change the landscape" for F-16 upgrade programmes, said John Bean, BAE Systems' Global Fighter Programmes Business Vice President and General Manager. SP

—By R. Chandrakanth

THE DIGITAL HELMET-MOUNTED DISPLAY SYSTEM STRIKER II

PHOTOGRAPH: BAE SYSTEMS

RED ARROWS WITH AIRBUS A380 IN THE FOREGROUND

DELUGE OF ORDERS

The Farnborough International Airshow (FIA) held in July did phenomenal business with orders and commitments achieving a new record of $201 billion, reflecting buoyancy of the aerospace industry

BY R. CHANDRAKANTH
REPORTING FROM FARNBOROUGH, UK

PHOTOGRAPH: AIRBUS GROUP

BOEING 787-9 DREAMLINER IN ACTION AT THE SHOW

THE WEATHER AT FARNBOROUGH during the biannual International Airshow is so typically English – unpredictable, fluctuating between rain and sunshine. In 2012, it was raining, so were the orders. In 2014, it was bright and sunny and it was a deluge of orders. A whopping $201 billion worth of confirmed orders and commitments, the show couldn't have asked for more. Farnborough International Ltd (FIL) confirmed the total sum of orders and commitments had reached $201 billion, beating all previous records. The figure represents an extremely positive note for the global aerospace industry. Threre were orders and commitments for 1,600 civil jet engines valued at of $34.5 billion, over 1,100 aircraft worth $152 billion. and service contracts for $14.5 billion, all reflecting buoyancy of the aerospace industry.

Shaun Ormrod, Chief Executive for FIL, said, "We are extremely pleased by these numbers, there is already an order backlog and these additional orders will keep manufacturers in business and people employed for some years to come. It is great news for UK business and the economy."

PHOTOGRAPH: ROLLS-ROYCE

AIRBUS LEADS THE CHARGE

The first day of FIA 2014 saw a flood of orders and commitments for new commercial aircraft and engines and also the launch of the Airbus A330-800neo and the A330-900neo as well as the launch of the Trent 7000 which will be the exclusive engine on the A330neo. The launch of the new aircraft was followed by an announcement that Air Lease Corporation had signed a memorandum of understanding (MoU) for 25 A330-900neo aircraft, becoming the first launch customer for this new wide-body.

By 3:00 p.m., there were firm orders and commitments for 326 large commercial jets and regional aircraft with a combined value of $33.3 billion. In addition there were orders and commitments for a total of 674 jet engines with a combined value of $8.6 billion. The show was rolling.

The Airbus Chief Executive Fabrice Bregier declared it "The best Farnborough Air Show in Airbus history in terms of jet sales. I am personally very happy." Airbus had won during the week business worth over $75 billion for 496 aircraft, a new Airbus record at Farnborough. The deals comprise MoU for 138 aircraft worth $36.9 billion and purchase orders for 358 aircraft for $38.4 billion.

In the single-aisle sector, Airbus A320 family garnered an impressive 363 commitments worth $39 billion. Of these, orders for 317 A320neo and A321neo aircraft worth $34.4 billion are a further reflection of how the A320neo family continues to outpace the competition. To add icing to the cake, Airbus achieved the 3,000th A320neo sale during the show. The milestone was reached when SMBC Aviation Capital ordered 110 A320neo aircraft, marking the show's biggest vote of confidence for the leading single-aisle airliner.

John Leahy, Chief Operating Officer, Customers, Airbus,

LEAP-1B BEGAN GROUND TESTING JUNE 13, 2014, THREE DAYS AHEAD OF SCHEDULE, AT SNECMA FACILITIES IN VILLAROCHE, FRANCE

said, "Orders and commitments we've received at this record-breaking Farnborough for both the A330neo and A320neo families are together an unequivocally resounding endorsement for these most cost-efficient aircraft. For both our single-aisle and wide-body categories, the high representation of lessors, widely regarded as the global 'barometer' of the industry, is indicative of the long-term confidence in the capacity needs for sustainable growth for the airlines in the years ahead."

BOEING UP CLOSE

Boeing's order book at Farnborough does not certainly match that of the European giant, but the American airframer which marked its 40th year at Farnborough, highlighted its innovative, efficient commercial airplanes and its advanced defence capabilities. Boeing announced a new 200-seat 737 MAX 8 option that will give airlines up to 11 more seats of revenue. This latest addition to Boeing's comprehensive product and services line-up will deliver 20 per cent fuel-consumption savings compared to today's Next-Generation 737.

Boeing also announced details about the interior of the future 777X. The new model will build on the award-winning interior of today's 777 and apply 787 Dreamliner cabin innovations i.e. higher cabin humidity, windows more than 15 per cent larger and a cabin that is 16 inches wider than the competitor, allowing airlines a variety of economy class seat widths.

Boeing unveiled its new Maritime Surveillance Aircraft based on a Bombardier Challenger 605 business jet. This will provide customers with maritime and overland surveillance, anti-piracy, coastal security and search-and-rescue capabilities. It also signed a memorandum of collaboration with Paramount Group to jointly develop defence and security opportunities in key international markets

"Over 40 years of exhibiting at Farnborough, Boeing has consistently demonstrated its commitment and drive to innovate and develop game-changing products, equipment and services across the commercial and defence sectors," said Charlie Miller, Vice President, International Communications. "Farnborough 2014 was filled with excitement and enthusiasm among our customers, partners and suppliers reflecting strong endorsement of our product line. Commercial orders received bring our tally this year to 783."

BOMBARDIER'S GREAT WEEK

Bombardier Aerospace announced firm orders, conditional purchase agreements and letters of intent for a total of 74 aircraft, valued at over $4.25 billion. "It has been a great week for Bombardier at the Farnborough Airshow and I'm very pleased with the momentum we're building across our entire product portfolio. Our discussions with customers have progressed and we were very pleased to make a number of announcements," said Guy C. Hachey, President and CEO , Bombardier Aerospace.

Bombardier Commercial Aircraft kicked off the airshow by announcing the signing of two letters of intent (LOIs) for up to 24 CS-100 aircraft by Falko Regional Aircraft Limited. With orders by Loong Air, Petra Airlines and an undisclosed African airline, the list of customers for CSeries aircraft grew to 20. In addition, an existing customer signed a conditional purchase agreement for up to 13 CS300 aircraft. In addition, AirBaltic and Falcon Aviation contributed to bringing the number of firm orders to 513.

Bombardier demonstrated its path towards the entry-into-service of the CSeries aircraft by launching the Smart Parts programme and announced the approval of the all-new jetliner's maintenance, both geared towards maximising utilisation and providing more competitive maintenance costs to operators of CSeries aircraft.

On the Q-400 NextGen aircraft programme, Bombardier celebrated surpassing the milestone of 500 firm orders with the latest order from Horizon Air and Nok Air. In addition, Bombardier signed an LOI for five Q-400 NextGen turboprops with Falcon Aviation., Bombardier officially announced a cargo-passenger combi configuration of the turboprop. The Q-400 NextGen aircraft on static display was joined by a CRJ-900 NextGen aircraft in American Airlines' livery and Bombardier showcased the enhancements in its regional jet programme, including up to 5.5 per cent lower fuel consumption than earlier-generation CRJ-900 aircraft. Bombardier also shared its vision of double-digit fuel burn reduction by 2020.

Bombardier Business Aircraft had a full range of its industry-leading aircraft on static display, including the Learjet 75, Challenger 350, Challenger 605 and Global 6000 jets. The event marked the European debut and first public appearance for the Challenger 350.

ATR GUNG-HO ABOUT REGIONAL TRENDS

The turboprop aircraft manufacturer announced receipt of firm orders for 144 aircraft (119 ATR-72-600 and 25 ATR-42-600), with options for another 112 since January 2014. This year's contracts represent a total value of over $3.45 billion and $6 billion including options. These represent 150 per cent of sales for 2013. They will allow ATR to further strengthen its leading position and thus confirm the predominance of turboprop aircraft and particularly those of ATR in regional aviation.

Nordic Aviation Capital (NAC) placed an order for 75 ATR-42-600 valued at $1.55 billion Making NAC the largest ATR customer. Patrick de Castelbajac, ATR's CEO declared "We are delighted to see NAC placing another very important order for the world's best-selling regional aircraft. Today at the Farnborough Airshow, where ATR and NAC finalised a contract covering 75 new ATR-600s, we have confirmed once again the

IN THE SINGLE-AISLE SECTOR, AIRBUS A320 FAMILY GARNERED AN IMPRESSIVE 363 COMMITMENTS WORTH $39 BILLION

PHOTOGRAPH: CFM

growing trend for our customers to have a balance between purchasing and leasing their ATR aircraft. ATR represents a solid investment for leasing companies."

ROLLS-ROYCE REVS UP

Rolls-Royce debuted the Trent XWB engine on Airbus A350 XWB and the new 'stretch' Boeing 787-9 Dreamliner. The selection of the new Rolls-Royce Trent 7000 engine as the exclusive power plant for Airbus's A330neo aircraft preceded selection announcements by AirAsia X (50 aircraft), Transaero Airlines (12) and lessors Air Lease Corporation (25), CIT (15) and Avolon (15). The Trent 7000 builds on the market-leading Trent 700 to deliver significant performance benefits, improving specific fuel consumption by ten per cent and halving perceived noise.

Rolls-Royce also announced an $86 million order from lessor MG Aviation for Trent 1000 engines to power two Boeing 787-9 Dreamliners. United Airlines extended its TotalCare agreement to support its fleet of RB211-535 engines powering the Boeing 757.

CFM, ENGINE OF CHOICE

CFM International's industry-leading LEAP and CFM-56 product lines remain the engines of choice for single-aisle aircraft with the company signing orders, commitments and long-term service agreements for a total of 1,062 engines. During the week, EasyJet selected the LEAP-1A engine to power 100 Airbus A320neo family and the CFM-56-B engine to power 35 A320neo aircraft. The other wins included American Airlines opting for LEAP-1A engine to power 100 Airbus A320neo aircraft, Monarch Airlines to purchase LEAP-1B to power 30 Boeing 737 Max, Hainan Airlines selecting LEAP engines to power 50 Boeing 737 MAX airliners and InterJet selecting LEAP 1A to power 40 A320neos.

"What an incredible week," said Jean-Paul Ebanga, President and CEO of CFM International. "We started the show predicting that 2014 would be another record year. The prediction came true in a big way. As of today, we have total orders and commitments for more than 3,000 engines. And it is still only July. Both the LEAP and CFM-56 product lines continue to prove their worth to our airline customers around the globe and we are constantly gratified by the continued faith these airlines show in our people and our products. As always, our job is to continue to earn their trust, delivering the reliability and operating economics they expect from CFM."

PRATT & WHITNEY-IBM PARTNERSHIP

Pratt & Whitney, a United Technologies Corp company, has teamed with IBM to enhance the engine fleet management and health solutions. The arrangement will significantly broaden its current performance monitoring capabilities of more than 4,000 operational commercial engines. IBM will assist Pratt & Whitney in leveraging its world-class, military diagnostic, prognostic and health management capabilities to enable proactive and automated logistics to its rapidly expanding commercial fleet.

This will provide Pratt & Whitney customers with longer time on-wing, complement current asset maintenance alerts and deliver better insight into flight operational data."By incorporating learnings from our military engines programmes where we are pushing the envelope in terms of monitoring capabilities and teaming with IBM to integrate component and system health information, we will strengthen our commercial engine health analytics offering for customers," said Matthew Bromberg, President, Pratt & Whitney Aftermarket. There were many more announcements of varying dimensions, signalling the good times ahead for the aerospace industry. SP

CLEAN SKY - EUROPEAN MODEL TO EMULATE

CLEANER AND LESS NOISY environment is taking centre-stage amongst the aviation community in Europe and Clean Sky, a public-private partnership, is working as a catalyst. With air transportation expanding rapidly in Europe and elsewhere, the environmental concerns are growing. However, efforts are on to manage the environmental issues.

Clean Sky is entering its Phase II in its bid to achieve the 2020 goals of the Advisory Council for Aeronautics Research in Europe (ACARE). The goals set by ACARE are a 50 per cent reduction in fuel consumption and carbon dioxide emissions, an 80 per cent reduction in nitrous oxides emissions and 50 per cent reduction in external noise. These are ambitious targets, nevertheless these need to pursued relentlessly.

Clean Sky, in its bid to meet the ACARE goals, has been getting funds from companies, government entities etc. The European Commission provided 800 million Euro to develop cutting-edge technologies required to meet these goals. The EC figure was matched by financial and in-kind contribution from the 12 industry leaders and 65 associates that make up Clean Sky membership.

Speaking to *SP's Aviation*, Liliya Buyukliyska of Clean Sky said that between 2009 and 2014, 15 calls for proposals were issued and evaluated and now further calls for proposals have been issued and are currently under assessment. Over 650 projects have been launched so far with the average value of a topic being Euro 5,00,000.

She said that the Clean Sky programme could be replicated in other regions, but the initiative has to come from the region. Clean Sky's research work is divided among six different platforms called integrated technology demonstrators (ITDs), Smart Fixed Wing Aircraft (SFWA), Green Regional Aircraft (GRA), Green Rotorcraft (GRC), Sustainable and Green Engines (SAGE), System for Green Operations (SGO) and Ecodesign (ED). Over 20 demonstrators are being developed at a very high technological maturity level, she mentioned.

Some of the developments that are taking place encompass all segments of airline business, business jets, regional airlines, commercial airlines and helicopters. She gave the example of the 90-seater regional concept aircraft which features advanced technologies in almost all sub-systems, low weight structure, extensive use of electrical power in systems, advanced flight management systems etc. This next generation turboprop that is in the concept stage, could enter service in the period 2020 to 2025. SP

—By R. Chandrakanth

REDEFINED INTERIORS!
A MOCK-UP OF THE INTERIOR OF THE NEXT GENERATION OF E-JETS (THE E2S). THE PREMIUM CABIN LAYOUT IS EXCEPTIONAL FOR AN AIRCRAFT OF THIS SIZE.

EMBRAER SHOWCASES E2 JETS

Embraer is the leader in the 70- to 130-seat market with 52 per cent of the firm global orders

BRAZIL MAY HAVE DONE badly in World Cup football, but the country as a whole is showing a lot of verve (endorsed by the BRICS meeting). Showing lot more verve is the Brazilian aerospace behemoth – Embraer – which had a pretty good run at this edition of Farnborough, notching up aircraft orders and showcasing a cabin mock-up of its re-engined E2. Embraer has chalked out a clever strategy to garner substantial market share. It is downsizing its E-Jets family from four to three with the introduction of E2 Jets which are going to have larger windows and overhead bins, mood lighting and a staggered business class seat configuration. It will soon have a family of E2 jets consisting of the E175 E2, E190 E2 and the E195 E2. Embraer said it would freeze the design of E190 E2 by end-2014. The entry in service for the E190 E2 is 2018, for the E195 E2 is 2019 and for the E175 E2 is 2020.

The President and Chief Operating Officer (CEO) of Embraer Commercial Aviation, Paulo Cesar Silva, said Embraer had a much 'nicer story' than the Brazilian football team. Stating that Embraer jets were in operation with 86 airlines, showed its domination in 70- to 130-seat segment. "We are going to keep investing in the improvement of the existing programme. The E2 represents an effort of continuous innovation."

INVESTING TO STAY AHEAD

Luis Carlos Affonso, Embraer Commercial Aviation Senior Vice President of Operations and CEO, indicated the kind of improvements that were being made on the jets and how these would add enormous value for the customer. In 2013-14, the maintenance improvements had effected substantial benefits in terms of fuel burn. "The target for the E175 was five per cent reduction in fuel burn, but we achieved 6.4 per cent." Going into 2015, there would be further improvements in respect of interiors and on-board avionics. "Our strategy is different. We are not just thinking about re-engining, but also new wings and other features. Design

GROWING ORDER BOOK

- **Trans States Holdings of St Louis, USA – orders 100 E175-E2**
- **Deliveries for Trans States' 76-seat dual class E-175-E2s in 2020**
- **Fuji Dream Airlines of Japan orders six new E-Jets (three firm E175s and three options)**
- **Fuji Dream Airlines, if all options are confirmed, will have an all-EJet fleet of 14**
- **Brazil's Azul Linhas Aéreas signs a Letter of Intent (LOI) for up to 50 new E195-E2s.**
- **The LOI is for 30 firm orders with purchase rights for an additional 20.**
- **The LOI also makes Azul the launch customer for the E195-E2.**
- **The LOI is expected to be finalised in the fourth quarter of this year.**

PHOTOGRAPH: EMBRAER

AGGRESSIVE PLANS FOR CHINA, INDIA

In an interview with ***SP's Aviation*** at Farnborough, **John S. Slattery,** Chief Commercial Officer, Embraer Commercial Aviation, said that the Asian giants are going to be driving business in the years to come, riding on economic resurgence. In an interview with **R. Chandrakanth,** he talks about how Embraer is back in India with a bang.

SP's Aviation **(SP's): In the Embraer outlook, you have pointed out that China would have projected deliveries of 1020 units for 2014-33 and 520 units for Asia-Pacific. Are you banking heavily on China?**
John S. Slattery (Slattery): We are looking at all the emerging economies. No doubt, China is in the news and we are happy with the developments there. We have 80 per cent market share in China and we want to consolidate on that. The E-Jets fit perfectly into China's regional expansion plans.

SP's: What about India? Are you enthused with Air Costa operations and whether it will have an impact on prospective airlines?
Slattery: After Paramount Airways exited, Embraer did not have a presence in India. With Air Costa coming in and making an impact we are really excited about the regional aviation scene in India. I think it is going to get better for us. I keep visiting Vijayawada often and I am told that we can expect the regional aviation scene to get a boost with the new government expected to take quick decisions. We want to replicate in India what is happening in China, broadening the regional operator base. Interest in India is robust and we hope that it will get translated not just into aircraft but also better regional aviation facilities. The airline industry in India is taking note of the developments in Air Costa which has been having high load factors and is expanding its network. At the Singapore Airshow, it ordered 50 E-Jets E2 with options for 50 more.

SP's: What is the strategy for emerging markets?
Slattery: Not just the Indian passenger, but in different countries, we have found that the passengers are becoming more demanding, expecting a different level of airline experience. Embraer's aircraft which has no middle seat and has other notable features has enhanced the passenger experience. And we are enhancing the cabin features further.

SP's: Embraer is investing heavily in upgradation of aircraft. What is the rationale behind it?
Slattery: We are the market leaders and we want to consolidate the position. More importantly, we want to remain in the good books of operators by giving them the best of aircraft. Embraer, as you know, is the leader in the 70-130 seat market with 52 per cent of the firm global orders, followed by Bombardier at 25 per cent; Mitsubishi (MRJ) at seven per cent; Sukhoi at six per cent; Comac at six per cent and others at four per cent. Embraer has delivered 60 per cent of the regional jets across the world, followed by Bombardier at 31 per cent and the rest (nine per cent). The projected deliveries for 2014-33 are 6,250 units with China accounting for 17 per cent (1,020 regional aircraft) and Asia Pacific 520 aircraft (eight per cent). With the introduction of Embraer E-Jets E2, the regional aircraft market would see further buoyancy. SP

of new wings for both the E175 and the E190 were on."

Embraer, he reiterated, is making investments to the tune of $1.7 billion to ensure that the jets were way ahead of the market. "We are going to have an increased carry-on capacity, that is 40 per cent enhancement in volume." The carry-on volume has been increased by 40 per cent and will allow one carry-on (of the standard IATA size, 22 x 18 x 10 in) per passenger. Only 60 to 70 per cent can stow cabin baggage in the drop-down overhead bins of the current E-Jets. "We want to offer customers the best solution for their business model and the flexibility to quickly change cabin configuration without incurring high costs," added Luis Carlos Affonso.

NEW E2 CABIN MAKES ITS DEBUT

A completely redesigned cabin with unprecedented space and an innovative premium seating layout was on display at the Farnborough Airshow. UK design firm Priestmangoode was contracted to develop the interior jointly with Embraer. The new E2 cabin keeps the trademark two-by-two, 18.3 inch wide seats in economy class. The slim seats, which have no under seat support rails, give passengers more space to stow their cabin baggage or stretch out.

New overhead bins are about 40 per cent larger compared to the current-generation E-Jets. Space is so generous that each passenger on the aircraft can stow his/her own standard-size carry-on bag in the bins.

One of the signature design features of the E2 is an individual passenger service unit. Inspired by the automotive industry, each passenger has his/her own light and air vent that is positioned directly above the seat. Windows have been redesigned to make the cabin appear larger and brighter. SP

—By R. Chandrakanth

UNLOCKING REGIONAL POTENTIAL

MRJ believes that the regional aviation market is expected to flourish as several countries are 'unlocking' the potential of air transportation

MITSUBISHI AIRCRAFT CORPORATION WHICH manufactures the Mitsubishi Regional Jet (MRJ) was quite active during the Farnborough International Airshow, engaging not just the customers but the media too with constant updates on the delayed programme and market. On the opening day, it signed a memorandum of understanding (MoU) with Miami-based Eastern Air Lines Group for 20 firm orders for the MRJ-90 with purchase rights for an additional 20. It was an important win for MRJ which is keen on expanding its global footprint. Teruaki Kawai, President and COO, Mitsubishi Aircraft summed up the deal "This announcement encourages us to further boost our sales activity around the world."

It also signed an aircraft purchase agreement with Air Mandalay Limited (AML) for a firm order for six MRJ-90 with purchase rights for an additional four aircraft. Air Mandalay is a Myanmar-based airline, currently operating three regional turboprops and seeking to expand its fleet capabilities with introduction of regional jets. Till date, 325 MRJ are on order, including 25 (15 firm, 10 option) from All Nippon Airways Co, Ltd, 100 (50 firm, 50 option) from Trans States Holdings, Inc and 200 (100 firm, 100 option) from SkyWest, Inc. MRJ is a family of 70- to 90-seat next-generation aircraft equipped with Pratt & Whitney's revolutionary PurePower engine and state-of-the-art aerodynamics to significantly reduce fuel consumption, noise and emissions, while offering top-class operational benefits, an outstanding cabin designed for heightened passenger flying comfort and large overhead bins.

In an interview with *SP's Aviation* at Farnborough, the Executive Vice President (Sales and Marketing) Masao Yamagami opined that the regional aviation market would flourish as several countries were 'unlocking' the potential of air transportation.

PHOTOGRAPH: MITSUBISHI AIRCRAFT CORPORATION

***SP's Aviation* (SP's): Congratulations on the orders at Farnborough, while one is from the US the other is from Asia, which market is showing promise?**
Masao Yamagami (Yamagami): We are not looking at any one particular market as we need to have a global footprint. However, being in the Asian region, we expect the Asian market to prop up our sales in the near future. The reason is all evident – Asian economies are likely to grow faster than any others in the years ahead. Presently, in Asia, narrow-body aircraft dominate the scene. However, with the opening up of the skies, point-to-point travel will considerably expand and consequently the demand for regional aircraft will grow. This development is likely to happen in the next four to five years and MRJ is perfectly placed to cash in on such a scenario.

SP's: Is India on the radar of MRJ's global strategy?
Yamagami: Certainly. No aircraft manufacturer can ignore India. It is a huge market and we are keen to serve the market at the earliest. We have been talking to all the airlines in India, but you know what the situation with airlines in India is (referring to bleeding of airlines). We have approached all of them – SpiceJet, IndiGo, GoAir, Air India, Jet Airways. All of them appreciate the capabilities of the MRJ, but have not yet taken decisions on their regional aviation plans.

SP's: What are the factors hindering MRJ in India?
Yamagami: There are several factors affecting the growth of airlines in India and they include high taxation, inadequate infrastructure, etc. As for OEMs, the problem is not just for MRJ of entering the market here, it is for all. I am sure there is now greater understanding in India of how regional aviation can play a decisive role in economic growth.

SP's: MRJ is plagued by delays, what is the update?
Yamagami: Yes, we have revised the schedule, but we are now on track. Only last month, the PurePower PW1200G engines have been mounted on the MRJ first flight test aircraft. This engine mount is a significant milestone. The first flight as we have already announced is slated for second quarter of 2015 and the first delivery to second quarter of 2017. SP

—By R. Chandrakanth

ROLLS-ROYCE EMPLOYEES SIGHTING A350 XWB DURING FARNBOROUGH

TRENT XWB A DERBY WINNER

The Trent XWB, specifically designed for the A350 XWB, is the fastest-selling Trent engine ever, with more than 1,400 already sold

BY R. CHANDRAKANTH
REPORTING FROM DERBY, UK

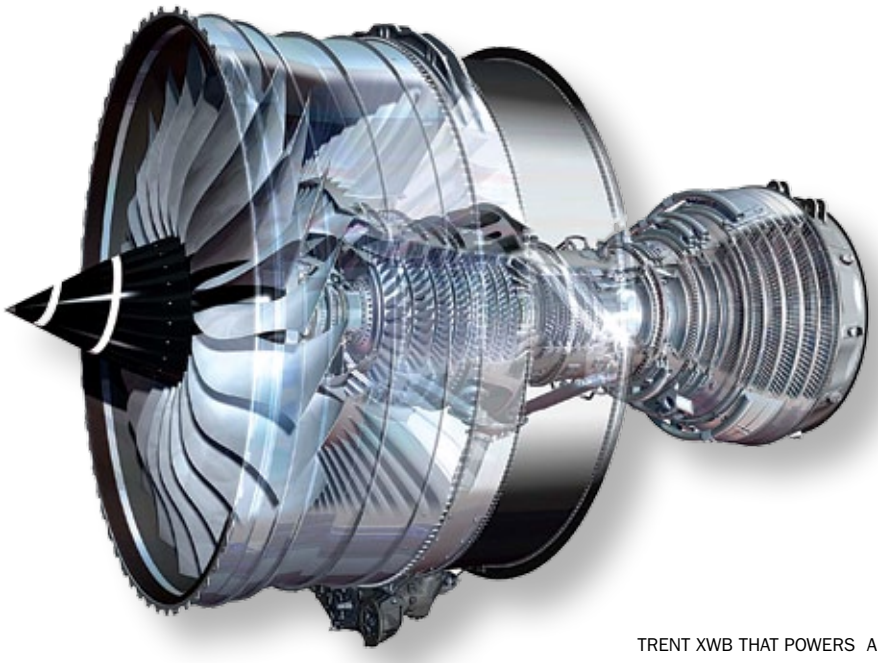
PHOTOGRAPH: R. CHANDRAKANTH / SP GUIDE PUBNS

AT THE ROLLS-ROYCE FACILITY in Derby, away from Farnborough's hectic airshow schedule, it was heart-warming to see all the Rolls-Royce employees stop work, come out in the open and cheer the Airbus A350 XWB which flew past the facility at 3:35 pm. It was for the first time that they were witnessing their work in action. It was their Trent XWB engine that was powering the A350 XWB for launch customer Qatar Airways. One could feel the sense of satisfaction.

Once the flypast was over, they were back to their stations, focusing on the work on hand – to come up with the best engines that are unmatched in terms of fuel burn, reduced noise levels and enhanced performance. The advancements in technologies have helped Rolls-Royce produce the Trent XWB said to be the world's most efficient aero engine. The Trent XWB has been designed exclusively for the Airbus A350 XWB family.

Prior to the airshow on July 11, Rolls-Royce successfully ran the 97,000 lb thrust version of the engine which will power the A350-1000. The company also celebrated the first run of the Trent 1000-TEN which incorporates Trent XWB technology and is capable of powering all versions of the Boeing 787.

Rolls-Royce is investing heavily in research to maintain its leadership position in advanced engine technologies such as:



TRENT XWB THAT POWERS AIRBUS A350 XWB

- High efficiency compressors and turbines with fifth-generation 3D aerodynamics.
- Advanced lean burn, low emission combustors
- Advanced light-weight, heat resistant materials such as ceramic matrix composites (CMC) which allow the engine to operate at temperatures equivalent to half the temperature of the surface of the sun, while maintaining component lives.

Earlier this year Rolls-Royce announced not one but two new engine designs. Ths first is "Advance" which offers some 20 per cent better fuel burn than the first Trent engines and the second "UltraFan", a geared design that could be ready in 2025. There would be at least 25 per cent improvement in fuel burn and emissions. Rolls-Royce also deploys, where beneficial, new technologies to in-service engine programmes.

Giving a perspective of engine developments, Iain Dudley, Product Marketing Manager, Rolls-Royce said that in 1995 when Trent 700 entered into service the price of aviation turbine fuel was $0.6 per gallon and now it has shot up to $3 per gallon. Simply put, it meant that fuel prices would keep going up and it was for the engines to optimally perform to offset rising fuel costs. A tall order indeed, but engine manufacturers are seized of the matter and considerable development is taking place. Rolls-Royce has seven engines in its Trent family – the XWB, 1000, 700, 7000, 800, 900, and 500. It is the engine of choice for this generation and the next, powering about 50 per cent of the next-generation wide-body aircraft. The projected deliveries are 4,000 up to 2023 as against the 1,600 delivered in the last decade. The Trent XWB has over 700 firm orders with 39 customers and some of them include Etihad Airways, Qatar Airways, Thai Airways, Air France KLM, Singapore Airlines, Azul, Japan Airlines, Sri Lankan Airlines, etc.

This is the outcome of painstaking effort of the engineers at Rolls-Royce. The Trent XWB has undergone four years of testing across the globe, starting with Derby; Glacier, Manitoba; Edwards Air Force Base, California; Stennis, Mississippi; INTA, Madrid; and Dahlewitz. Till date, it has completed over 7,116 hours of testing. The climatic engine tests have been successfully completed at Eglin Air Force Base, Florida at +45 and -40 degrees centigrade and -40 degrees. The hot weather tests have been carried out at Al Ain in the United Arab Emirates.

Describing features of the Trent XWB engine, he said that it had high flow fan system enabled with inflected annulus; larger core to increase flow; increased mechanical capability for 97,000 lbs thrust; maintain nacelle aerolines as 84k engine and high capability turbines. The fan and the core have been optimised for 97,000 lbs thrust. The design and technology enablers are increased flow fan system; impingement effusion combustor; adaptive cooling system; advanced tip cooling; shroudless blade system; high temperature materials and coatings.

The Trent 1000 is designed and optimised for the Boeing 787 family. It has been selected by about half of 787 customers. Trent 1000 offers the best lifetime fuel burn performance. It is fitted on the Boeing 787-9 Dreamliner. The Trent 1000 is on 51 aircraft with six operators and one lessor.

The Trent 700, in its 19 years of service so far, is on 605 aircraft, the largest in-service fleet of RB211 and Trent engines. It has completed 28 million flying hours with a dispatch reliability of 99.9 per cent. The Trent 700 Regional is perfectly matched to the A330 Regional. The features are optimised thrust, reduced maintenance cost, interchangeable and is easily upgraded and it is the best value on A330. The evolution to the Trent 7000 has its foundations in the experience of Trent 700, the architecture of the Trent 1000-TEN and the technology of the XWB. The Trent 7000 matches the A330neo. From the Trent 700, the 7000 has double the bypass ratio, 10 per cent better SFC and 10 db less half the noise.

The Trent 900 which entered service in 2007 is on 67 aircraft and has clocked 3.27 million flying hours with again a dispatch reliability of 99.9 per cent. It is an engine of choice with British Airways, Qantas, Singapore Airlines, Lufthansa, Virgin Atlantic, China Southern, Thai, Asiana Airlines, VIP and Skymark, with deliveries for the last two this year. It is the engine of choice on the A380. SP

PHOTOGRAPH: ROLLS-ROYCE

AUSTRALIAN QANTASLINK'S Q400 BY BOMBARDIER

KEY APAC PLAYERS

By 2030, two-thirds of the global middle class will be in the Asia-Pacific region which opens up enormous opportunity for regional air travel

BY R. CHANDRAKANTH

ASIA-PACIFIC IS A HIGH-GROWTH region. Ernst & Young has reported in a survey that this region will have 1.7 billion people who qualify as middle class by 2020 and that this figure is expected to touch 3.2 billion by 2030. That means the region will have two-thirds of the global middle class. It also means that the air travel potential of the growing middle class is enormous.

Another interesting fact that is music to the ears of airlines is that there is large-scale migration from smaller cities to larger cities. The air connectivity for such traffic movement has to be regional and hence some of the Asian countries have begun networking the hinterland with smaller airports. Those who have taken an early lead are likely to emerge winners. The key regional airline players in Asia-Pacific are few, but the landscape is soon going to change as there are a number of them entering the fray. Australia which has a fairly large geographical spread, has fairly networked different locations with competitive regional airlines.

PHOTOGRAPH: BOMBARDIER

AIR COSTA, INDIAN REGIONAL SAGA

Air Costa, an Indian regional airline based in Vijayawada, commenced operations in October 2013 with two Embraer E-170 aircraft leased from ECC.

The airline plans to focus on improving connectivity between Tier-II and Tier-III cities in India and has announced an investment of $150 million by 2015. The airline plans to set up a maintenance, repair and overhaul (MRO) facility at Vijayawada by 2015. It currently has a maintenance centre at the Chennai International Airport.

Air Costa received two more Embraer E-170 jets, one in December 2013 and the other in January 2014. It aims to have

INDIA'S AIR COSTA'S E-170

ten E-170s and E-190s by the end of 2014 and a total of 25 aircraft by 2018.

At the Singapore Airshow, Air Costa ordered 50 E-Jets E2 aircraft with option for another 50 from Brazilian manufacturer Embraer, a deal worth $2.94 billion. Air Costa will become the first customer in India of the E-Jet E2 with the first delivery in 2019.

Air Costa flies to nine destinations in India connecting metros to Tier-II cities. The cities it connects include Ahmedabad, Bengaluru, Chennai, Coimbatore, Hyderabad, Jaipur, Vijayawada, Madurai and Visakhapatnam.

REGIONAL EXPRESS, AUSTRALIA, TOPS THE CHARTS

'Our heart is in the country'. That is the tagline and essence of Regional Express, the largest regional airline from Australia and in the region. It has a fleet of 95 aircraft, 51 of them being Saab 340, followed by 16 Piper Warrior, seven Westwind 1124 and other aircraft including a Brasilia 120 for exclusive freighter service. Regional Express is popularly known as Rex.

After Ansett collapsed, a group of Australian businessmen saw an opportunity in reviving only the regional aviation part of the business. They believed there were sound business reasons for this initiative. Both Hazelton and Kendell, before they were part of Ansett, were profitable entities and enjoyed excellent reputation and support. Both airlines were still in operation under their own brands, the route networks of both operators were complementary and they operated the same types of aircraft.

Rex has its roots firmly in the bush and in country Australia. Rex believes that the bush needs and deserves an air service of quality that provides good connectivity with capital cities at affordable prices. Rex seeks to fulfil these expectations. Since its formation, Rex has steered a course balancing the needs of regional communities for extensive and affordable air services and to be economically viable and sustainable.

QANTASLINK, LINKING AUSTRALIA

QantasLink from Qantas operate flights to over 56 metropolitan and regional destinations across Australia and Papua New Guinea, including some of the region's hottest ski, beach and bush destinations. Formerly Airlink, Eastern Australia Airlines and Sunstate Airlines, QantasLink is now Australia's largest regional airline, operating over 2,000 flights each week.

It also operates flights to destinations throughout regional Western Australia through charter service provider, Network Aviation. QantasLink is located at Qantas Terminal 3 in Sydney. QantasLink customers travelling to and from Sydney enjoy exclusive world-class facilities following an upgrade that involved the regional airline moving into the Qantas Domestic Terminal, Terminal 3.

VIRGIN AUSTRALIA REGIONAL

Virgin Australia Regional Airlines (formerly Skywest) is an Australian regional airline based in Perth, Western Australia. It services key towns in the state of Western Australia as well as interstate destinations Darwin, Melbourne, Brisbane, Canberra and Sydney. It also serves regional destinations in New South Wales and Queensland and operates charter flights to Bali. In April 2013 Skywest was purchased by Virgin Australia Holdings as its new regional offshoot and renamed Virgin Australia Regional Airlines.

Virgin Australia Regional was formed in 1963 as Carnarvon Air Taxis flying charter flights with small general aviation aircraft out of Carnarvon, Western Australia. In 1979 it changed its name to Skywest Aviation and moved to Perth's Jandakot Airport. In 1980 Skywest Airlines was formed at Perth Airport and acquired Stillwell Airlines and its routes. The combined fleet included 39 aircraft, making it the second largest commuter airline in Australia at the time. The Skywest Airlines/Aviation fleet included a mix of general aviation types and small airliners including GAF N-24 Nomad, Embraer EMB-110 Bandeirante, Beechcraft King Air 200 & Fairchild SA-227 Metro-III as well as smaller types such as Cessna 182 and Piper Aztec. As of March 2014, the Virgin Australia Regional fleet consisted of 34 aircraft, 19 Fokker 50 and 100, 13 ATR-72 and two Airbus A320.

PHOTOGRAPH: EMBRAER

ATR 72-600 OF MASWINGS, MALAYSIA

PHOTOGRAPH: ATR

TIANJIN AIRLINES, NETWORKING CHINA

Formerly Grand China Express Air, Tianjin is a regional airline headquartered at Tianjin Binhai International Airport passenger terminal building, Dongli District, Tianjin, in China operating domestic scheduled passenger and cargo flights out of Tianjin Binhai International Airport.

The airline was established in 2004 in an effort to merge the major aviation assets of Hainan Airlines, China Xinhua Airlines, Chang'an Airlines and Shanxi Airlines and received its operating licence from the Civil Aviation Administration of China in 2007. Scheduled flights were launched under the brand name Grand China Express Air, using 29 to 32 seat Dornier 328-300 jets. At that time, the company was China's largest regional airline, operating on 78 routes linking 54 cities. On June 10, 2009, the company's name was changed to Tianjin Airlines.

As of August 2011, 63 destinations were connected (excluding those operated on behalf of Hainan Airlines), though by 2012, the airline was flying on more than 450 routes linking at least 90 cities, taking more than 90 per cent of the domestic regional aviation market.

Tianjin Airlines fleet consists of 85 aircraft with an average age of 4.1 years that includes 12 Airbus A320, 23 Embraer ERJ-145,and 50 Embraer 190. Additionally, Tianjin Airlines operates 11 Dornier 328 aircraft which are owned by Hainan Airlines.

JUNEYAO AIRLINES

Juneyao is a regional airline based in Changning district, Shanghai, China, operating domestic services out of the two Shanghai airports Hongqiao and Pudong. The company was founded in 2005 as a subsidiary of Juneyao Group. As of August 2014, the Juneyao Airlines fleet consists of 36 aircraft with an average age of 3.1 years. It has 32 Airbus A320-200 and four Airbus A321-200.

SILKAIR, SPREADING WINGS

SilkAir, the regional wing of Singapore Airlines, flies one of the youngest fleets in the Asian region, with an average age of seven years. It currently operates 26 aircraft, 16 Airbus A320-200, six Airbus A319-100 and four Boeing B737-800 aircraft.

It is a wholly owned subsidiary of Singapore Airlines and operates scheduled passenger services from Singapore to 44 cities in Southeast Asia, the Indian Subcontinent, China and Australia. As the regional wing of Singapore Airlines, it serves the short-haul destinations in the Singapore Airlines Group network. In the year to March 31, 2013, the airline flew 3.3 million passengers and made an operating profit of Singapore $96.7 million.

ANA WINGS SPREADING ACROSS JAPAN

ANA WINGS is an airline of ANA group based at Tokyo International Airport (Haneda) in Õta, Tokyo. The airline was formed on October 1, 2010. As of March 2014, the ANA Wings fleet consists of 36 aircraft with an average age of 11.8 years. ANA Wings has 16 Boeing 737-500 and 20 Bombardier Dash-8 Q-400. It operates to major provinces such as Kanto, Chubu, Kansai, Chugoku, Tohoku, etc.

MASWINGS, MALAYSIA'S FIRST COMMUTER AIRLINE

MASwings, Malaysia's first commuter airline was officially launched on October 1, 2007. It caters to the air travel needs of Sarawak and Sabah's travelling population by providing affordable fares, convenient schedule and connections within the two states in the Malaysian Borneo.

Being a subsidiary of Malaysia Airlines, MASwings takes advantage of its link with Malaysia's national carrier to provide Sabah and Sarawak with greater connectivity to the global network already serviced by Malaysia Airlines. MASwings is governed by direction and policies set by the government in providing rural air services within Sabah and Sarawak. MASwings provides two types of aircraft for passenger charters, ATR 72-500 and ATR 72-600 and DHC-6-400 Vikings.

There are other regional players who provide exceptional connections to and from within their countries, a trend that is growing significantly. SP

WAITING IN THE WINGS

The government has cleared six proposals for starting airline operations, it needs to be seen how many will really takeoff

BY R. CHANDRAKANTH

THE NEWLY ELECTED GOVERNMENT in its first month in office has issued 'no objection certificate' (NOC) to two companies to establish regional airlines, one is Air Carnival based in South India and the other is Zav Airways which will cater to the East and North-Eastern regions. The approvals, according to the Minister of State for Civil Aviation, G.M. Siddeshwara was accorded on June 24 and 30, respectively.

Air Carnival Charter Service was established in 2013 and is based in New Delhi. It is founded by S.I. Nathan who runs the Air Carnival Aviation Academy in Coimbatore and Chennai. As per the website of Air Carnival, it is going to provide cost-effective and reliable charter services as of now. Air Carnival is now all set to start a regional airline.

The other NOC is for Zav Air which is gearing up to provide inexpensive personal helicopter flights or air taxi services. The Zav Air website does not mention anything about regional airlines, but states that it will initially network North-Eastern region and the Eastern region. Headed by Kishore Zavery, Zav Airways aims to provide cheaper private air travel. It says it has been flying customers in helicopters from Aizwal to Dwaraka and Leh to Kanyakumari.

PHOTOGRAPH: WIKIPEDIA

2010 PROPOSALS BACK

ZAV AIRWAYS. In 2010, it had submitted proposals to start a regional carrier, planning operations in the East and North-East, with two Bombardier 80-seater and 70-seater planes. It is hoped that this time round, Zav will take to the skies.

The Ministry of Civil Aviation has also issued NOCs to AirOne Aviation, Premier Air, Turbo Megha and Zexus Air Ltd.

AIRONE AVIATION. Promoted by the former President of

Air Sahara, Alok Sharma. The company currently offers charter services to domestic and international destinations. It holds an operating permit for charter operations and as per the airline website, it was to have ten aircraft by the end of 2013 of which three are helicopters. The airline service primarily operates out of Delhi, Mumbai and Lucknow.

ZEXUS AIR. It is a Delhi-based company and according to reports it has applied for an air operator certificate with the Directorate General of Civil Aviation (DGCA) and intends to add four Embraer jets as per its application with DGCA. The aircraft were previously with Brazilian regional operator TRIP Linhas Aereas. No other details of Zexus Air is available.

PREMIER AIR. Reportedly promoted by non-resident Indian Umapathy Pinaghapani, the the airline is based out of Bengaluru and it was to launch a regional airline in the name of Air Dravida. There is no sign of any such development.

TURBO MEGHA. Headquartered in Hyderabad, the charter airline service has two active partners Ram Charan Tej Konidala and Vankayalapati Umesh. Set up in 2003, it initially provided ground handling services to airlines before diversifying into charter operations. The airline service has one helicopter and two small jets for charter operations from Hyderabad.

It remains to be seen as to which of these manage to commence operations, considering what happened earlier. It may be recalled that in 2010, the government approved half a dozen new regional airlines which included Star Aviation, Zav Airways, King Airways, Sky King Aviation, Premier Airways and a cargo carrier. It was touted that the Chennai-based Star Aviation, promoted by Dubai-based real estate company ETA Star, is likely to be the first to fly with three Embraer aircraft. There is no news after that.

REGIONAL CONNECTIVITY EXPANSION

India's civil aviation regulator is likely to make it easier for companies to start flight operations, especially those seeking to use small planes. It's also recommended that small operators be allowed to run scheduled services to boost connectivity of destinations that aren't served by airlines. Approval by the Ministry of Civil Aviation (MoCA), comes in the wake of a progressive thinking on the part of the new government. It has overturned the policy of selectively granting aviation licences to applicants. This year, we have seen Tata Sons low-cost joint venture with AirAsia Bhd takeoff and the expected launch of the Tata-Singapore Airlines joint venture. All these moves are likely to stoke competition, leading to lower fares for consumers and importantly enhanced connectivity across the country.

Data by the Centre for Asia Pacific Aviation for 2012 indicate per capita domestic airline seats is very low in India, just 0.07, compared with 3.35 for Australia, 2.49 for the US, 1.38 for Canada and 1.05 for Japan. With the number of domestic air passengers in the country projected to triple to about 175 million annually by 2021 from 58 million in 2012, start-up airlines from AirAsia India to Tata-SIA have announced new ventures to tap in on the growth in the market.

It is now for these applicants who have got the NOC to approach the DGCA for an airline licence, a process that reportedly takes about three months. The scope for new airlines entering the market is good as indicated by the consulting firm, Centre for Asia Pacific Aviation (CAPA) which has pegged the growth of domestic airline around eight to ten per cent.

MEASURES TO PROP AVIATION SECTOR

The Narendra Modi Government has announced a slew of proposals to boost the aviation sector and wants to fast-track airport infrastructure development, boost regional connectivity and enhance competition among existing airlines. The previous government had come out with a policy on enhancing regional air connectivity and the new government is adding to the destinations.

The Minister of State for Civil Aviation Siddeshwara has said that the ministry had identified 50 locations in various states with potential for small airports. The question is how will the state governments contribute to airport development which in turn will have positive impact on the state's revenues. No-frills airports which cost just ₹70- ₹80 crore will be constructed in areas which fall in the tourism circuit or backward areas where connectivity needs to be boosted.

The only regional airline which has succeeded in recent times is Air Costa which operates four aircraft with 34 flights across nine cities mainly in South India. It connects Bengaluru, Hyderabad and Chennai with smaller cities such as Jaipur, Madurai, Vijayawada, etc by using two Embraer aircraft types — a 67-seater E-170 and a 112-seater E-190.

THE MINISTRY OF CIVIL AVIATION HAD IDENTIFIED 50 LOCATIONS IN VARIOUS STATES WITH POTENTIAL FOR SMALL AIRPORTS.

Air Costa CEO, Ramesh Lingamaneni said that the airline has succeeded because of its judicious approach to new routes, fleet size and the fact that it chose these two aircraft after evaluating routes and demand potential. In three of the last six months, Air Costa has seen 100 per cent on-time performance and its aircraft occupancy in June was 82 per cent, among the highest.

Amber Dubey, partner and India head of aerospace and defence at global consultancy KPMG, has said, "It is a great development. KPMG believes that the next phase of growth of Indian carriers will come from no-frills airports (NFA) and regional carriers. This will prevent large national carriers from wasting fuel on half empty planes on regional routes just to meet DGCA's Route Dispersal Guidelines norms. For this, MoCA should allow seat trading and code shares between national and regional carriers."

The government hopes that the granting of NOCs and Air Operator's Permit to new operators would fast-track its intention to fly to destinations not currently served by existing operators.

In March this year, the Ministry announced the policy on regional and remote area air connectivity. The following concessions will be provided to passenger or cargo aircraft which operate to underserved airports for an initial period of three years:

- Exemption from landing and parking charges, RNFC charges, fuel through-put charges and any other charges levied by AAI.
- Airlines/operators will be allowed to manage their ground handling at airports.
- Ministry of Defence would be requested to give similiar concessions under their control. The Ministry has identified 45 small airports where the concessions will be applicable.

The aim of the policy is to encourage airlines and other operators to operate to such airports where infrastructure has been made available by offering certain incentives and thereby reducing viability gap, if any for such operations. We need to see who all take the bite. SP

STANDARDISING OPERATIONS

AIR CMDE A.M.GANAPATHY (RETD)

The Government is mulling adoption of the International Standard for Business Aircraft Operations

PHOTOGRAPH: SP GUIDE PUBNS

At a recent meeting which Civil Aviation Secretary Ashok Lavasa and other top officials had with Business Aircraft Operators Association (BAOA), in a bid to make general aviation viable, government has decided to review various rules governing air charters and non-scheduled operations and take steps to improve infrastructure and other facilities keeping their interests in mind. In the meeting, BAOA also sought a separate safety management system (SMS) for general aviation, different from the ones for scheduled airlines, as was a worldwide practice, adding the operators suggested that the global International Standard for Business Aircraft Operations (IS-BAO) should be adhered to.

AT A RECENT MEETING the Civil Aviation Ministry led by its Secretary Ashok Lavasa had with the Business Aircraft Operators Association (BAOA), it was decided to review various rules governing air charters and non-scheduled operations and take steps to improve infrastructure and other facilities, to make general aviation viable business. The BAOA among other things sought a separate safety management system (SMS) for general aviation, different from the ones for scheduled airlines, as is the worldwide practice. One of the suggestions was introduction of International Standard for Business Aircraft Operations (IS-BAO).

The Civil Aviation Secretary assured that adoption of IS-BAO as a means to comply with International Civil Aviation Organisation (ICAO) SMS requirements was under consideration for general aviation and business aviation (GA/BA) operators.

Realising the shortcomings relating to the subject of safety standards and standardisation affecting GA/BA operators, the BAOA in May 2012 constituted a Standards Committee to review and recommend changes and subsequently these were discussed with the regulatory authorities.

IS-BAO IS GOLD STANDARD

The IS-BAO, as a safety standard, is rapidly gaining acceptance globally by civil aviation regulators. It is considered the Gold Standard in Safety. The standard is well known in developed aviation markets such as the US, Canada, Europe, Australia, etc. Over 700 aircraft operators globally are certified to the IS-BAO, under a registration/certification process overseen by the IBAC (International Business Aviation Council), whose office is co-located with the ICAO in Montreal, Canada.

The SMS is the cornerstone of the IS-BAO programme and includes ICAO Annex 6 Part II mandated SMS SARPS (Standards & Recommended Practices). The IS-BAO is based on ICAO SMS Framework & ISO Quality Systems. The IS-BAO combines the principles of SMS with international best practices (ICAO SARPS), all contained in a generic company operations manual (COM) that can be tailored to fit the specific size of GA/BA aircraft operators.

In India, the IS-BAO has been implemented by Punj Llyod Pte Ltd which has recently been certified/registered by the IBAC. Two other Indian NSOP operators are considering implementation of the IS-BAO.

SAFETY CULTURE

The travelling public is increasingly concerned about the safety of Indian skies. The many GA accidents (especially helicopters) and the airline crash at Mangalore involving the loss of many lives are clear indicators of the indifferent safety culture of Indian aviation. It is well established that safety and standards are two sides of the same coin. Hence, the statement of the aviation secretary to consider the IS-BAO as a standard is not only timely, but welcome. It indicates a refreshing change of government willingness to collaborate with the GA/BA industry experts, after a hiatus of decades!

Aviation safety culture needs to be seen in the Indian context. There is strong evidence that the transportation industry as a whole suffers from a poor safety record. Indian roads have a horrific safety record and it's no different with Indian railways. A cursory study of other industries indicates a similar state of affairs. Whether it is the Upahaar cinema fire, the USFDA warning to the MD of Ranbaxy Labs in 2008 or even the Indian military, the overall safety culture in India, is well below internationally benchmarked best practices.

As a result of the Ranbaxy case, the pharma industry finally realised that "non-compliance is more expensive than compliance". Not too different from the experience of our GA/BA industry post the downgrade it would appear!

Seen in the above context, deductive logic would seem to indicate that our aviation safety culture has a long way to go, before the confidence of the travelling public can be restored. A collaborative approach between the regulator and the industry is necessary, if safety deficiencies are to be addressed. This requires "change management" to be effected at the highest level of management, within both the stakeholders.

The repeated downgrade of the civil aviation regulatory authorities by ICAO and FAA, are clear indicators of the safety health of civil aviation in India. Often, foreign countries have denied entry of Indian GA/BA aircraft, till such time as proof of acceptable standards are provided by the operator. Unless a positive safety culture is established, future downgrades could continue to occur. The USAOP (Universal Safety Audit Oversight Programme), instituted by ICAO, has been framed for just such purpose. It is up to the regulator and the industry to prevent such action by benchmarking to international best practices.

It is in the above context, that the benefits of our GA/BA operators benchmarking standards to the IS-BAO becomes relevant, as a confidence building measure to international civil aviation authorities. A high safety standard is always good for business! SP

The author is an SMS instructor and IS-BAO auditor based in Bengaluru. He is a Managing Partner of CBAS Pvt Ltd that conducts aviation safety audits and MITRE-based SMS training. The views expressed are those of the author.

FLIGHT MH-17: VICTIM OF AERIAL TERRORISM?

The downing of MH-17 is undoubtedly an outrageous act of terrorism

BY AIR MARSHAL B.K. PANDEY (RETD)

WHILE THE MYSTERIOUS DISAPPEARANCE on March 8, 2014, of Malaysian Airlines flight MH-370 with 239 souls on board flying from Kuala Lumpur to Beijing, continues to haunt the airline, it suffered another debilitating blow when on July 17, 2014, flight MH-17, another Boeing 777 that was cruising along the international airway at 33,000 feet, fell out of the sky. The wreckage of this Malaysian Airlines flight that was en route from Amsterdam to Kuala Lumpur, was found in a field in Eastern Ukraine, 80 kilometres short of the Russian border in the territory held by the pro-Russia Ukrainian rebels who have been battling forces of their government.

The immediate reaction from various quarters was that the airliner was shot down most probably by a surface-to-air missile. This however, is only a preliminary assessment and the actual cause of the disaster can only be ascertained through an impartial international investigation. Given the situation of conflict in the region, this will be a difficult proposition as access to the wreckage will not be easy.

In the meantime, all 298 innocents on board from nine different nations, perished in the crash. Absence of distress call from the MH-17 indicates that the destruction of the aircraft was sudden, possibly an in-flight explosion leading to disintegration.

Since February this year, a battle has been raging between the pro-Russia rebels in the Donetsk region of Eastern Ukraine and the forces of the Government of Ukraine. The rebels have established control of a sizeable area in Eastern Ukraine and have declared the formation of Donetsk People's Republic. Even though, the area has become a battle zone with frequent aerial action, no restriction had been placed for international civil air traffic by the regulatory authorities.

ILLUSTRATION: ANOOP KAMATH

WHAT COULD HAVE GONE WRONG

There are as many explanations for the disaster as the number of parties involved and the hypotheses offered by the parties concerned are mutually conflicting. The Ukrainian Government holds the Russian-backed separatists engaged in conflict in Eastern Ukraine responsible for the disaster. The separatists on the other hand, are blaming the Ukrainian Government. And of course, the Ukrainian Government along with their Western supporters would like to pin Russia down for the tragedy alleging complicity with the Ukrainian rebels. Apart from the tragic loss of lives, this sordid episode is only fuelling the tension between the US and Russia with the two superpowers hurling accusations at each other for the disaster and slapping sanctions.

THE RUSSIAN PERSPECTIVE

Russia believes that the probability that the MH-17 was shot down by the Ukrainian armed forces, is high especially as they have a track record of similar misdemeanour. In October 2001, Ukraine shot down a Russian civilian aircraft over the Black Sea during a military exercise. The Ministry of Defence (MoD) of the Russian Federation says it has evidence that when in the proximity of Donetsk, flight MH-17 deviated by 14 km towards the North from the air corridor. It then flew back into the air corridor and disappeared from the radar screen at 17:23 Moscow time. The reason for the deviation can be ascertained only after analysis of data obtained from the black box.

As per the Russian MoD, several units of the Buk-M1 missile system had been deployed in the vicinity of Donetsk by the Ukrainian

armed forces. This weapon system is capable of engaging aerial targets up to a range of 35 km and altitudes up to 22 km. The Russian MoD is of the view that as the Ukranian rebels do not possess combat aircraft, the Buk-M1 air defence system was deployed by the Ukrainian armed forces in the vicinity of Donetsk obviously against a perceived threat from the Russian Air Force. Also, Russia claims it has not delivered any Buk-M1 missiles systems to the Ukrainian rebels.

As per the Russian MoD, both the impact point and the airway lie within the air defence zone of the Buk-M1 missile system deployed by the Ukrainian armed forces. This is suggestive of their role in the disaster. Their suspicion is strengthened by the fact that on July 17, Russian intelligence detected increased activity of Ukrainian radars of the Buk missile system. At that time there were three civilian aircraft transiting the area namely a flight from Copenhagen to Singapore at 1717 hours, flight from Paris to Taipei at 1724 hours and the ill-fated flight from Amsterdam to Kuala Lumpur. All the three aircraft were being tracked by the air traffic control radars of the Russian MoD.

The Russian air traffic control also detected a Ukrainian Air Force aircraft, believed to be a Su-25, climbing towards flight MH-17 and was observed to be between three to five km from it. The Su-25 carries the R-60 air-to-air missile which can lock-on to a target at a distance of 12 kilometres and destroy it at a range of five km. The Russian MoD would like to know what the fully armed Su-25 was doing in an international airway at the altitude at which civil airliners were operating.

At 1720 hours, when flight MH-17 was 51 km from the Russian border on a bearing of 300 degrees, the Russian air traffic control radar observed that the Boeing 777 began to lose speed and by 17:21:35 hours, it was down to 200 kmph. The ill-fated airliner was last observed to be over the area where the wreckage was found later. There is thus a possibility that MH-17 was shot down by the Ukrainian Su-25.

Another theory advanced by Russia is that this was a deliberate attempt by Ukraine to shoot down the Russian presidential plane carrying Vladimir Putin returning from the BRICS Summit and put the blame on the Ukrainian rebels. Putin's aircraft was to fly along the same international airway at about the same time as the MH-17. However, for some reason, it deliberately changed its route of which the Ukraine military was not aware. Hence it mistook MH-17 for the Russian presidential plane and brought it down as plannned.

UKRANIAN RESPONSE

Kiev claims that it has proof to show that the missile that brought down MH-17 was fired by the pro-Russia rebels who have been supplied with this weapon system by Russia. This was stated in a press conference by Andrey Lysenko, spokesman for Ukraine's Security Council. This position was reiterated by Petro Poroshenko, President of Ukraine who said, "We have strong evidence of the cause of the MH-17 crash. We know exactly the place from where the surface-to-air missile was launched. the place where it hit the civilian plane and where it crashed. We are ready to provide evidence to the international investigation commission". Ukraine has also claimed that it has compelling evidence that a Russian crew operated the missile system that brought down MH-17 and accused Moscow of helping rebels in destroying the evidence.

ROLE OF PRO-RUSSIA REBELS

The Ukraine government has released intercepts of a conversation claimed to be between the rebels and a Russian that suggests that the former mistook the ill-fated plane for a military transport aircraft. Igor Strelkov, self-proclaimed Defence Minister of the Donetsk People's Republic, also one of the most brutal pro-Russia leaders in the insurgency and is a retired Colonel from Russian military intelligence, had tweeted that they had shot down the Malaysian aircraft MH-17 mistaking it for a Ukrainian Air Force plane. This was apparently a tragic blunder and not a deliberate attack on a passenger airliner. However, before July 17, the rebels had been targeting Ukrainian military aircraft with surface-to-air missiles and had downed over a dozen planes. The attack on the MH-17 was a continuation of the exercise; but tragically, they went horribly wrong, a fact that they realised only later.

The US State Department claims to have evidence that MH-17 was brought down by a Russian-made SA-11 surface-to-air missile fired by separatists close to the Russian border in Eastern Ukraine. The evidence is yet to be made public.

PREVENTIVE ACTION

The destruction of MH-17 by hostile action while operating in an international airway that had not been declared unsafe by the international regulatory authorities, brings into focus the harsh reality that airline safety can be easily undermined by factors over which airlines or the regulatory authorities may not have control at all. The downing of MH-17 is undoubtedly an outrageous act of terrorism. At any point in time, there is military conflict raging in different parts of the world involving two or more nations and/or non-state actors. With surface-to-air missiles becoming increasingly lethal with enhanced range, devastating accuracy, ready availability and easy portability, airliners operating in international airways cannot take for granted immunity to even unintended hostile action by some trigger-happy elements on the ground, as it appears to have happened in the case of MH-17. There is therefore an imperative need to review in its entirety, the vital issue of airline safety.

The immediate solution that comes to mind is the installation of sophisticated missile defence system on airliners. In fact, Israeli airliners are equipped with a device from Elbit Systems called Multi-Spectral Infrared Countermeasure that deflects an oncoming shoulder-fired heat-seeking missile. While this may be an effective solution at low levels against shoulder-fired missiles that have limited range, this system may not be effective against long-range radar-guided missiles.

Installation of sophisticated missile defence systems across entire fleets may be cost-prohibitive making air travel even more expensive and unaffordable by many. Also, such a system will impose new technological burdens on the airline industry. With galloping technology, missile defence systems may become obsolete in a few years requiring upgrade or replacement, an expensive proposition indeed. Also, a single missile defence system may not be able to counter the entire range of guidance systems employed on surface-to-air missiles or provide immunity to the platform from hostile action by combat aircraft armed with guns. Technological innovation to neutralise such threats may therefore not be a viable option.

What is urgently needed is a comprehensive review by the international regulatory authorities of the criteria of defining "Safe Air Corridors". There is evidently a need to be far more discriminatory and to set more stringent standards in this regard. But perhaps the most expedient option at this point in time would be to avoid flying in international air corridors that lie over or in the vicinity of conflict zones. While this may to some extent impinge on the finances of the airlines, the passengers will at least have a safe ride. SP

AIR TRAVEL TODAY IS generally a swift and comfortable affair. Apart from a handful afflicted by the 'fear of flying' syndrome, most passengers are a relaxed and happy lot, with every expectation of safely reaching their desired destination. It was not always so. During the early years, aviation was slow and irksome. As aviators struggled to overcome the numerous problems of powered flight there was no room for fear.

Many were the young pilots who lost their lives as they repeatedly braved the poorly understood hazards of the air. Most flights ended rather abruptly following some technical glitch and supporting staff were always at hand to get the flimsy contraptions airworthy again and render medical assistance if necessary. Passengers showed great courage because they had very little assurance that they would return to earth in one piece. And the first person to make the supreme sacrifice in a powered aircraft was Thomas Selfridge – a passenger.

Little is known about the early life of Thomas Etholen Selfridge apart from the fact that he was born on February 8, 1882, in San Francisco. He graduated from the US Military Academy in 1903 and received a commission in the Field Artillery as first lieutenant. He was trained to fly the Army Dirigible Number One purchased in July 1908. When a requirement came up for a US Government representative to join the Aerial Experiment Association (AEA), chaired by Alexander Graham Bell, Selfridge was the natural choice. He was appointed its first Secretary. Selfridge first flew on Alexander Graham Bell's tetrahedral kite the Cygnet, on December 6, 1907. Later he designed the AEA's first aircraft, officially called Aerodrome Number One, but nicknamed "Red Wing" because of the red silk covering its wings. Although not a qualified pilot, on May 19, 1908, he became the first US military officer to pilot an aircraft when he got airborne alone in AEA's newest craft nicknamed "White Wing" and flew about 93 yards at a height of ten feet.

In January 1907, the US War Department wanted a plane to be designed for the Army Signal Corps and accepted a bid of $25,000 from the Wright Brothers. By August 1908, the aircraft was ready. It was a canard biplane, prototype of the Wright Military Flyer and had a wingspan of 36 feet 4 inches, and a length of about 29 feet. It was powered by a 30-to-40-horsepower Wright vertical four-cylinder engine driving two pusher propellers via a sprocket-and-chain transmission system. It had no wheels, but used skids as landing gear.

THOMAS SELFRIDGE (1882-1908)

On May 19, 1908, Lieutenant Thomas Etholen Selfridge became the first US military officer to pilot an aircraft when he got airborne alone in Aerial Experiment Associations' newest craft nicknamed "White Wing" and flew about 93 yards at a height of ten feet

In order to secure the contract, the Wright Brothers had to prove that the aircraft could carry two people and fly a distance of at least 125 miles at a speed of 40 miles per hour. It had also to be capable of transportation by a mule-drawn wagon. On September 17, 1908, about 2,000 people assembled to watch the third demonstration flight. A new, longer propeller had been installed on the aircraft in order to boost its performance. Orville Wright was the pilot and Thomas Selfridge the lone passenger. The Flyer took off at 5:14 p.m. and slowly climbed to about 150 feet over the parade ground. After about four circuits, Wright heard a light tapping sound behind him. He turned to look over his shoulder at the pusher propeller but did not notice anything amiss. Still, not wishing to take any chances, he decided to shut down the engine and glide to the ground. Then he heard "two big thumps" and the aircraft began to shake violently. Something flew off and the machine quickly became uncontrollable. Although Orville did whatever he could to regain control, his efforts were fruitless. The aircraft plunged towards the parade ground. In the subsequent mishap report Orville stated, "The machine suddenly turned to the right and I immediately shut off the power. Quick as a flash, the machine turned down in front and started straight for the ground. Our course for 50 feet was within a very few degrees of the perpendicular." Thomas Selfridge fractured his skull when his head struck a strut, and he became unconscious. He was treated by an experienced surgeon, but died the same day. He was the first person to die in a crash of a powered aircraft. If he had been wearing a helmet of some kind, it is quite likely that he would have survived the crash. Orville Wright suffered severe injuries, including a broken left thigh, some broken ribs and an injured hip. He was hospitalised for seven weeks.

From the accident investigation it emerged that excessive vibration had caused the propeller to strike a guy wire on the aircraft, tearing the wire from its fastening in the rudder and breaking the propeller off about two feet from the tip. The aircraft crashed from a height of about 110 feet, resulting in its destruction and the death of Lt Thomas Selfridge at the age of 26. Selfridge was buried with full military honours at Arlington National Cemetery. Orville Wright, the pilot on that fateful flight, died at the ripe old age of 76. SP

— Joseph Noronha


1964-2014
50
YEARS
OF SP'S
SP GUIDE PUBLICATIONS
We at SP's
Believe in Relentless Hardwork &
Firm Expansions
DEEP
Rooted Integrity & Trust
SP's Aviation, SP's Land Forces, SP's Naval Forces, SP's Airbuz are -
a. BPA Applied For;
b. Circulated in Asia-Pacific including India backed by BPA endorsement.
Yet another Development that reinstates our
Long-Established Commitment to Aerospace & Defence Fraternity
SCAN TO VIEW
BPA DOCUMENTS
UNPARALLELED, UNMATCHED STANDING
IN THE REGION.
SP'S AVIATION
SP'S LandForces
SP'S NavalForces
SP'S AIRBUZ

QUICKROUNDUP

AGUSTAWESTLAND

AgustaWestland has announced that the Ministry of Defence of the People's Republic of Bangladesh has signed a contract for two AW139 twin-engine helicopters. To be delivered by end-2015, these helicopters will be operated by the Bangladesh Air Force for maritime search and rescue and other utility missions.

AIRBUS

Air Lease Corporation, the Los Angeles-based aircraft leasing company, has signed an agreement for 25 A330-900neo aircraft, becoming the first launch customer for the new Airbus Widebody. ALC simultaneously announced a firm order for 60 A321neo aircraft. The contract was signed today at the Farnborough International Airshow by Steven F-. Udvar-Házy, Air Lease Corporation's Chairman and Chief Executive Officer and Fabrice Brégier, Airbus President and CEO.

Following a decision by the Board of Directors of the Group, Airbus has launched the A330-800neo and A330-900neo, two new members of its Widebody Family, which will incorporate latest generation Rolls-Royce Trent 7000 engines, aerodynamic enhancements and new cabin features.

Hawaiian Airlines announced the signing of a Memorandum of understanding with Airbus to acquire six new A330-800neo aircraft starting in 2019, with rights to purchase an additional six aircraft . Terms of the agreement were not disclosed but the aircraft have a total list-price value of approximately $2.9 billion if all of the purchase rights are exercised.

AirAsia X, the long haul affiliate of Asia's largest low-cost airline, has signed a MoU with Airbus for 50 A330-900neo aircraft. The agreement sees the airline become a launch customer for the latest version of the best-selling widebody. AirAsia X will also be one of the first operators of the aircraft, with deliveries to the carrier scheduled to begin in 2018.

Airbus A320neo (new engine option) Family has reached an important milestone during the Farnborough airshow, having cumulated more than 3,000 firm orders from 57 customers since its launch in December 2010. The milestone was reached when SMBC Aviation Capital ordered 110 A320neo, marking the latest vote confidence for the world's leading single aisle aircraft Family.

During the 2014 Farnborough Air Show, Airbus won $75.3 billion worth of orders for a total of 496 aircraft, making it by far the largest Farnborough show for Airbus – both in terms of dollar value and also in the number aircraft. The deals comprise MoU for 138 aircraft worth $36.9 billion and purchase orders for 358 aircraft worth $38.4 billion.

Hong Kong Aviation Capital, a fast growing aircraft leasing company based in Hong Kong, has signed a firm order with Airbus for a total of 70 A320neo Family aircraft (40 A320neo and 30 A321neo).

Transaero Airlines, Russia's second largest airline, signed a letter of intent with Airbus for 20 A330 aircraft

MILITARY

ASIA-PACIFIC

IAF RECEIVES THE SIXTH C-17 GLOBEMASTER III

The sixth C-17 Globemaster III for the IAF arrived at t Palam airbase on July 28, 2014. The Defence Minister Arun Jaitley visited the airbase and familiarised himself with the aircraft. The Chief of the Air Staff, Air Chief Marshal Arup Raha conducted the Defence Minister through the aircraft and briefed him on its strategic capability and role. He was also given a detailed briefing on the aircraft by Group Captain B.S. Reddy, the Commanding Officer Of the Squadron. The government had accorded approval in June 2011 to buy 10 C-17 Globemaster III aircraft along with associated equipment for the IAF. The first of the 10 aircraft touched down in India on June 18, 2013, and the delivery of all 10 is expected to be completed by December 2014. With its 75-tonne payload capacity, range of 4,500 km and superior performance, this aircraft will enhance the operational potential of the IAF and would provide strategic reach for operations and disaster relief missions. The ceremony was attended by Air Officer Commanding-in-Chief, Western Air Command Air Marshal S.S. Soman and other senior functionaries from the IAF and the Ministry of Defence.

INDIA CONTRACTS FOR SIX C-130J-30

Lockheed Martin Aeronautics, Marietta, Georgia, has been awarded a contract to supply six C-130J-30 aircraft for India through the foreign military sales (FMS) programme of the US Government. The total cumulative face value of the contract is $2,067 million. Work will be performed at Marietta, Georgia, and is expected to be completed by April 30, 2020. Air Force Life Cycle Management Center/WLNNC , Wright-Patterson Air Force Base, Ohio, is the contracting activity. It may be recalled that the Indian Air Force had purchased six C-130J-30s in 2008 for its special operations forces in a package deal with the US Government under its FMS programme for with an option for six. One C-130J crashed during March this year. The C-130J "Super" Hercules is a four-engine turboprop military transport aircraft with major upgrades like new engines, flight deck and other systems. The Hercules family has the longest continuous production run of any military aircraft in history with more than 50 years of service.

PRIVATE PARTICIPATION IN DOMESTIC AEROSPACE ARENA

Defence Minister Arun Jaitley in a written reply in the Lok Sabha stated that "a proposal to procure 56 transport aircraft as replacement for Avro Aircraft through 'Buy & Make' route, had been accorded Acceptance of Necessity by the Defence Acquisition Council (DAC) on July 23, 2012. Of these, 40 aircraft will be manufactured in India by an Indian Production Agency (IPA) from the private sector. The IPA will be chosen by the original equipment manufacturer. Some representations were received wherein primary concern raised related to denying opportunity to PSUs to participate in the procurement process. An Independent Committee was set up to look into the concerns raised. The report of the Independent Committee was discussed in the DAC which in turn, sought the opinion of the Ministry of Law, which has been received. The bid submission date has been extended up to August 28, 2014.

CHINA SUCCESSFULLY INTERCEPTS LAND-BASED MISSILE

China has announced the success of a land-based missile interception test. The test, conducted within its territory on July 23, "has achieved the preset goal", according to a statement posted on the website of the Ministry of National Defense. Military authorities provided no other information about the test. Such test could build shield for China's air defence by intercepting incoming warheads such as ballistic missiles.

INDIGENOUS CIVILIAN AIRCRAFT

Minister of State for Defence Rao Inderjit Singh in a written reply in the Lok Sabha stated, "In the meeting of High Level Committee on Manufacturing on July 9, 2013, chaired by the then Prime Minister, it was, inter-alia, decided that a High Level Steering Group (HLSG) under the Chairman, National Manufacturing Competitiveness Council would work out modalities for the civilian aircraft manufacture programme. Accordingly,

SHOW CALENDAR

20–21 August
INTEGRATED AIR & MISSILE DEFENCE ASIA
InterContinental Kuala Lumpur, Kuala Lumpur, Malaysia
www.airmissiledefenceasia.com

10–11 September
BUSINESS AIRCRAFT EUROPE EXPO
London Biggin Hill Airport, UK
www.miuevents.com/bae2014

16–18 September
MILITARY AIRLIFT
Kensington Close Hotel, London, UK
www.militaryairliftevent.com

17–21 September
AFRICA AEROSPACE AND DEFENCE 2014
Air Force Base Waterkloof, City of Tshwane, Centurion, South Africa
www.aadexpo.co.za

22–23 September
MILITARY FLIGHT TRAINING
Holiday Inn Regents Park, London, UK
www.smi-online.co.uk/defence/uk/conference/military-flight-training

25–26 September
CENTRAL ASIAN BUSINESS AVIATION
Rixos Hotel, Almaty, Kazakhstan
www.aeropodium.com/caba.html

25–28 September
ISTANBUL AIRSHOW
Ataturk Airport, Istanbul, Turkey
www.istanbulairshow.com

9–11 October
AFRICAN AIR EXPO
Kotoka International Airport, Accra, Ghana
www.africanairexpo.com

14–16 October
HELITECH INTERNATIONAL 2014
Amsterdam RAI, Netherlands
www.helitechevents.com

21–23 October
NBAA 2014 – BUSINESS AVIATION CONVENTION & EXHIBITION
Orange County Convention Center, Orlando, Florida, USA
www.nbaa.org/events/bace/2014/

17–18 November
UNMANNED AERIAL SYSTEMS
Marriott Hotel, Regents Park, London, UK
www.smi-online.co.uk/defence/uk/conference/*unmanned-aerial-systems*

the HLSG constituted for the purpose has submitted its recommendations".

CIVIL AVIATION

ASIA-PACIFIC

ROCKWELL COLLINS AVIONICS FOR AIRBUS A320S

Rockwell Collins has announced that the largest carrier in Indonesia—Lion Air—has selected a comprehensive suite of avionics, including the MultiScan™ Threat Detection System and GLU-925 Multi-Mode Receiver (MMR) for 234 Airbus A320 aircraft. Lion Air's selection is one of the largest avionics orders by one airline in Rockwell Collins' history.

INDUSTRY

AMERICAS

LOCKHEED MARTIN DEMONSTRATES JAGM DUAL-MODE GUIDANCE SECTION

Lockheed Martin has recently demonstrated its Joint Air-to-Ground Missile (JAGM) dual-mode guidance section during a second internally funded flight test at Eglin Air Force Base, Florida. During the test, the rail-mounted JAGM flew 6.2 kilometres and initially acquired the target using its precision strike, semiactive laser. The dual-mode guidance section then engaged its millimeter wave radar and the moving target was destroyed. This flight test is a risk reduction milestone critical to Lockheed Martin's performance on the US Army's 27-month Continued Technology Development programme.

GLOBAL UAV MARKET

Teal Group analysts, in their 2014 UAVs integrated market study, estimate that UAV spending will nearly double over the next decade from current worldwide UAV expenditures of $5.7 billion annually to $9.9 billion, totaling just over $77 billion in the next ten years. Brief details are:

- UAV market will be 89 per cent military, 11 per cent civil cumulative for the decade, with the numbers shifting to 86 per cent military and 14 per cent

50 1964-2014 YEARS OF SP'S

QUICKROUNDUP

(eight A330ceo and 12 A330neo). This agreement makes Transaero an important launch customer and the first European airline to commit to the A330neo. The A330s will allow Transaero to continue the massive fleet modernisation programme.

Egypt has ordered eight more Airbus C-295 transport aircraft in a deal which will take its fleet to 20 and makes it the biggest customer for the market-leading tactical airlifter.

Wrapping up its best performance ever at a biennial Farnborough Airshow, Airbus logged new business for 496 aircraft – including 133 wide-body jetliners with agreements involving the newly-launched A-330neo and in-production A330ceo versions, along with the soon-to-enter-service A350 XWB.

ATK

ATK the King Abdullah II Design and Development Bureau have defined the baseline configuration of the medium AC-295 gunships for Jordan. ATK recently delivered two lightweight gunships based on the Airbus CN-235 transport aircraft to the Kingdom and was selected to provide a similar gunship based on the larger C-295 aircraft.

ATR

Nordic Aviation Capital, the largest regional aircraft trading and leasing company with the world's biggest ATR fleet, has signed a total order for 75 ATR 42-600 aircraft, in a deal valued at over $1.55 billion. Deliveries will commence in 2015 through to 2020.

AVIO AERO

Avio Aero has signed a five-year logistic support agreement for the Spey Mk 807 engines fitted to the AMX fighters, known as the A-1 in Brazil, in service with the Brazilian Air Force.

BOEING

Boeing has signed a contract with Iranian flagship carrier Iran Air, becoming the first US company to do so since 1979. According to the contract, Boeing will provide the Iranian airline with airplane parts, manuals, navigation charts, and consultations on plane modification, parts installation and checks.

Boeing and Qatar Airways have finalised an order for 50 777-9Xs, valued at $18.9 billion at current list prices. The 777X order, first announced as a commitment at the 2013 Dubai Airshow, was part of the largest product launch in commercial jetliner history.

Boeing and CIT Group Inc, a global leader in transportation finance, has announced that CIT Aerospace has placed an order for 10 787-9 Dreamliners, valued at

QUICKROUNDUP

$2.5 billion at current list prices. This brings the leasing company's total 787 orders to 20, including 16 787-9s.

Boeing and Intrepid Aviation have announced the leasing company's first direct Boeing order for six 777-300ERs (Extended Range), valued at $1.9 billion at current list prices. Intrepid also has the option to purchase an additional four 777s. If all options are exercised, the value could reach more than $3.2 billion at list prices.

Boeing and Air Lease Corporation have announced that an order for 26 airplanes – six 777-300ER and reconfirmed 20 737 MAX 8 airplanes, valued at $3.9 billion at current list prices.

BOMBARDIER

Bombardier Aerospace announced today that Falko Regional Aircraft Limited has signed two letters of intent in relation to the purchase of up to 24 Bombardier CS100 mainline jets.

CFM INTERNATIONAL

American Airlines has selected CFM International's advanced LEAP-1A engine to power its new fleet of 100 Airbus A320neo family aircraft. CFM values the engine order at $2.6 billion at list price. The aircraft order was originally announced in July 2011 and American will begin taking delivery in 2017.

CFM AT FARNBOROUGH

- Air Lease Corporation has announced an order for a total of 40 LEAP-1B engines to power 10 new Boeing 737 MAX 8 aircraft as well as engines for 10 additional MAX 8 aircraft that were part of a previously unidentified order. The total order at $520 million at list price.
- Air Lease Corporation has announced that it has selected CFM International's advanced LEAP-1A engine to power 20 Airbus A320neo family aircraft at a cost of $520 million at list price. The aircraft were originally announced in June 2012.
- China's Zhejiang Loong Airlines has selected CFM International's CFM56-5B engine to power 11 Airbus A320ceo aircraft. The value of the engine order and associated service agreement is nearly $250 million at list price, including spare engines.
- Interjet, one of Mexico's leading domestic airlines, has announced it has selected CFM International's advanced LEAP-1A engine to power its new fleet of 40 Airbus A-320neo family aircraft. The value of the order, including the long-term support package is $2.9 billion at list price. The aircraft were originally announced in November 2012.
- China's 9 Air has ordered CFM International's LEAP-1B engine to power 30 Boeing 737 MAX aircraft, in addition to CFM56-7B engines to power 20 Next-Generation 737s. CFM values the order at $3.7 billion at list price, including spare engines and a long-term service agreement.
- CFM International has announced that Hainan Airline's has made a commitment to purchase 50 CFM-powered

APPOINTMENTS

RAYTHEON

With immediate effect Tracy A. Atkinson has been elected to the Board of Directors of Raytheon and Thomas A. Kennedy as Chairman of the Board of Directors, Raytheon.

NORTHROP GRUMMAN

Northrop Grumman has appointed Tameika N. Hollis, Vice President, Engineering, Manufacturing and Logistics for the Advanced Concepts and Technologies Division in its Electronic Systems sector.

The Company has appointed four Vice Presidents within its Information Systems sector namely Bobby Lentz as Sector Vice President, Strategy; Tom Afferton, Vice President, Operations, Civil Division; Jay Grove, Vice President, Business Development, Communications Division and Michael King, Vice President, Business Development, Civil Division.

Also appointed are Patrick Neary as Vice President Engineering for Unmanned Systems Programmes and Brett Amidon as Vice President, Engineering and Global Product Development Organization.

The company has named Mark A. Caylor, Corporate Vice President, President of Enterprise Services and Chief Strategy Officer, and Stephen C. Movius, Corporate Vice President and Treasurer.

AIRBUS HELICOPTERS UK

Airbus Helicopters UK has appointed Colin James as Managing Director to lead its UK rotorcraft business.

ATR

ATR has appointed Giorgio Moreni as Chief Financial Officer.

INDIAN AIR FORCE ON JULY 1, 2014

- Air Marshal Ramesh Rai VM, took over as Air Officer Commanding-in-Chief, Training Command, at Bengaluru.
- Air Marshal S Neelakantan YSM VM, took over as Director General (Inspection & Safety) at Air Headquarters.
- Air Marshal Anil Khosla VM took over as the Senior Air Staff Officer of Central Air Command, Allahabad.

RUSSIAN HELICOPTERS

Russian Helicopters have appointed the following:

- Vladimir Artyakov, First Deputy CEO of Rostec.
- Vitaly Baranov, Deputy CEO for Administration of Gazrpom Neft.
- Kirill Gaidash, Head of the Finance and Economics Department of Rostec.
- Dmitry Lelikov, CEO of Oboronprom.
- Vladimir Litvin, Head of the Department of Corporate Procedures and Property at Rostec.
- Vladislav Masalov, CEO of United Engine Corporation.
- Alexander Mikheev, CEO of Russian Helicopters.
- Sergei Skvortsov, Deputy CEO of Rostec.
- Shiv Vikram Khemka, Vice Chairman of SUN Group.

COBHAM

Cobham has appointed Colonel (Retd) H. Shankar as the Managing Director of the company's Indian subsidiary, Cobham India Private Limited.

BELL HELICOPTER

Bell Helicopter, has appointed Roberto Farnese as Regional Sales Manager in Milan to cover sales within Southern Europe.

THALES

Christian Bréant has joined Thales as VP, Director Advanced Studies & Business Intelligence within the Group's Strategy, Research and Technology department.

ROCKWELL COLLINS

Rockwell Collins has appointed Heament John Kurian as Managing Director of the company's Information Management Services Division in Asia-Pacific.

BOEING

Boeing has named Craig R. Cooning President of its Network & Space Systems businesses.

The Company has also announced New Communications Leadership Assignments as under:

- McCormack to lead Commercial Airplanes Communications.
- Toulouse to oversee Brand Management and Advertising.
- Ames to guide Employee Communications.

civil by the end of the 10-year forecast
- US will account for 65 per cent of the worldwide RDT&E spending on UAV technology over the next decade, and 53 per cent of the procurement.
- Payloads, including Electro-Optic/ Infrared Sensors, Synthetic Aperture Radars, SIGINT, EW Systems, and C4I Systems will double in value from $2.8 billion in FY14 to $5.6 billion in FY23.
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BAE SYSTEMS' COMMERCIAL AIRCRAFT SOLUTIONS

BAE Systems' responsibilities on Boeing's KC-46A tanker are nearly as abundant as the aircraft's roles. The tanker can refuel all US and allied coalition military aircraft compatible with international aerial refueling procedures, any time, on any mission and it can carry passengers, cargo and patients whenever and wherever needed. BAE Systems is delivering several subsystems pertaining to flight controls and flight deck systems for the tanker. Specifically, they are providing flap/slat controls, which provide the high lift function during takeoff and landing, as well as the yaw damper controls that enable a smoother ride. On the flight deck, BAE's panels are designed to streamline and simplify control of the cockpit environment. These include instrument control panels and modules, master dim and test, radio tuning, audio control and management and caution and warning systems for the cockpit.

SPACE

AMERICAS

DREAM CHASER SPACE SYSTEM

Sierra Nevada Corporation (SNC) has announced the expansion of its Dream Chaser Space System's global partnership to include Asia and the Pacific rim through a recently signed memorandum of cooperative understanding with the Japanese Aerospace Exploration Agency (JAXA). SNC will work with JAXA on potential applications of Japanese technologies and the development of mission concepts for the Dream Chaser spacecraft. Additionally, SNC and JAXA will explore the possibility of launching and landing the Dream Chaser spacecraft in Japan. Currently, the Dream Chaser is undergoing development and flight test preparations to transport astronauts from the US and partner nations to low-earth orbit (LEO) destinations, such as the International Space Station. The first Dream Chaser orbital launch is scheduled for November 2016. SNC's Dream Chaser Space System is at the forefront of the commercial human spaceflight industry offering safe, reliable and cost-effective crew and critical cargo transportation services to LEO.

EUROPE

AIRBUS DEFENCE AND SPACE TO PRODUCE SES-12 SATELLITE

Airbus Defence and Space has recently been awarded a contract by SES to design and build a highly innovative high-performance telecommunications satellite. SES-12 is the most powerful satellite ever to have been ordered by SES. It will be based on the highly reliable Eurostar E3000 platform from Airbus Defence and Space as an all new EOR (electric orbit raising) version. This version uses only electric propulsion for initial orbit raising and with the reduction in mass enables the satellite to be equipped with an exceptionally large payload. The satellite also incorporates other state-of-the-art solutions, in particular multi-beam antennas linked to a digital signal processor that enables a multitude of basic spectral channels to be allocated to various beams in a completely flexible manner. SES-12 will operate in the Ku and Ka bands with a total of 76 active transponders and will be equipped with eight antennas. It will have a launch weight of 5,300 kg and an electric power of 19 kW. The satellite will be launched in 2017 and will broad band, TV broadcasting and telecom infrastructure services covering Africa to Russia, Japan and Australia. •

QUICKROUNDUP

Boeing 737 MAX aircraft along with Boeing, in the very near future. The final order will be valued at $1.3 billion at list price.

EMBRAER

Embraer S.A. has announced at the Farnborough International Airshow that it has signed a Letter of Intent (LOI) with Azul Linhas Aéreas Brasileiras SA for 30 firm orders for the E-195-E2 jets. The firm order is expected to be completed by the fourth quarter of this year. Besides the firm order, the LOI includes additional 20 purchase rights for the same model, bringing the total potential order to up to 50 E-195-E2 jets.

Embraer SA has concluded an agreement for the sale of 40 aircraft to China's Tianjin Airlines, a subsidiary of the HNA Group, in the presence of Presidents of both the countries. The contract, with an estimated value of $ 2.1 billion at list prices, consists of 20 E-Jets to be delivered in 2015 and 20 E-Jets E2 to be delivered in 2018.

IAG

International Airlines Group (IAG) has signed a memorandum of understanding with International Aero Engines' (IAE) for V2500 engines. IAE will power 30 A320ceo aircraft for the IAG subsidiary, Vueling Airlines. IAE is a multinational aero engine consortium whose shareholders are comprised of Pratt & Whitney (UTX), Pratt & Whitney Aero Engines International GmbH, Japanese Aero Engines Corporation and MTU Aero Engines.

LOCKHEED MARTIN

Lockheed Martin's Block 50 F-16 took off from NAS Fort Worth JRB on July 22 as part of a four-ship ferry to Oman. The aircraft represent the first of twelve aircraft of the second order of F-16s for the Royal Air Force of Oman.

MBDA

MBDA's Storm Shadow missiles are to be fitted to RAF Typhoon fast jets following a £120 million agreement. Storm Shadow is one of the most advanced missiles of its kind which provides long-range air to surface capabilities and, is capable of defeating various targets including bridges, airfields, harbours and parked aircraft.

MBDA has announced that production has commenced of the Brimstone 2 missile at the Lostock and Henlow manufacturing facilities in England. The missile incorporates the latest mmW radar and semi active laser Dual Mode Seeker capability, an Insensitive Munition (IM) rocket motor and warhead, and a new and stronger airframe for increased air carriage robustness. This new missile will enter service with the Royal Air Force on Tornado GR4s and is now contracted to be evaluated for Typhoon.

EXTEND A HELPING HAND

REPORTS IN THE MEDIA in the recent past indicate that the Ministry of Defence has cleared a project for the replacement of the 56 Avro aircraft in the transport fleet of the Indian Air Force (IAF). The unique feature of this decision is that the this project will be executed by the Indian aerospace industry in the private sector in collaboration with a global aerospace major and not by the sole Indian aerospace major Hindustan Aeronautics Limited (HAL), a defence public sector undertaking (DPSU) that all along, has had complete monopoly on production of military aircraft, most of it manufactured under licence. The private sector has so far been excluded from participation in defence-related industry, especially those related to military aircraft

In February 2013, speaking at an International Seminar on "Aerospace Products—Challenges in Design to Development", Air Chief Marshal N.A.K. Browne, the then Chief of the Air Staff stated, "We will release a request for proposal to acquire 56 cargo aircraft from the private sector to replace the obsolescent fleet of indigenously-built medium-lift Hawker Siddeley HS-748 Avro transport aircraft with the IAF." He went on to say, "Acquisition from non-public sector undertakings will encourage the Indian private sector to design and develop a modern transport aircraft for military operations." The plan as available in the public domain is that of the 56 aircraft, 16 would be procured off-the-shelf from the selected foreign vendor and the remaining 40 would be built in the country by a private consortium of foreign and domestic aerospace companies. The indigenous component in the first 16 aircraft will be 30 per cent and in the remaining 40, it will be 70 per cent.

This decision by the government is a clear indication of its intent to develop an indigenous military-industrial complex beginning with the establishment of manufacturing infrastructure in the military aviation segment. A successful venture of this kind will encourage small and medium enterprises to undertake manufacture of sub-systems, accessories and spare parts for both the Indian and overseas markets.

While the intention of the government is undoubtedly noble and the general view is that the decision was long overdue, it must take into account a number of factors that possibly could prove to be serious impediments that the private sector may find insurmountable if left to fend for themselves. Given the plethora of controls, regulatory mandates and bureaucratic indifference, the environment in the country is not business-friendly. The government would have to address this comprehensively and take positive steps to remove this malaise. Besides, for the Indian aerospace industry in the private sector to prosper or even to survive in the regime of the defence industry, the essential prerequisites for them are low investment, easy availability of funds, ready access to high-end technology, economy of scale, market opportunities as also speedy and handsome returns. Also, in defence-related production, certification can be an issue as the company could well find itself in distress if its product fails to clear this hurdle. For the public sector company, this factor is not critical at all as with assured funding by the government, the project can continue endlessly.

A venture in the aerospace industry entails sizeable investments and for it to be viable, the market would have to provide a high degree of assurance and would have to be proportionately large enough. In the project in question, the number of aircraft to be produced in India being a mere 40 and the prospects for export not guaranteed, it is unlikely to inspire much confidence in the leading players in the Indian private sector who have the financial strength to foray into capital-intensive aerospace industry.

Largely in the hands of the private sector, the aerospace industry across the globe that has registered phenomenal technological progress over the last seven decades in the post-World War II era, has not only become highly advanced but fiercely competitive. This would pose a formidable challenge for any new player aspiring to foray into this field especially the Indian aerospace industry in the private sector.

In the final analysis, mere ending of the monopoly of HAL will not be sufficient for the private sector to deliver. This unprecedented step by the government may appear as good news for the Indian aerospace industry; but will not be able to produce the desired results unless it is supported by a far more liberal policy on foreign direct investment, well beyond the current level of 49 per cent. Besides, as the Indian aerospace industry in the private sector cannot hope to survive only on the domestic market, it will be incumbent on the part of the government to facilitate its integration with the global aerospace industry. Without these, the exercise may not takeoff. SP

—By Air Marshal B.K. Pandey (Retd)

Mere ending of the monopoly of HAL by itself will not be sufficient for the private sector to deliver

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