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- Spotlight on airport security
- Regional airlines: Glimmer of hope

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IAF MODERNISATION

Are we on track?



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b e y o n d t h e b o u n d a r i e s o f e x c e l l e n c e

II

The gradual induction of Su-30K and later, the Su-30MKI (seen here) into the IAF helped stem the downslide in fighter force aircraft to some extent



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IAF MODERNISATION

A comprehensive analysis of the Indian Air Force's current strength and the effort required to ensure it emerges a force to reckon with—especially in light of the growing clout of India's nettlesome neighbours.



Cover Photo:
The IAF is initiating upgradation plans for its existing fighter fleets, such as the MiG-29.

Photo Credit: Abhishek Singh

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A Chinook helicopter is shown in flight over a vast, snow-covered mountain range. The helicopter is carrying a large net basket suspended from its hoist, which contains several yellow crates. The scene is set in a high-altitude, cold environment with steep, snow-covered peaks and a clear blue sky.

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SP's Report



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Photo Contest Winner



Soumik Pyne
New Delhi, India

SHOULD THE IAF BE SOLE CONTROLLER OF AIR ASSETS?

• Yes • No • Don't Know

Join the Poll & comment



Amid the growing buzz of the IAF's determined drive to inject a fresh lease of life through acquisition and modernisation, SP's proudly welcomes its readers to Defexpo 2010 in the prestigious capacity of the show's official media partner

SP's *Aviation* continues to track Indian Air Force's determined drive to modernise/augment its operational assets to not only regain its lost glory, but also to build additional capabilities to effectively meet the emerging threats and increasing challenges. In the process, the IAF is looking at full-spectrum capability enhancements that include not only the fighter, transport, and the helicopter and trainer fleets, but also air defence and other support equipment. In the lead are its efforts to arrest the downslide in the numerical strength of its jet fighter squadrons. It is only hoped that there will be no undue delays in the MMRCA and the indigenous Tejas programmes. The IAF would do well to enlarge the levels of its MMRCA and Su-30 MKI acquisition programmes to build up its fighter force to 42 squadrons by the end of India's 13th Five Year Plan.

On the rotary wing front also, the IAF has apparently got a 'wake-up' call and initiated a slew of measures to modernise and augment different categories of its helicopter fleets. Out of a total planned procurement of 695 helicopters for the armed forces, the IAF's share comes close to a healthy figure of 300. On the transport front, after a gap of almost twenty years, the IAF is all set to witness a quantum leap in its air transport capabilities. Rapidly warming relations with the US and the IAF opting for the C-130J Super Hercules and the C-17 Globemaster III mean that in the coming years, American origin aircraft could well be the major components of the IAF's air transportation capabilities. The edition also carries a write up on the IAF's quest for enhancing the UAV capabilities.

As the operational capability of the IAF is founded on the attributes of its trainer fleet, it is imperative on the part of the IAF to give due priority to this segment of its infrastructure which is plagued with many deficiencies. The IAF needs to induct new types of basic and intermediate jet trainers (IJT) and continue to build on its advanced jet training capabilities.

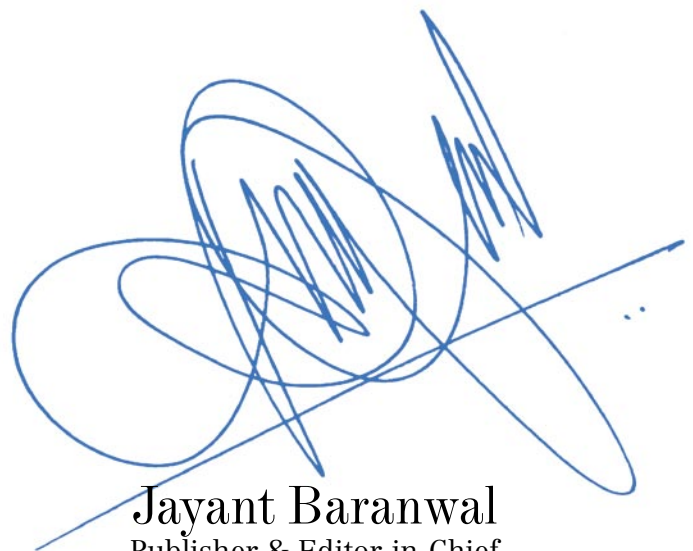
An historical milestone was achieved with the Indo-Russian joint venture PAK-FA taking to the skies for the first time from the Sukhoi's facility at Komsomolsk-on-

Amur in Siberia, Russia on January 29. The Indian version of the PAK-FA twin-seat is also being developed with the IAF hoping to induct the fifth generation fighter around 2017.

On the civil aviation front, the recent spurt in the number of air travellers in India has encouraged new entrants to start operations as regional carriers. But elsewhere Air India/Indian combine continues with its dismal performance. The much touted merger appears to have failed miserably with the talks of a de-merger gaining ground. The Last Word again sums it up—privatise or perish—as the only mantra for the doomed public sector behemoth.

All this and much more. SP Guide Publications are all set to welcome its readers and guests at the upcoming India's Defexpo 2010 in the prestigious capacity as the show's official media partner.

See you there!



Jayant Baranwal
Publisher & Editor-in-Chief

Jointness *is the way of the* FUTURE



Chief of the Air Staff Air Chief Marshal P.V.Naik, in the concluding portion of his interaction with *SP's Aviation* Senior Visiting Editor Air Marshal (Retd) V.K. Bhatia, highlights vital issues at the centre stage of the Indian Air Force's efforts to adopt and assimilate the latest in concepts and technology

***SP's Aviation* (SP's):** What is the latest on setting up the much awaited 'Space Command' to cope with the ever increasing challenges in this field? What will be the shape and size of the command? Also, how will it be ensured that in the likely set up, interests of the Indian Air Force (IAF) are fully safeguarded?

Air Chief Marshal P.V. Naik (CAS): The establishment of a 'Space Command' is a long and deliberate process. At present, an Integrated Space Cell (ISC) working under the aegis of HQ IDS (Headquarters Integrated Defence Staff) is coordinat-

ing the space requirements of all the three services. The ISC's mandate is to interface with the ISRO (Indian Space Research Organisation), DRDO (Defence Research and Development Organisation), NTRO (National Technical Research Organisation) and other civilian organisations and also advise the services on building the requisite capabilities in the space domain.

Meanwhile, the IAF is consolidating its space requirements. The main thrust of the IAF is to leverage the existing space assets of the country to strengthen its infrastructure. Space based capabilities are increasingly being employed in

Based on requirements of the dynamically changing human resource environment, the relevant policies are suitably honed and tuned to meet the aspirations of the air warrior in achieving the goals of the IAF.



the IAF for force enhancement role in areas like communications, surveillance, navigation, meteorology and SAR (Search and Rescue) applications.

The operational role of each service in future conflicts and utilisation of space assets in enhancing combat effectiveness would play an important role in shaping the future space organisational architecture. Though the envisaged 'Space Command' will be a tri-service setup in the years to come, the IAF strongly believes that it has a major role to play in shaping the future space organisation of the defence forces.

SP's: It has often been stressed that the aerospace industry in India cannot be managed as just a public sector endeavour but needs to be integrated with the private sector to ultimately achieve the goals of self-reliance. What, in your opinion, should be done to realise the above-stated objectives and what role can the IAF play in achieving the end results?

CAS: The Indian aerospace industry is evolving rapidly. It has the potential and the technological skills of manufacturing, supplying and sustaining systems for the IAF. However, rapid changes/advancements in the field of aerospace technology and over-run of timelines have been the main reasons for the Indian industry not growing at a rate commensurate with technology. It also needs a huge capital investment along with a robust R&D set-up. To overcome these problems, the private sector could definitely provide help. On the part of the government and the MoD, sincere efforts are being made to make the Indian industry more competitive and self-reliant. More numbers of private industries are being encouraged to participate in the design and development of aerospace technology. DPP 2009 has also taken a few steps to encourage the participation of private Indian industries.

SP's: As per the most current reports on China, it is preparing for short duration high-intensity conflicts along its periphery and has advanced considerably in the realm of missile and anti-missile warfare, cyber espionage and

cyber warfare, and aerospace warfare. Has the impact of these developments been analysed and, if so, are there any parallel developments taking place in the Indian armed forces to fully meet the growing challenges?

CAS: We are monitoring all developments that affect our security and will take necessary and appropriate action. The Long-Term Perspective Plan caters for such developments and our requirements. I would like to assure you that the IAF is a formidable aerospace force, capable of thwarting any inimical designs by our adversaries.

SP's: There is a general feeling that in the absence of the Chief of Defence Staff (CDS), the HQ IDS is nothing but an enlarged Defence Planning Staff which was its forerunner. What are your views on the subject?

CAS: Jointness is the way of the future. The changing security environment and nature of threats in the future would necessitate armed forces to operate jointly and in close coordination to achieve desired results. This is only possible if all planning and execution is done in a joint environment. The CDS has to be the single point of contact to the Defence Minister concerning all defence matters. In my opinion, the HQ IDS is doing a fair job towards enhancing integration between the three services. The services HQs and the HQ IDS have to create an environment which would help in accepting change willingly, with minimum turmoil.

SP's: Human resource management has always been a challenging task for any organisation. Do the present human resource policies truly reflect the aspirations of the air warrior or do they need to be further honed to get the best results?

CAS: The air force is a war fighting organisation wherein human resources are extremely vital. War fighting calls for the ultimate sacrifice for the security of our nation. Hence, our human resources have to be the best as it is the man behind the machine who eventually decides the outcome of a military operation. It is, therefore, important that this resource is

effectively trained and managed to produce optimal results. Towards the same, the IAF has a host of human resource policies covering practically every issue that impacts the air warrior. These are reviewed at regular intervals to assess their continued applicability to emerging human resource environments. When drafting a human resource policy at the service HQ, the primary inputs are drawn from the environment. This helps gauge the pulse and requirement of air warriors across various formations. These inputs are refined and produced as a human resource policy. Hence, policy is dictated with the twin aim of meeting service goals, personal aspirations and development. As far as honing of such policies are concerned, based on requirements of the dynamically changing human resource environment, the relevant policies are suitably honed and tuned to meet the aspirations of the air warrior in achieving the goals of the IAF.

SP's: It has been often stated that for effective jointmanship, officers of the Indian armed forces and certain other government agencies should be trained together in the art of formulating national and military strategies and in applying operational art to achieve political objectives of war. For this and for higher education in defence and security studies, need for establishing a

Indian National Defence University (INDU) and a National War-gaming Centre (NWC) has been felt for a long time. What is causing the delay in raising the INDU and what are your views on NWC?

CAS: Formation of the INDU is inescapable as it would ensure effective jointmanship, assist in formulation of national and military strategies, as well as help in applying operational art to achieve political objectives. The College of Air Warfare, College of Defence Management and National Defence College would then be brought under the proposed INDU. The project is high on priority and is being actively pursued by Dir (INDU), HQ IDS. At present, the Draft Note is under preparation at the MoD for 'In Principle Approval' by the Cabinet. Also, the issue of accepting 'UGC Norms', which could result in the dilution of control of the armed forces over INDU, are being deliberated upon by the Ministries of Human Resource Development and Finance. Identification of location of the INDU has also taken time. Now the proposal offered by the Government of Haryana has been accepted and the other details are being worked upon.

SP's: Notwithstanding the recent statements by the Prime Minister (PM), Dr Manmohan Singh, and you, is there a likelihood of the armed forces getting involved in India's

THERE'S A NEW SHAPE IN THE SKY.



The collage features six panels, each showing a person looking upwards with a sense of aspiration or awe. The panels are arranged in a 2x3 grid. Below each panel is a small icon of an Airbus military aircraft and its model name:

- Top-left: A young man in a black shirt looking up with his hand to his forehead. Below: C-212.
- Top-middle: A soldier in a camouflage helmet looking up. Below: CN-235.
- Top-right: A young couple smiling and looking up. Below: C-295.
- Bottom-left: A young boy in an orange shirt with arms raised, looking up. Below: A400M.
- Bottom-middle: A young man in a light blue shirt looking up. Below: A330 MRTT.
- Bottom-right: A firefighter in a red helmet and goggles looking up. Below: A330 MRTT.

internal security problems, such as the Naxal militancy, which has been described by the PM as “the single biggest internal security challenge ever faced by our country”? Do you feel the country’s paramilitary and concerned states’ police forces will be able to manage on their own? What sort of role do you perceive for the IAF in anti-Naxal operations?

CAS: Naxal militancy is the single biggest internal security challenge faced by our country, and I feel that the state police forces and paramilitary forces would be able to handle the problem. The armed forces can provide the training and support role in these operations. The IAF could be employed for transport support, casualty evacuation and other support roles.

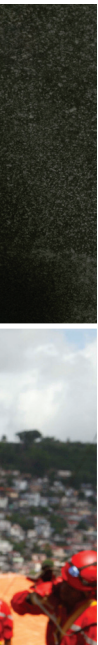
SP’s: Given the limited number of Kiran jet trainers left on the inventory of the IAF, do you believe that an all-jet training is a viable and sustainable proposition? What steps are being taken if any to provide replacement for the HPT-32 fleet and in what timeframe should we expect this to happen?

CAS: The all-jet training programme adopted by the IAF after grounding of the HPT-32 aircraft is a viable proposition, but not a sustainable one. Training on Kiran aircraft at the AFA

(Air Force Academy) has already commenced with a modified syllabus. The course would move on to the next stage in time. However, with the Kiran resources being utilised at a faster pace, the IAF would soon face a shortage of Kiran aircraft, too, if the Intermediate Jet Trainer programme timelines are not met by HAL (Hindustan Aeronautics Limited). The crunch of Kiran resources would definitely be felt by 2012-13. A case for suitable replacement of the HPT-32 is being progressed at Air HQ. Request for proposals for 75 aircraft (buy) are being floated to global firms. These aircraft should start coming in by 2012 - 2013. The remaining ‘Make’ aircraft would be made by HAL and delivery is expected later.

SP’s: Do you agree with the prevailing premise that the defence procurement process is still far from satisfactory, resulting in it being one of the major reasons for the delay in capability building of the armed forces? If so, what is being done to refine the process?

CAS: No, it is not correct. A time bound procedure, as laid down in Defence Procurement Procedure 2008, is followed for all capital procurements. Waivers are sought at appropriate level in case of deviations from the laid down timeframe. These are being monitored at the highest level. The procedure is constantly reviewed and improved upon. You may be aware that



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SP's: India's failure to evolve responses to Pakistan's asymmetric provocations has seriously damaged its deterrence and credibility. Do you feel there is a need to change this policy and, if so, what additional capability would the IAF require to be capable of a more assertive and result-oriented response?

CAS: The decision to take appropriate action against another nation rests with the national leadership. India is a peace loving nation which has no hegemonic designs. It prefers diplomatic dealings before resorting to a military response. As far as the IAF is concerned, it is fully capable and prepared to tackle any contingency, across the complete spectrum of conflict and to keep this edge, we continue to enhance our capabilities.

SP's: What are your views on employment of women officers for combat duties? Would there ever be women fighter pilots in the IAF? If yes, in your opinion, how should this transformation take place?

CAS: It has now been over 15 years since the IAF inducted its first non-Medical Branch woman officer. In these 15 years, the employment philosophy has transformed itself to ensure better and widespread utilisation of women officers across the spectrum of branches. Today, women officers are employed in every branch of the service. As of now, we have about 800 women officers. Transport and helicopter women pilots are

employed in operational roles. Similarly, women officers across the spectrum do not have any posting restrictions. Thus, in my opinion, women officers are being employed everywhere. But, at present, there is no plan to employ women as fighter pilots. Medical and physical demands are few of the constraints. In my appreciation, I do not foresee any change in this employment philosophy in the near future.

SP's: What concrete steps are being taken to ensure availability of suitably skilled manpower in adequate numbers to absorb a plethora of new acquisitions and the many more in the pipeline?

CAS: A composite assessment of manpower requirement for the IAF for the next three Five Year Plan periods has been carried out. It is true that the force structure is poised to grow significantly over these years with greater requirement of trained manpower. Steps have been taken to address the manpower demands for the future. For one, manpower induction has been enhanced significantly over the last two years and such enhancement would continue over the next decade or so. A higher number of personnel are also being trained as instructors so as to address the induction increase. The training patterns have also been modified in keeping with the envisaged requirement of the future. It is felt that these steps would help meet the manpower requirement for the future force enhancement. SP

(Concluded.)



FRENCH CONNECTION:
FRENCH RAFALE BEING
OFFERED BY DASSAULT
AVIATION FOR INDIA'S
MMRCA REQUIREMENT

REBUILD & Rejuvenate

While the IAF is on the path of decline in numbers of fighter aircraft, China and Pakistan are on an upswing of force accretion and modernisation

HAS THE MASSIVE **DOWNSLIDE** in the number of jet fighter squadrons in the Indian Air Force (IAF) which started in 2002 and quickly rose to an alarming rate finally been halted? Is the World's so-called fourth largest air force now poised for a resurrection from the 'rock bottom', or, the downslide is likely to continue for some more time? Has the IAF got a workable rebuild programme for its fighter force? Which way is it heading to rejuvenate itself to reach the required numbers? These are a few of the many tough

By **Air Marshal (Retd)**
V. K. Bhatia



questions facing the IAF. In short, is the IAF on track for its much needed modernisation/augmentation?

To redux, throughout its long and tortuous history, the IAF has generally fumbled through the processes of creating the necessary capabilities to meet multifarious and ever changing security challenges. This has also been due to the 'knee-jerk' policies of the democratically elected governments which are known to respond only in reactive modes where the country's defence needs are concerned. In the past, after each war it was forced to fight with its adversaries

in the neighbourhood, India proceeded on a soul-searching mission to optimise its defence capabilities. In the 1960s, post two conflicts against China and Pakistan, respectively; various studies were conducted and as far as the IAF was concerned, a recommended force level of 64 squadrons (including 45 fighter squadrons) to effectively meet the challenges of fighting a war against its belligerent western neighbour while maintaining a defensive posture against its northern communist neighbour was accepted at the highest political level. The IAF however, could reach a maximum of only 39 1/2 fighter squadrons, which was achieved during the golden era spanning late 1970s to 80s. This was made possible with the induction of a large variety of aircraft types such as the Jaguars, MiG-23s, MiG-29s, MiG-25s and the Mirage 2000 multi-role fighter jets.

The party did not last for long. The 1990s first witnessed the almost unimaginable and sudden dismemberment of the Soviet Empire at the international front and drying up of financial resources on the domestic front. While the former had a crippling effect on the flow of spares and equipment of the erstwhile Soviet origin, the latter made acquisitions from other sources well nigh impossible. The lethal combination of the two began to be felt at the turn of the century when the older combat squadrons of the IAF started to fold up like discarded playing cards. And, even though the new millennium witnessed new heights in India's economic growth, the IAF went on a reverse curve of decline. Between 2002 and 2008, the IAF lost almost a quarter of its jet fighter squadrons in numerical terms. Currently, the IAF is struggling hard to prevent a further reduction from its lowest level so far, of around 29 squadrons before it can start building it up again to the desired levels.

THREAT SCENARIOS

While the IAF is on the path of decline in numbers of fighter aircraft, its two major adversaries namely, China and Pakistan are on an upswing of force accretion and modernisation. China's modernisation drive to replace its antiquated weapon systems with the help of Russian technology and expertise led to rapid transformation of its Air Force (PLAAF) which, by 2005, had acquired close to 400 Su-27/Su-30 aircraft. The numbers continue to increase with China's home production of J-11 aircraft. In addition, indigenous production of other types such as JH-7/7A, FC-1 and J-10 is progressing at a feverish pitch. PLAAF is close to realising its aim of having a predominantly fourth generation air force providing it with all-pervasive capabilities of a modern, state-of-the-art, offensive air arm with matching support systems in a network-centric warfare scenario.

Pakistan on the other hand, has been supplied with more than \$11 billion (Rs 52,860 crore) worth of

modern weapon systems, including the latest version of F-16 aircraft by the US as its partner in 'GWOT' (Global War on Terror). In addition, Pakistan with help from China has started domestic production of the JF-17 (Chinese FC-1) with the PAF (Pakistan Air Force) being given maximum priority to transform itself into a modern fighting force. Soon, India could be confronted with 1,500 to 2,000 modern generation fighters at its two borders. It is against this backdrop, the IAF has to build itself to successfully face the emerging threats and future challenges.

AUGMENTATION OF FORCE LEVELS

Till recently, more than two-thirds of the IAF combat squadrons had MiG-21 variants. When these and the other older models such as the MiG-23 variants began to wind up, the situation started to take a grim turn for the service. The saving grace was the gradual induction of Su-30K and later, the Su-30 MKI aircraft into the IAF which helped stem the downslide to some extent. In addition, with fresh induction of a few more Mirage 2000 aircraft, the IAF was able to squeeze out a third squadron from the available resources. The IAF has also been able to reequip one more squadron with fresh induction of HAL-produced Jaguars. But they prove to be the proverbial 'drops in the ocean'. It is not that the IAF did nothing about the impending erosion in the number of its fighter squadrons. The IAF floated an RFI (Request for Information) as early as 2001 for a 126-aircraft medium multi-role combat aircraft (MMRCA) for a global tender, but because of the painfully slow governmental acquisition processes, it has only recently crossed the hurdle of RFP and moved on to the Flight Evaluation stage, after an agonising wait of nine years. Even if all the remaining stages of the procurement process are dealt with most expeditiously, there is little possibility of an in-service induction of the



selected aircraft before 2014-15. The global competition for the mega-billion dollar deal includes the US Boeing F/A-18 E/F Super Hornet and Lockheed Martin F-16IN Super Viper, the French Dassault Rafale, the European Eurofighter Typhoon, the Swedish SAAB Gripen NG and the Russian Mikoyan MiG-35.

India's own jet fighter programme, the LCA, is running way behind schedule and induction of even the IOC (Initial Operational Clearance) aircraft are likely to miss the revised deadline of 2011 to enter restricted operational service in the IAF. With the indigenous 'Kaveri' having failed the muster, the question of selecting an appropriate engine for the 'Tejas' is yet to be addressed. Till then, the IAF will have to do with the under-powered GE F404 version (<80 kN thrust) being installed in the first 20 aircraft on order with the HAL.

THE WAY AHEAD

As brought out earlier, the massive combined accretion in the form of close to 2,000 high tech state-of-the-art jet fighters in India's two neighbouring adversaries, poses a formidable challenge to India's security. Today, the PAF alone is fast closing the gap with the depleted strength of IAF's fighter force. The IAF has taken some steps to correct the dismal situation, but the process is painfully slow and needs to be speeded up. Apart from initiating upgradation plans for its existing fighter fleets that still have adequate residual operational life such as Mirage 2000, MiG-29 and Jaguars, the IAF is progressively inducting additional Su-30 MKI aircraft in a bid to arrest any further downslide in its Combat squadrons' strength. The IAF needs to pursue the 126-aircraft MMRCA programme vigorously to ensure no further delays take place in the acquisition processes. Only then it

2020: LIKELY FIGHTER FORCE LEVELS			
Planned Inductions (with additional Su-30 MKIs)			
Role	Aircraft Type	Numbers	Number of Squadrons
Air Dominance	Su-30 MKI	230 (+50,+50)	12 (17)
Air Superiority	MiG-29	50	3
MRCA	Mirage 2000	50	3
MMRCA	* To be selected	126	6
Strike	Jaguar	135	5 ½
Light Combat	LCA (Tejas)	120	5
Total		660 (760)	34 ½ (39 ½)

The above figures are a rough estimate

can hope to start inducting these aircraft into squadron service by 2014-15. The IAF has also done well to get additional sanction for 50 more Su-30 MKIs to take the total acquisition tally of this type to 280. HAL seems to have obliged by increasing the rate of indigenous production of Su-30 MKIs, but the effort can only match on a one-to-one basis, the otherwise inevitable number-plating of the concerned squadrons due to forced retirement of older aircraft. On the Tejas front, the government will have to soon decide and select from the two short-listed engines – the General Electric GE 414-400 (97.9 kN/22,000 lb) or, Eurojet EJ200 (90 kN/20,250 lb) – to ensure that, the IAF eventually gets the LCAs with adequate thrust to meet its operational requirements.

However, even if everything goes according to plan, the IAF would still have only 34 to 35 squadrons by 2020, whereas it must aim to at least regain its original strength of 39 ½ squadrons. This could be achieved by HAL continuing to produce Su-30 MKIs in even greater numbers than presently envisaged; with the IAF receiving up to 330 aircraft of this type to equip about 17 frontline combat squadrons.

Further, the Defence Minister, A.K. Antony's prophetic statement – confidently echoed by the IAF Chief, Air Chief Marshal P.V. Naik – of the IAF building up its fighter force to 42 squadrons by the end of the 13th Five-Year Plan (2022), can only come true if the IAF exercises its options of increasing the number of aircraft in its 126-aircraft MMRCA programme to 200, and that

too in a doable time frame. But the whole exercise would be futile unless the Indian government also provides necessary budgetary support. SP



FIGHTER WINGS:
(LEFT) SU-30MKI,
(RIGHT) INDIAN LCA

Exploring New Horizons



After a prolonged period of inexplicable slumber, the IAF has apparently got the 'wake-up' call and initiated a slew of measures to modernise and augment different categories of its helicopter fleets

By Air Marshal (Retd)
V.K. Bhatia

SINO-INDIAN CONFLICT, NOVEMBER 1962—*The Chinese declare a unilateral ceasefire after occupying large tracts of territory in the North East Frontier Agency. But in withdrawal, they leave a large number of wounded Indian soldiers who have to be heli-lifted from Tawang to Tezpur. Air Force Station Tezpur has newly inducted Mi-4s but hardly any trained pilots. The lone Flight Commander is down with raging fever but his is a life saving mission. He takes with him a brand new pilot officer (Plt Offr) posted to the collocated Toofani fighter squadron who has not even touched the flying controls of a helicopter, leave alone fly it. With super-Herculean effort he lifts the chopper past the 'transition', hands over the controls to the young Plt Offr, "Fly it like a conventional fixed wing aircraft and take me to Tawang". "Yes sir. But where is Tawang?" queries the Plt Offr. Looking at his now half-conscious captain, he knows there will be no answer. Gingerly picking up a million-map from the floor of the cockpit, he orientates himself and map-reads his way to Tawang. The 45-minute journey in a state of feverish slumber rejuvenates the ailing captain to a degree that he manages to land without any mishap at the high-altitude helipad. Mi-4 can take only nine passengers. But the line is long and time-criticality for evacuation is such that 18 seriously wounded soldiers come aboard. The overloaded Mi-4 is incapable of a hover take-off from that altitude. The captain lines up at the far end of the helipad, opens full power and sprints down the slope, flinging the heavily laden chopper into the yawning gap below. The plunge helps the chopper quickly pick up safe flying speed, preventing it from crashing into the valley floor (a ski-jump in reverse!). Evacuation is successful.*

THE MI-4 USED IN THE MISSION—with its incredible, unprecedented overload—belonged to No. 109 HU (Helicopter Unit) of the Indian Air Force (IAF) which had been thrust into action right from the moment of its birth, when in 1962 the Sino-Indian war broke out. The helicopter in question was one of the two-aircraft detachment that the unit maintained at Tezpur under Eastern Air

Command, which served extensively in casualty evacuation and logistics missions in and around Tawang, Sela and Bomdila areas of North-East Frontier Agency, later Arunachal Pradesh. As is evident from the above narration, the fledgling unit had received the helicopters ex-USSR and it was still trying to build up its pilots' strength.

But that was almost half a century ago. Post 1962 conflict against China, the IAF clearly understood the impor-



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tance of having a sizable rotary wing force to meet the ever-increasing and multifarious requirements of not only the armed forces but other governmental agencies as well. The induction of the Mi-4 helicopter was to have a profound effect on IAF capability as, with the delivery of these helicopters, major expansion of the IAF rotorcraft inventory began. After the formation of No.109 HU, more units were formed with repeat orders and eventually, by 1966, 120 Mi-4 helicopters were procured. At about the same time, the French Alouette III light helicopters were inducted into the IAF which were later produced in much greater numbers by Hindustan Aeronautics Limited (HAL) under the name 'Chetak' and 'Cheetah'—a derivative of the Alouette III. The IAF helicopter force increased steadily in numbers and in the next two decades it was built to over 500 French and Soviet types. The IAF built its helicopter force with different types flaunting varied capacity and capability and included lightweight utility, medium-lift, heavy-lift as also, attack helicopters.

Undoubtedly, the pride of the force has been the Mi-26 heavy-lift helicopter, which has been operated by No.126 HU, with outstanding results in the mountains of Northern India. It achieved a major milestone when during OP 'Meghdoot' it soft-landed an Army one-tonne truck and a Jonga at Daulat Beg Auldi (DBO) post located at a height of 16,500 ft in the Aksai Chin region of Ladakh in 1986. The IAF also inducted Mi-8 medium-lift followed by a stronger version Mi-17 in large numbers to serve in its helicopter units throughout the country, playing a vital logistic support role in all its dimensions. Mi-8/Mi-17s are operated for commando assault tasks, for ferrying supplies and personnel to remote mountain helipads and jungle clearings, for search and rescue (SAR) operations and myriad other tasks which include disaster relief – even electioneering duties. In May 1984, the IAF's helicopter force acquired another dimension with the induction of Mi-25 attack helicopters, used to much effect in Sri Lanka during Op 'Pawan'. The upgraded Mi-35 followed suit in 1990.

In the recent years, the IAF has been inducting the indigenous HAL-developed Advance Light Helicopter (ALH) Dhruv, having received close to two dozen of these by now out of a total initial order of 54, to be completed by 2016.

MODERNISATION DRIVE

The much touted helicopter force of the IAF like its most other assets, however, is on the decline; having been hit by mass-scale obsolescence in a major portion of its helicopter fleets. The IAF currently operates 300+ helicopters in 28-30 units. But for the recently inducted Dhruv helicopters and some Mi-17 1Vs inducted during the past decade all other types are struggling with the problems of old age and inadequate spares/maintenance support. For example, its more than 100 strong Mi-8 fleet is in dire need of replacement including the VIP version operating in the IAF's Communication Squadron. Some of the older versions of Mi-17s are also nearing the end of their service life and need to be replaced. The light utility helicopters Chetak and its lighter and more agile Cheetah version also need to be replaced by more modern and more capable helicopters to do justice to their assigned duties, especially in the high mountainous regions of Ladakh and the Northeast. The At-

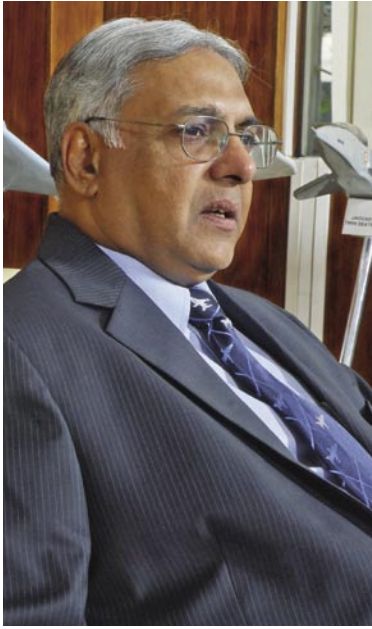
tack helicopter fleets are faring no better and need replacement in a phased manner. But has the IAF taken any steps to rejuvenate its helicopter force to the desired levels of modernisation and capabilities?

After a prolonged period of inexplicable slumber, the IAF has apparently got the 'wake-up' call and initiated a slew of measures to modernise and augment different categories of its helicopter fleets. First, in the medium-lift category, the picture appears to be rosy with the in-service induction of the first batch of 80 Mi-17 V-5 (also known as Mi-171) under a \$1.2 billion (Rs 5,555 crore) with Russia commencing this year. The programme is to be completed by 2013. It is also revealed that the IAF is planning a repeat order of up to 40 more. In addition, as stated earlier, deliveries of the indigenous advance light helicopter Dhruv continue with a total induction of 54 units (38 utility and 16 armed versions). HAL is also developing a LCH (Light Combat Helicopter) which may interest the IAF at a later date.

On the light utility helicopter front, the IAF appears to have gained from a failed Indian Army RFP for 197 helicopters issued in 2001 for urgent replacement of the Army Aviation Corps' equally obsolescent Chetak and Cheetah fleets. It may be recalled, in a deal costing approximately \$600 million (Rs 2,777 crore), Bell 407 and Eurocopter AS 350 B3 were shortlisted. However, anomalies were detected during the flight trials phase and directions were issued for re-tendering by the government. The Ministry of Defence has taken into account the IAF's requirement of 115 helicopters in the same category and has issued a fresh global RFP for 312 helicopters (Army-197 & Air Force-115) worth about \$1 billion (Rs 4,630 crore) to Bell (USA), Eurocopter (France, Germany and Spain), AgustaWestland (Italy) and Kamov (Russia). It is believed that Bell has withdrawn their offer giving reasons that the criteria for offsets stipulated in the RFP were not realistic.

Reports emanating from the Ministry of Defence suggest that for once the 'Defence Acquisition Council' appears to have gone into a proactive high-drive by approving the cumulative acquisition by the three services of as many as 695 helicopters in the near future. These include 384 light-weight, 80 medium-lift, 22 attack, 16 Anti-Submarine Warfare, 15 heavy-lift and 12 VVIP helicopters from foreign vendors, while 166 will be the indigenous Dhruv helicopters. Out of these, the IAF's share could eventually be up to a healthy 300 helicopters or even exceed this figure. Mention has already been made on the light-weight and medium-lift front. In addition, the IAF has reportedly issued the necessary RFP for heavy-lift helicopters with the Boeing C-47 Chinook and the Russian Mi-26 as the possible contenders. Also, the IAF had reportedly zeroed in on the VIP version of the AgustaWestland AW101 helicopter to replace its ageing Mi-8s in its VIP Communication Squadron, but the acquisition process ran into rough weather with India's Finance Ministry because of the cost factor. Hopefully, the matter will be resolved soon and the IAF will be able to induct the much needed helicopter for VIP/VVIP duties. SP

***Note:** The Pilot Officer in the above narration was the author himself, based at Tezpur on his first operational posting after commissioning.*



HAL's R&D CENTRES have SIGNIFICANT WORK to do

HAL Chairman Ashok Nayak, speaking at the Air Chief Marshal LM Katre Memorial Lecture on January 22, outlined the ambitious projects underway and on the anvil even as it strives to increase the share of value added services to the IAF. *Extracts from the speech.*

HAL (HINDUSTAN AERONAUTICS LIMITED) has grown and diversified, and aspires to become a global aerospace company. HAL's major objective is to be a partner of the IAF (Indian Air Force) as it has been during the past seven decades, unwavering and steadfast. HAL would strive to meet the requirements of IAF—be it in the form of new aircraft production or in keeping their fleets airborne through comprehensive maintenance support. HAL has been tasked with a major role in the modernisation of the IAF.

We are currently producing the Su-30MKI, Hawk and ALH (Advanced Light Helicopter) for induction into the IAF. Compared to the ALHs inducted earlier, the current batch has been upgraded by integrating several sensors and mission equipment to increase effectiveness and survivability in hostile environment. These ALHs sport the Shakti engines for high altitude operations up to 6 km altitude. Electronic Warfare Suite, electro optic sensor, Integrated Display Systems and other systems make this helicopter stand apart in its class. Weapons are also being integrated into the helicopter and these armed helicopters will be ready for delivery in 2011.

The R&D centres of HAL have significant work to do in the current decade. HAL has a number of launches in this period—the Light Combat Helicopter, Light Utility Helicopter, Turboprop Trainer, Multi-role-Transport Aircraft, Fifth Generation Fighter Aircraft and the Indian Multi-role Helicopter. The first prototype of the Light Combat Helicopter (LCH) is all set to make its maiden flight shortly. This is the first attack helicopter to be designed indigenously and tailor-made to suit IAF's dedicated requirements. LCH and other future acquisitions planned by the IAF through HAL would make it a formidable air force to reckon with by our adversaries. HAL

is gearing up to meet the challenges of handling these new projects along with the production runs of the existing ones. A blueprint is in place for creation of new divisions, modernisation and upgrade of existing plants, providing increased thrust to indigenous technology development, productivity and qual-



STRIVING TO DELIVER:
HAL-PRODUCED SU-30 MKI (LEFT) AND ALH DHRUV (RIGHT)

ity improvements to meet the challenge. Our production systems have already been acknowledged by major global aerospace companies through their sourcing programmes.

Apart from producing aircraft and supporting their maintenance through overhauls, spares support and mid-life upgrades, HAL is now contemplating extending its footprint to the squadron level. We are now looking at providing a comprehensive performance-based logistics solution through first and second line maintenance, thus increasing the share of value added services to the IAF. HAL would make a proposal to IAF shortly in this regard as we consider this will enable the force to focus more on the operations and strategy than on maintenance of its assets. **SP**

ITALIAN CREATIVITY:
C-27J SPARTAN IS INCHING
TOWARDS SUCCESS IN
THE EXPORT MARKET

HEAVY-LIFT

HOPEFULS

If the 1980s witnessed a quantum leap in the IAF's air transport capabilities, the coming decade could be even more significant. Rapidly warming relations with the US mean that a decade or so from now, American origin aircraft could well be the major components of the IAF's air transport capability.

A QUARTER CENTURY OF DISTINGUISHED service as mainstays of the Indian Air Force (IAF) air transport fleet—that's the inspiring story of the Ilyushin Il-76 and Antonov An-32. The An-32 was inducted in early 1984 and the Il-76 MD followed a year later to dramatically enhance the IAF's air transport capability. Around 14 Il-76 four engine jets and perhaps 104 An-32 twin turboprop aircraft are still operational. Day in and day out these workhorses of the IAF get airborne, often before dawn, from bases in the north and east, on air maintenance missions to remote forward and high-altitude areas. Mission successful, back to base; but there's no rest.

Ceaselessly crisscrossing the country with urgently needed consignments, their hectic schedule can be gauged by a re-

By **Group Captain (Retd)**
Joseph Noronha, Goa



port last month that the IAF was finding it difficult to schedule five Il-76 sorties for airlift of supplies and equipment for two important NHPC projects in Jammu and Kashmir. Besides, serviceability has rarely been top-notch. The IAF has for years been plagued by a shortage of spares and unsatisfactory after-sales service for its Soviet/Russian sourced aircraft. However, rapidly warming relations with the US and the IAF's determination to acquire only the best mean that, a decade or so from now, American origin aircraft could well be the major components of the IAF's air transport capability.

HEARTY HERCULES

A deal India struck with the US in 2007 for six Lockheed Martin C-130J Super Hercules aircraft for a reported sum of \$1

billion (Rs 3,940 crore) acted as the trigger (*SP's Aviation Defexpo 2008 Special*, Issue 1, Volume 10). The aircraft should join the IAF next year and be based in Hindon, near Delhi. Conceived during the Korean War (the first prototype flew on August 23, 1954) the C-130 has a long and distinguished history. It is perhaps the most important military transport aircraft globally and the most popular ever—around 60 nations currently fly it. Its newest version, and the only one in production, is the C-130J Super Hercules, which became operational in February 1999. Though it looks quite similar to the classic Hercules, it is significantly upgraded with new Rolls-Royce AE2100D3 turboprop engines, six-bladed propellers, digital avionics, and other advanced systems. It outstrips previous models—faster and higher climb, enhanced range at a higher cruise speed, and better short-field performance. It is designed for air dropping troops and equipment into hostile areas and can operate from rough dirt strips.

Basic and specialised versions of the aircraft can undertake diverse roles, including airlift support, special operations, aero-medical missions, weather reconnaissance, aerial spray missions, disaster relief missions, and even fire fighting duties. However, much of its special mission equipment is removable, allowing the aircraft to revert to the basic cargo delivery role if desired.

The IAF hopes to use these versatile multi-role aircraft mainly for special operations missions and would probably like to exercise its option for six more C-130J aircraft in order to acquire a viable capability. But Washington is hardly generous when it comes to sharing sensitive technology. Signing restrictive agreements like the Communications Interoperability and Security Memorandum of Agreement would probably be prerequisites for India to receive key equipment for the Hercules, such as electronic

jamming capability, secure communications and satellite navigation aids.

MASTERS OF THE GLOBE

In another development of great significance for the IAF, the Ministry of Defence last month dispatched a letter of request to Washington for the potential procurement of 10 Boeing C-17 Globemaster III strategic transport aircraft. The direct government-to-government deal, requested via the US Foreign Military Sales programme, is valued at around \$2.5 billion (Rs 11,410 crore). If signed, hopefully this year, it will be India's biggest deal with the US thus far. The C-17s would gradually replace the ageing Il-76s and go some way towards guaranteeing India's future military and humanitarian airlift needs as it shoulders its growing domestic and international responsibilities. Ten more C-17s could be ordered later to build a viable strategic airlift capability.

Currently, there are 212 C-17s in service globally, but only 19 with operators outside the US. The C-17 carries a payload of around 77 tonnes, which is nearly double the 43 tonne capacity of the IAF's Il-76. To view this in perspective, the Il-76's capacity is itself more than twice that of the C-130J Super Hercules which has a maximum load limit of 19 tonnes.

The C-17 is no debutante—its first flight took place on September 15, 1991. It can land combat-ready troops on semi-prepared runways or airdrop them directly into the fight. It has a propulsive lift system that allows it to operate from runways as short as 3,500 ft (1060 m) and as narrow as 90 feet (27.5 meters). In addition, it makes use of blown flaps, vortex generators, and thrust reversers for exceptional short field performance. Despite its massive size, the C-17 can take off and land at steep angles—an important capability in battle conditions. Its ability to reverse allows it

HEAD TO HEAD

							
	C-17	C-130J	MTA	*Il-76 MD	*An-32	A400M	C-27J
Length (m)	53.04	29.80	33.2?	46.59	23.78	45.10	22.70
Span (m)	51.74	40.40	30.1?	50.50	29.20	42.40	28.70
Height (m)	16.79	11.60	10.0?	14.76	8.75	14.70	9.64
Max take-off weight (kg)	265,300	69,750	70,000?	170,000	27,000	141,000	31,800
Max payload (kg)	77,500	19,090	18,500	43,000	6,700	37,000	11,500
Range with max payload (nm)	2,420	1,800	1,350	2,200	1,080	2,450	1,000
Max speed (knots)	450	320	470	490	286	420	325
Engines	4 x turbfans	4x turboprops	2x turbfans	4x turbfans	2x turboprops	4x turboprops	2x turboprops

*Currently part of IAF fleet; ? approximate figures as the aircraft is under development;

Source: Websites of respective OEMs / Global Strategy website and Wikipedia

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r i e s o f e x c e l l e n c e



Replacements for the An-32 will probably become necessary before the end of the coming decade. Alenia's C-27J Spartan and the EADS-CASA C-295 may be contenders, if no other suitable transport aircraft is developed by then.

to manoeuvre on narrow taxiways and congested aprons. It can fly 2,400 nautical miles without refuelling at maximum load. However, what the C-17 is best at is ferrying about half its maximum load, half way around the world, non-stop. The aircraft is operated by a crew of just three (pilot, co-pilot and loadmaster). This reduces manpower requirements, risk exposure and long-term operating costs.

DISTINGUISHED SERVICE: THE ANTONOV AN-32 WAS INDUCTED INTO THE IAF IN EARLY 1984

MTA MARATHON

But the IAF is unlikely to make a clean break with Russian transport aircraft just yet. India and Russia have been in discussion to jointly produce the proposed Multi-role Transport Aircraft (MTA) for the better part of a decade. Some more time is likely to elapse before the project actually gets off the ground. The MTA is a medium-lift military transport aircraft which will be constructed by a joint-venture formed by the United Aircraft Corporation (UAC) of Russia and Hindustan Aeronautics Limited (HAL).

Both companies will reportedly invest \$300 million (Rs 1,385 crore) each. The first prototype aircraft is expected to fly in 2014 and the aircraft should become operational by 2015/16. While UAC plans to establish an assembly line at its Aviastar facility in Ulyanovsk, HAL will set up its facility in Kanpur. The Indian commitment is for 45 aircraft; while Russia needs up to 100. The agreement also reportedly contains the joint intention to market a civilian variant of the MTA in the form of a 100-seat passenger airliner for which HAL will be the lead partner and principal integrator. The aircraft will be equipped with twin bypass turbojet engines, sourced either from Pratt & Whitney or Russian companies, and full fly-by-wire controls.

A DECISIVE DECADE?

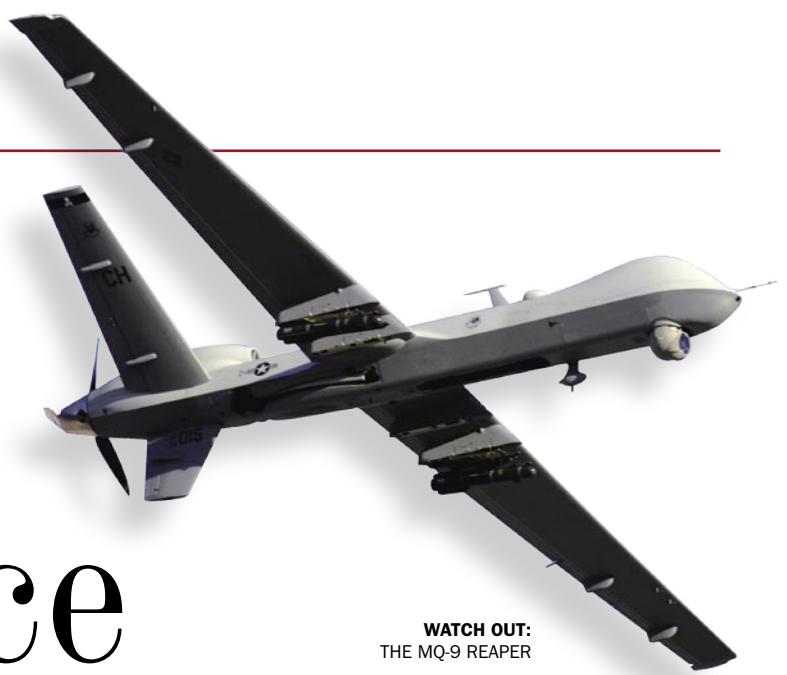
If the 1980s witnessed a quantum leap in the IAF's air

transport capabilities, the coming decade could be even more significant. Military air transport fleets the world over are heavily stretched and some are shrinking. The two year-plus delay in the development schedule of Airbus Military's ambitious A400M—which completed its maiden flight in Spain last December—means that many of Europe's major air forces will probably be hamstrung for military transport aircraft for years to come. The C-17 production is under regular threat of being capped by the US government. Will the C-130J retain its dominant position or will the A400M finally come into its own? Will Embraer get its act together and launch the KC-390, a medium-sized twin-jet military transport aircraft similar in capability to the C-130J? (The KC-390, when it flies in 2013, will be Embraer's largest aircraft.) Will the MTA project finally take off in a big way? Time will tell.

With new aircraft bearing astronomical price tags, upgrades of existing aircraft become imperative. The Il-76 has served the IAF well and still has a residual life of 10 to 15 years after necessary modifications. Enough C-17s need to be inducted to replace these. Last year, a \$400 million (Rs 1,850 crore) contract was signed with Ukraine for the upgrade of 100 An-32 aircraft of the IAF in order to extend their operational life for another decade. The first six aircraft will be modified in Ukraine and the remaining at Kanpur. The C-130J, being in a much heavier class, is not seen as a replacement for the An-32. Still, its requirement is likely to increase beyond the currently envisaged dozen aircraft. Replacements for the An-32 will probably become necessary before the end of the coming decade. Alenia's C-27J Spartan and the EADS-CASA C-295 may be contenders, if no other suitable transport aircraft is developed by then.

The Chief of the Air Staff recently stated that the IAF of the future will increasingly be called upon to ensure the inviolability of India's enhanced strategic borders that now extend from the Straits of Hormuz to the Straits of Malacca and include the Central Asian region. The C-17, C-130J and MTA should help it shoulder these far-flung responsibilities confidently. SP

Usher Aerial Vigilance



WATCH OUT:
THE MQ-9 REAPER

Inching closer to the centennial year of Unmanned Aerial Vehicles in 2018, several countries have already launched programmes for futuristic platforms. It is time India seriously implements current as well as future in-house programmes.



WHILE PRESIDENT BARACK OBAMA has agreed to increase the strength of US troop deployment in Afghanistan,

what may have gone unnoticed is the manifold increase in the use of Unmanned Aerial Vehicles (UAV). The US Air Force (USAF) is using a wide variety of such platforms in Afghanistan for combat-support as well as remote delivery of Precision Guided Missiles and other weapons, over unsuspecting targets. As regards this big 'surge', nearly 400,000 flight hours have been logged by a variety of medium-to-large American unmanned platforms during 2009, which is more than double the figure of 2006-07. Additionally, US Department of Defense has observed that the number of Drones has grown from 300 in 2002 to nearly 7,000 within seven years, leading to a significant increase in the amount of US surveillance coverage in the region.

In terms of reach and lethality, their prowess is such that the proposed supply of 12 UAVs to Pakistan has rightly raised concern in Delhi. Although US officials maintain that these will not be armed, Pakistan is known to operate clandestinely and may modify the platforms with the help of other international partners. After all, Pakistan already

By **Air Marshal (Retd)**
B.N. Gokhale



has many ongoing UAV development projects with China, Turkey and South Africa.

NEXT GENERATION BECKONS

Inching closer to the centennial year of the UAV in 2018, a number of countries have already launched programmes for futuristic platforms. With no risk of loss of life, varied types of technologies are being incorporated both, for the size and shapes, as well as for the payloads. The US Air Force has initiated a programme to develop the Next Generation Unmanned Aerial System (NG-UAS). In May 2009, the US Air Force has sent a proposal to the industry, which seeks a follow-on UAV to the highly successful MQ-1 Predator and MQ-9 Reaper aircraft, latter a much improved variant of the Q-1 series. These UAVs, with the prefix 'M' indicating multi-mission, have proved invaluable in combat operations in Afghanistan and Iraq.

The NG-UAS platform is planned to have capabilities beyond existing UAVs. The next generation of UAVs would be designed to provide covert capability, carry more munitions, and operate at faster repositioning speeds to improve flexibility and survivability. Compared to the MQ-1 Predator which first flew in 1994 and the derivative MQ-9 Reaper



SMART WINGS:
(CLOCKWISE FROM ABOVE)
THE RQ-4 GLOBAL HAWK;
THE MQ-1 PREDATOR FIRST
FLEW IN 1994; THE MQ-9
REAPER

which flew in 2001, the new vehicle would have improved manoeuvrability and time on station among other features. The planned initial operational capability of the NG-UAS would be 2015. General Atomics has already developed a candidate for the NG-UAS role now known as Predator-C. This UAV is believed to have swept-back wings and stealth characteristics. Other firms, notably Northrop Grumman, which produces the highly successful RQ-4 Global Hawk UAV as well as several other firms are expected to enter the competition for the NG-UAVs.

With all-weather and triple-redundant avionics, 70 hours of long duration, UAVs, such as the Israeli 'Eitan', holds great promise. Eitan is also capable of carrying large payloads of 2,000 lbs. Solar powered UAVs are also making progress, which will allow long duration stealth flights at high altitudes. While many of the Western countries are also developing modern UAVs, surprisingly Russia has been a somewhat late entrant in this field. However, they have also launched an ambitious programme of tactical UAVs.

THE SCRIPT IN INDIA

The Indian Air Force (IAF) inducted UAV, in 2000. Searcher II and Heron UAV have distinguished themselves over

the past few years by delivering electro optical/infrared (EO/IR), EW and now Synthetic Aperture Radar (SAR) intelligence, without exposing human pilots to risk. Within a short span of their induction, the IAF has been able to exploit ground and airborne relays to extend the operating ranges and also use them in different terrains including the Himalayan heights. The preparations during Op Parakram have given IAF the expertise in reducing the 'sensors to shooter' cycle. On the other hand, deployment in different parts of the country has enabled the IAF to acquire additional infrastructure, which will help in exploiting UAVs in different roles, including disaster management and internal security. Incidentally, Israel-made UAVs are also being used in Afghanistan by the French, Canadian and British forces. Germans and Australians are also in the process of inducting these in their sectors of operations.

Soon after induction into the IAF, the Indian Army and Indian Navy also bought similar platforms enabling commonality in training, sharing of infrastructure and maintenance which is to be accorded by Hindustan Aeronautics Limited (HAL). However, approaching only one vendor for the entire requirement risks certain pitfalls. The vendor has used the Indian experience for initiating some of the

upgrades which have been incremental, resulting in continuous investment in cost, down-time and retraining of the crew. While the newer payloads are also useful in Electromagnetic Intelligence and Communications Intelligence roles, there is an urgent need to arm the UAVs with Hellfire type of missiles. Use of satellite communication links are also required to provide wider footprints and redundancy against spoofing.

Most UAV manufacturers are developing payloads and synergetic support systems for non-military applications, including counter-terrorism operations, disaster management, border and urban surveillance, ground and sea traffic monitoring, crop diagnosis, ground mapping to name a few. With micro and nanotechnologies developing rapidly their applications in both military and civil UAV are also being worked upon. The Indian Coast Guard and the Coastal Police could also use UAVs for monitoring the threats emanating from the sea as was the case in 26/11 in Mumbai. Of course, the UAVs must be in conjunction with other surveillance systems, such as satellites, aerostats and the manned aircraft.

TECHNOLOGY PROMISES & PITFALLS

Unmanned Systems, as expected, are technology intensive and, therefore, their exploitation also poses a number of challenges. With the anticipated expansion of UAV fleet these will need to be addressed holistically. Some of these are human resource management, inter-operability with other platforms, standardisation of unmanned systems, communications, Network Centric Operations and Air Traffic Management, to name a few. While the human resource management issue needs to pay attention to motivation and career progression, other issues can be addressed by adapting better technology. Nonetheless, these aspects do need a comprehensive solution.

According to USAF statistics, Predator and Reaper drones have suffered at least 85 'Cat I/II mishaps', with typically 14 accidents taking place every 100,000 hours of flying. Drones are more glitch-prone than the traditional manned aircraft. Communications link loss with their remote stations is a regular complaint, forcing the UAV into automatic holding patterns. The unmanned planes also cannot handle rain, snow, heavy clouds, or high winds. Landing the aircraft, especially under inclement conditions needs great skill. That is why many UAVs also incorporate Automatic Take-off and Landing Systems. The Indian Army has introduced such a system with the IAF soon to follow. This will also somewhat compensate the shortages of external pilots in this field.

Increasing number of such platforms raises the question of airspace management. One of the major causes of accidents over Afghanistan has been losses due to collisions with smaller, low-flying UAVs. Israel also had to pay special attention to this aspect during their war in 2006 against Hezbollah in Lebanon, which witnessed crowded skies with combat aircraft, helicopters and UAVs generating over 400 sorties a day in a small area of opera-

tions. Some of the countries have, therefore, incorporated IFF (Identification Friend or Foe) on these Drones for airspace management, an aspect the IAF needs to also consider expeditiously. The aspect of mid-air collision is extremely important in terms of the Airspace Management and needs discussion with the other services and the Directorate General Civil Aviation.

INDIGENOUS EFFORTS

As regards the indigenous programmes, the IAF has used remotely operated targeting drone Chakor, an improved version of the Northrop Chucker RPV, in early 1980s. However, the Defence Research and Development Organisation (DRDO) derivative named Lakshya suffers from delayed deliveries and has not measured up to the desired quality, especially for practice firing of Beyond Visual Range missiles. On the other hand, another catapult launched UAV named Nishant is making good progress with a new Wankel engine. This could pave way to an advanced version named Gagan, which will also carry a SAR payload. DRDO had started a mini UAV programme in 1985 called Kapothaka, which had shown some encouraging results.

Unfortunately, the maiden flight of the DRDO-made Rustom medium altitude long endurance UAV failed on November 16, 2009, soon after take-off. But that should not act as a dampener. With no loss of on-board crew and marginal investment compared to a manned aircraft, for proving the

The next generation of UAVs would be designed to provide covert capability, carry more munitions, and operate at faster repositioning speeds to improve flexibility and survivability

basic fly-worthiness of the platform, UAV developmental programmes are very cost-effective. There is a need for the DRDO, National Aerospace Laboratories and HAL to pool in designing resources to ensure a focussed developmental project for Mini and Micro UAVs. It is time to also use the Indian Institutes of Technology and other technical institutions to foster innovation and encourage the private sector industries to market these platforms competitively.

Need of the hour is to get down to some serious implementation of India's current as well as future in-house programmes. Failure to catch the bus now could well precipitate a repeat of other delayed aviation projects, like the Light Combat Aircraft or Intermediate Jet Trainer, ensuring that the Indian defence establishment is forever shackled to imports. **SP**

AXED: ON ACCOUNT OF RECURRENT ENGINE FAILURE, THE TWO-DECADE-OLD HPT-32 FLEET WAS ABRUPTLY GROUNDED IN AUGUST 2009

Woefully Inadequate

As operational capability is founded on the attributes of the trainer fleet, it is imperative that the IAF allocate due priority to this segment of infrastructure

NOT LONG AGO, THE COMPTROLLER and Auditor General (CAG) of India had in a report observed that the Indian Air Force (IAF) lacked adequate numbers of state-of-the-art training aircraft which had an adverse effect on the quality of training imparted to budding military pilots. In the long term, this situation would lower proficiency levels and ultimately erode the operational potential of the IAF.

The malaise observed by the CAG afflicts the fleet of aircraft currently employed in the basic, intermediate and advanced stages (Stage I, II & III) of flying training. Preoccupation with the acquisition of the latest generation of combat platforms and an array of force multipliers must not detract the imperative need to revamp the fleet of trainer aircraft in the IAF.

By Air Marshal (Retd)
B.K. Pandey



BASIC TRAINER AIRCRAFT

The Hindustan Aeronautics Limited (HAL) built piston engine Hindustan Trainer-2, employed for Stage I in the IAF for nearly four decades, was replaced by the Hindustan Piston Trainer 32 (HPT-32) in the late 1980s. Inducted after a long and arduous history of development and only after the parameters stipulated in the Air Staff Requirements were watered down by Air Headquarters, the fleet of over 120 HPT-32 aircraft has had a dubious record of service as the primary trainer spanning the last two decades. The problem has centered primarily around an unidentified flaw in the integration of the proven Avco Lycoming AEIO-540-D4B5 engine with the indigenously designed airframe.

Despite a number of studies, modifications and alterations in maintenance/operating procedures, instances of engine stoppage in flight continued to occur with disturbing regularity.

Finally, in August 2009, after losing 17 aircraft, 19 pilots and Rs 16 crore on account of recurrent engine failure and in deference to opinion of the CAG that “the HPT-32 was technologically outdated and beset by flight safety hazards”, the two-decade-old fleet was abruptly grounded, leaving the IAF without a piston engine aircraft for Stage I and a training schedule in complete disarray. The Kiran fleet is not large enough to take on Stage-I training task on a regular basis. Clearly the IAF has a major crisis on its hands with no easy or quick solutions.

In response to the crisis, HAL has floated a Request For Information (RFI) to Raytheon for T-6 Texan, Finmeccanica for M-311, Pilatus for the PC-21, Grob for the G-120 TP, Korea Aerospace Industries for KT-1 and Embraer for the famous and widely used Tucano turboprop trainer aircraft. In collaboration with the selected partner, HAL will design and manufacture a replacement for the HPT-32 and make available the aircraft for induction into the IAF in a few years after the project is accorded government sanction. HAL hopes to finalise collaboration arrangements and design of the new trainer by March this year. The qualitative requirements spelt out by the IAF include a trainer with good spin characteristics, a proven turboprop engine, an ejection seat, a glass cockpit, retractable undercarriage, modern navigational equipment including global positioning system.

As the time frame of a few years linked with the offer by HAL would not help the IAF to tide over the current crisis, the Indian Ministry of Defence has approved off-the-shelf purchase of up to 80 trainer aircraft as an immediate and ready solution to extricate the IAF from the largely self created morass. However, if the HAL adopts a design which is different from the one acquired off-the-shelf, the IAF could find itself saddled with two different types of aircraft for Stage I training. Altogether this would be an undesirable situation as the cure could be worse than the disease and hence such a situation is best avoided. Besides, a totally indigenous effort by HAL could be fraught with uncertainties leading to delays and thus aggravating the plight of the IAF.

INTERMEDIATE JET TRAINER

The Intermediate Jet Trainer (IJT), or HJT-36 (christened “Sitara”), has been developed by HAL to replace the HJT-16 Kiran fleet for Stage-II training. Induction of the Kiran fleet had begun in the early 1970s and the aircraft has been in service for nearly four decades. However, it is rapidly approaching the end of its technical life and the fleet strength has been shrinking with the IAF losing two to three aircraft every year. Besides, over the last 10 years, there have been 13 fatal crashes on the Kiran fleet.

Sanctioned in 1999, the pace of development of the IJT in the initial stages was impressive as it took only 20 months from metal cutting to maiden flight, a feat remarkable by any standards. Since then, the prototypes of the IJT have been flying with the Larzac engine from Snecma but the production models are to be powered by a customised AL 551 engine supplied by the Russian NPO-Saturn.

The IAF was to receive the first batch of IJTs in 2005-06; but the schedule has lagged behind by several years necessitating extension of the life of the ageing Kiran fleet. HAL now has an order for 12 Limited Series Production of the IJT expected to be delivered to the IAF in 2010. However, reports in the media indicate that the prototype fitted with the

AL 551 engine has encountered some problems. Although not very serious in nature, such problems could have a cascading effect and push deadlines for operational clearance further aggravating the discomfort for the IAF as the Kiran fleet continues to dwindle.

The total order for the IJT is to be in the region of 225, of which HAL has already been tasked to produce 60. The time frame for execution of this order cannot be stated with any certainty.

ADVANCED JET TRAINER FLEET

Negotiated over two decades with BAE, India finally in 2004 sealed a \$1.6 billion (Rs 7,200 crore) contract for 66 Hawk Advanced Jet Trainers with an option for additional 40 for the IAF and 17 for the Indian Navy. While the IAF has received 24 aircraft in fly-away condition, of the remaining 42 to be assembled by HAL through transfer of technology, up to the end of 2009, only five were delivered as against the expected 25.

The IAF is once again confronted with a serious problem with regard to its trainer fleet. Today, it is woefully short of Advanced Jet Trainers (AJTs) for Stage-III training during which budding fighter pilots get the first exposure to combat flying. As things stand, the Hawk project does not appear to be moving forward at the desired pace having got caught in the cross-fire between HAL and BAE. Apart from other reasons, there appears to be disagreement over the price for fresh orders as well. According to reports in the media, the IAF also is not completely satisfied with the product support made available so far.

Given the difficult situation, option for follow-on orders is unlikely to materialise. To address the urgency of the requirement for AJTs, it appears that India is exploring other options for fast track acquisition of 57 aircraft for the augmentation of the Hawk AJT fleet. In April 2009, RFI for the new batch of 57 AJTs was sent to Italy's Alenia for the M-346, Korean T-50, the Aero Vodochody L-159, Russian Yak-130 and MiG-AT Trainer. Surprisingly, despite the track record so far, BAE is also a recipient of the RFI for an upgraded version of the Hawk AJT. If the tender for additional AJTs is not won by BAE, once again, the IAF could end up with two different types of trainer aircraft for the advanced stage of training. Though not the ideal solution, the IAF perhaps is left with no other option.

While the IAF is scouting for AJTs with foreign vendors, HAL has initiated a project for the development of an indigenous AJT to be positioned between the Hawk and the Tejas in terms of size and weight. Designated as the Combat Air Trainer (CAT), it will be of all-composite construction, twin-engine configuration with a glass cockpit, modern avionics, capable of transonic speed and will have a secondary combat capability. HAL is in dialogue with Snecma for an advanced version of their Larzac engine to power the HAL CAT.

As operational capability is founded on the attributes of the trainer fleet, it is imperative that the IAF allocate due priority to this segment of infrastructure in its overall drive towards modernisation. However, it is also necessary for the Indian aerospace industry to keep pace with the evolving requirements and growing ambitions of the IAF. In the final analysis, not much can be achieved without speedy and rational decision-making at the top levels of military, bureaucratic and political leadership. SP

TIME

to make Hay

DOWN WITH A THUD:
IN OCTOBER LAST
YEAR, MDLR STOPPED
FLYING AFTER RUNNING
UP HEAVY LOSSES



Encouraged by the throngs of travellers, half a dozen prospective regional carriers are planning to begin operations in the first half of this year

HOW MANY REGIONAL AIRLINES were in operation over India's vast territory at the beginning of this year? None. Indeed, the results of the country's regional aviation initiative, two-and-a-half years down the line, have been lacklustre. The policy was designed to encourage airline start-ups link small cities and towns and complement the operations of the national carriers.

Regional airlines are fairly successful in other parts, most notably in the US, where such carriers, operating as part of a "hub-and-spokes" architecture, efficiently ferry travellers to the nearest large airport from where the national airlines convey them speedily to distant destinations. Compared with large jetliners, regional aircraft generally have lower specific fuel consumption, higher

By Group Captain (Retd)
Joseph Noronha, Goa



power-to-weight ratio and improved short-field performance. Turboprops, or even purely propeller-driven planes—which typically consume a quarter to a third less fuel than equivalent jets—are tailor-made for the role. And since demand may not be enough to fill

large aircraft, it makes economic sense to deploy fuel-efficient 50 to 80 seat turboprops.

A REGIONAL APPROACH

All this fits in nicely with India's regional airline policy introduced in August 2007. According to Directorate General of Civil Aviation (DGCA) guidelines, a regional airline is a scheduled carrier that can operate within one of five geographical regions—north, south, west, east and the Northeast. It was appreciated that airlines operating off the

beaten track need sweeteners to be economically viable. Therefore, the government earlier laid down that landing and airport parking charges would be waived for aircraft with a seating capacity of less than 80 passengers. Aircraft that meet this criterion include the Alenia ATR 72, Embraer E-170, Bombardier CRJ-700 and BAe 146/Avro RJ.

As an additional incentive, small aircraft were charged at reduced rates for route navigation and terminal navigation facilities. But the most attractive concession was a uniform sales tax of just four per cent on aviation fuel, across the country, for aircraft with a take-off mass not exceeding 40,000 kg. Heavier aircraft, in comparison, are taxed at rates which vary by state and can reach the punishing heights of 30 per cent. Considering that fuel constitutes 40 per cent or more of an airline's operating cost, this lower sales tax is an advantage not to be sneezed at.

There was a flurry of interest in response to the new

carried 445.13 lakh passengers in 2009, against 412.71 lakh in 2008, marking a positive growth of 7.86 per cent. After totting up heavy losses, the private domestic airlines are expected to make a combined profit of \$250 million to \$300 million (Rs 1,160 crore to Rs 1,390 crore) in the fiscal ending March 2011, according to consulting firm Centre for Asia Pacific Aviation (CAPA). It will, however, take them some years to be rid of accumulated losses.

A wave of optimism is beginning to flow through the industry which even Delhi's dismal winter weather cannot dispel. Encouraged by the throngs of travellers, half a dozen prospective regional carriers are planning to begin operations in the first half of this year. Since the Indian airline industry (with the notable exception of Paramount Airways) now seems firmly ensconced in the low-cost camp, most start-ups will probably emerge as low-cost carriers (LCCs). MDLR Airlines is working out a revival plan and could re-



policy. But then the global economic downturn struck. Several companies that were granted initial NOCs to launch regional airlines did not take adequate steps to obtain the Scheduled Operator's Permit and commence operations within the stipulated 18 months; hence their permissions lapsed. In the North, Gurgaon-based MDLR Airlines with its three BAe 146/Avro RJ70 aircraft was the only carrier to commence operations as a regional airline. But in October last year it stopped flying until further notice after running up heavy losses. Jagson Airlines, also based in Delhi, acquired a licence to operate as a scheduled regional airline, but in the face of dipping passenger numbers decided to operate as a non-scheduled one. In the South, expectations ran high that Chennai-based Star Aviation would launch scheduled services on its Embraer 170 jets in early 2009; it has yet to get off the ground.

HOPE SPRINGS ETERNAL

However, the airline industry is again beginning to look up after many months in the doldrums. Domestic airlines

CLIPPED WINGS: PERHAPS THE BIGGEST CONSTRAINT IS THE GOVERNMENT'S ROUTE DISPERSAL NORMS

some flights shortly. There are reports that Jagson Airlines might commence operations as a scheduled regional airline from February 15. Star Aviation has sought an extension till June to commence operations. In three months, Luan Airways, a full service start-up regional airline, is expected to launch scheduled services ex-Surat. In addition, three regional carriers from Uttarakhand, Orissa and the Northeast are likely to sally forth. The travails of the existing airlines seem to have imposed caution on these new players; hence some may test the waters as non-scheduled operators that do not publish timetables, before going mainline.

MID-COURSE CORRECTION

To assume that regional airlines are down in the dumps solely because of the economic downturn could be a mistake. There are other important reasons as well. For instance, is a single-aircraft airline at all viable? The policy allows a carrier to begin with just one aircraft, but specifies it should operate with three aircraft within one year and five aircraft by the end of two years. It stipulates that for aircraft

of take-off mass up to 40,000 kg, the paid-up capital needs to be just Rs 12 crore for three aircraft. However, experience has shown that players with scant expertise in this highly competitive field sometimes rush in to launch an airline, only to retire hurt. Or, having burnt their fingers, they plead for the airline to be bailed out. The chances of such turmoil could be reduced by requiring operators to start with a minimum of perhaps three aircraft and suitably enhanced capital norms.

Regional airlines generally count on high-yield traffic in low-density markets. Although they have fewer seats and higher seat costs, they can fly higher loads and often charge higher fares than national carriers. But in India, regional airlines would be in direct competition with the established airlines. Can a small start-up really compete on equal terms with the likes of Jet Airways, Air India and Kingfisher Airlines? Instead of regional airlines, today full-service carriers are enjoying the specified concessions by deploying smaller aircraft like the ATR 72. While Kingfisher has 28 ATRs, Jet has 14. The Airports Authority of India (AAI) is clearly unhappy with this state of affairs. Having created airport infrastructure at considerable cost, how can it hope to recover its investment unless airlines pay landing and parking charges? The AAI recently requested a review of the policy of rebate for smaller aircraft, in order that only genuine regional carriers might benefit, and connectivity to remote areas should be effectively promoted.

The Indian government has an ambitious target—500 airports countrywide by 2020. This figure includes renovated airports, greenfield airports, new merchant and low-cost airports as well as airports dedicated to movement of cargo and logistics. According to Union Minister for Civil Aviation Praful Patel, more than 40 new airports are slated for construction over the next decade. Prospective regional airlines are keenly watching the progress since the success of their plans is intimately tied up with enhanced airport infrastructure. However, shortage of finance seems to be adversely affecting the ongoing modernisation work at 35 non-metro airports. This is a pity, because if regional airlines are to succeed in taking aviation to the remotest reaches, a time-bound programme to build or renovate perhaps a couple of hundred outlying airports is crucial. Regional airports would probably attract just one or two flights per day. Therefore, low-cost airports for use by LCCs flying smaller aircraft are a necessity. A typical no-frills airport can be built for around Rs 50 crore. Such an airport would have a single runway and a basic terminal building with essential air traffic control and night-landing facilities. To be economically viable, however, it would need to generate high levels of non-aeronautical revenue.

Perhaps the biggest constraint to the successful operation of regional airlines is the government's route dispersal norms. It is mandatory for scheduled carriers to deploy a specified percentage of their capacity on Category II and III routes such as Jammu and Kashmir and the Northeast. The laudable intent is to extend the benefits of air services to poorly connected cities and towns. The policy has been successful in ensuring con-



THE BIG FISH: INSTEAD OF REGIONAL AIRLINES, TODAY FULL-SERVICE CARRIERS ENJOY CONCESSIONS BY DEPLOYING SMALLER AIRCRAFT

nectivity to many less-developed regions. But it has exacted a high price by way of excess capacity and inefficient utilisation of expensive resources. The major airlines, generally operating large aircraft, find

these routes loss-making since they do not generate sufficient passengers. A gradual withdrawal of the route dispersal policy would enable regional airlines to operate smaller aircraft more efficiently in the space vacated by the national carriers.

READY FOR TAKE-OFF

With the economy again poised for high growth, and passenger numbers soaring, the time is probably ripe for new regional airlines—at least one in each region—to take the plunge. In the last two years domestic carriers ran up huge losses mainly because of over-capacity and intense competition. However, Tier-2 and Tier-3 cities and towns across India continue to be neglected. Now that passengers are again eager to fly, CAPA predicts 15 per cent growth in domestic traffic for the FY 2010-11. It believes India could be the world's strongest passenger growth market for the next 10 to 15 years. Considering that just two per cent of Indians currently travel by air there is vast scope for growth. This is not to say that airlines should throw caution to the winds. A return to the days of unbridled hyper-competition in order to corner market share could cause more damage to the industry.

The Ministry of Civil Aviation's *Vision 2020* document envisages about 280 million international and domestic passengers by the year 2020. Other estimates range as high as 400 million. The six largest airports, which currently handle over 70 per cent of the national traffic, cannot deal with such enormous numbers. Nor can the fixated-on-metros national carriers. All stakeholders would benefit if the growth were distributed. And regional airlines have a crucial role to play by connecting hitherto neglected population centres that have some tourist or business potential. As many as 200 cities and towns across the country have enough population to support regular air services. Many of these are fast developing into hubs of economic activity. They are crying out for air connectivity. Could this be an opportunity going a-begging? If there's a "must read" for India's regional airline decision makers it probably is C.K. Pralad's *The Fortune at the Bottom of the Pyramid*. SP



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BALANCING ACT: THE PRESSURE ON TECHNOLOGY SHOULD BE ON DETECTING—THROUGH PROFILING—BEHAVIOURAL TRAITS AND/OR ANALYSIS OF DATA

Airport security measures must be pro-active and must anticipate every possible move the “terrorist” could make—if airports and passengers are to be kept secure. The question is how?

POST 9/11 AIRPORT SECURITY has been perceived quite differently, triggering the abrupt rise in apprehension levels and airport security thresholds. Since then, the see-saw struggle between airport security machineries around the world, and the “terrorist”—seen as a collective entity bent on breaching airport security defences—has continued unabated. The latest reminder that this struggle is unending was the 2009 Christmas Day event in which a Nigerian “terrorist”, Umar Farouk Abdulmutallab, attempted to blow up a Northwest Airlines flight on way from Amsterdam in the Netherlands to Detroit in the US. Twenty three-year-old Umar had an explosive device sewn into his undergarments, and was prevented from detonating the device, just short of landing at Detroit, by the passengers and crew of the flight.

By Our Staff
Correspondent



Had Umar succeeded in his dastardly plan, at least 300 lives would have been lost; the toll could possibly have been much larger had the aircraft crashed into an inhabited area (Osama bin Laden later claimed responsibility for the failed attempt in an audio tape aired by Al Jazeera channel). President Barack Obama was left defenceless and had to admit that the incident had been the result of a “systemic failure” in security as US intelligence agencies failed to detect the “red flags” that would have placed Umar on the ‘no-fly’ list. He admitted that information which could have prevented Umar from getting into the plane had not received the attention it deserved. The President went on to admit that the US government “failed to heed warnings”. Expectedly, in the aftermath of the incident, airport security machineries across the globe embarked on feverish reactive actions—some of which are being debated.

Immediately after the incident, the US announced that passengers flying from (or transiting through) at least 14 countries—listed by Washington under either “state sponsors of terrorism” or “other countries of interest”—will be subject to additional security screening at airports from which they board US-bound flights. Visitors from these countries, including Nigeria, Pakistan and Yemen, will be “patted down” and all their hand baggage searched before boarding. The Transportation Security Administration (TSA), the agency responsible for security in all modes of transportation in the US, added that the new directives on enhanced security screening will increase the use of relevant technologies.

FULL BODY SCANNING

Frenetic activity and heated debate currently centres on full body scanning or Whole Body Imaging—a controversial security measure using different technologies. Full body scanners include backscatter, X-ray, thermal and millimeter wave technologies, each of which have challenges associated with explosive detection. Backscatter Passenger Imaging uses low intensity X-ray technology; an example is the Rapiscan system which works by bouncing X-rays off an individual’s skin to produce an outline image of the person’s body and shows items stowed in pockets or concealed on the person.

Millimeter Wave Technology, on the other hand, involves projecting radio frequency energy over the passenger’s body creating a 3-D image and revealing the smallest concealed item. Iscon Video Imaging’s proprietary thermal-boosted infrared detection technology shows objects and clothing without any harmful radiation by detecting the temperature differential between clothes and a hidden object. In comparison, a door frame metal detector or a hand-held metal detector can find out only objects made of metal. The debate on the use of these full body scanning technologies stems from the fact that the images from both systems render the subject more or less unclad to the viewer.

Full body scanners provide security officers with a naked image of the passenger being scanned, in the hope of spotting any potentially dangerous substance concealed on that person that escaped metal detectors. The scanners will not detect substances hidden in a body cavity, and experts disagree on whether the technology would have seen the powder Umar is accused of concealing in his underwear. Officials in many other countries are resisting adding the scanners in their airports, mostly citing privacy concerns.

In the US, groups such as the Electronic Privacy Information Center oppose full body scans, and the American Civil Liberties Union calls them a “virtual strip search”. Scanners minimise tactile pat down contact between the security officers and the passengers. Thus, using new full body scanners reduce the time it takes to screen people. It takes only two seconds to reveal and pinpoint a hidden object on a human’s body. However, many places have not been using these full body scanners due to the fact that it shows a perfect outline of the passenger’s private areas. The use of these scanners not found acceptance in some places on children due to child pornography laws. The protagonists for these technologies argue that both systems can have security blocks built in that prevent the recording or storage of an image and that the images are rendered unrecognisable, thus prevent misuse of the equipment.

PRIVACY VS PRACTICALITY

However, even in the US, there is a problem in introducing whole body imaging at all the airports. In June 2009, the US House of Representatives voted 310 to 118 to pass a measure that prohibits the TSA from using full body imaging as a primary means for screening passengers. Some security experts, on the other hand, feel that privacy concerns notwithstanding, these machines, which offer anatomically correct images of the human body, should now be deployed as the primary scanning technology at airports. The system was originally considered a secondary security measure, but

the TSA has tested full body imaging at Salt Lake City and other airports across the country.

Opinion polls conducted since Christmas in the US suggest that a majority of Americans would give up their civil liberties for better air safety; it is yet to be seen what will be the result of a policy that requires every air traveller in the US to be subjected to full body scans or pat downs. It is worth noting that some polls also said a majority would support ethnic profiling as a security measure—a practice that is indefensible on many levels in a democracy. While US Homeland Security plans to add 300 scanners across the US this

With heightened terror threat on civil aviation the world over, IATA has asked governments to harmonise security laws and procedures, upgrade screening technologies and share passenger data to identify those wanted



year, that will still leave about 500 US airport checkpoints without the technology.

Meanwhile, London’s Heathrow Airport, possibly the busiest in Europe, has introduced full body scanners to check passengers as a part of the airport’s latest efforts to step up security in the aftermath of the Northwest flight incident as British authorities reached the conclusion that the kind of explosive used by Umar could not be identifiable by ordinary screening machines. The Netherlands also announced that full body scanners will be used to screen the passengers on all US-bound flights departing from Schiphol Airport in Amsterdam. Israel already uses full body scanners at some of its airports. Some of the member-nations of the European Union (EU) as well as Japan are preparing to use full body scanners at airports. Interestingly, one airport

in Russia, the Moscow Domodedovo Airport, the largest one in all of Russia, has been successfully using these full body scanners for nearly three years already. Its market shares in total passenger traffic in Moscow make up 46 per cent. Currently, 78 partner airlines, 34 foreign, 28 Russian, and 16 from the CIS make up connecting flights to over 220 destinations. Thus, in 2009, some 19 million passengers passed through Domodedovo's whole body scanners which helped keep security lines short. The protests, if any, were below the media's aural threshold levels.

INDIA FOLLOWS SUIT

Back home, the Indian government has decided to set up full body scanners at airports across India in a phased manner in order to step up security against potential terror attacks. The proposal to introduce full body scanners at airports in India has been cleared by a technical specification committee formed by the Ministry of Civil Aviation. The Intelligence Bureau (IB) had conducted a comprehensive review of security at airports in India, in the aftermath of the incident that occurred in the US on Christmas Day.

Following the review, the IB had conveyed to the Ministry of Home Affairs the "urgent need" to introduce full body scanners since these are the only foolproof way to prevent recurrence of such attempts by terrorists. According to reports, the review by the IB was also prompted by the US decision to send its officials to countries all over the world to review security conditions at airports. Last month, the Bureau of Civil Aviation Security (BCAS) had issued a security alert to airlines and airports in India, calling for extra vigilance. The alert came close on the heels of a meeting of the Cabinet Committee on Security, which discussed security at airports and of airlines in view of the incident on the Northwest Airlines flight. This concern was all the more serious as at a meeting conducted by International Air Transport Association (IATA) last month in Geneva, a high security alert was issued to all Indian airports and airlines, including Air India, following intelligence inputs that Pakistan-based Lashkar-e-Toiba and al-Qaeda terrorists were plotting to hijack an Indian plane in the region.

With heightened terror threat on civil aviation the world over, IATA has asked governments to harmonise security laws and procedures, upgrade screening technologies and share passenger data to identify those wanted. In line with the IATA appeal, India and the US recently set up a Joint Working Group of officials of the Transportation Security Administration and the BCAS to standardise security procedures, including laying down parameters for deployment of sky marshals on flights between the two countries and transfer of security-related technology.

DETECTION ALONE NOT A DETERRENT

The clamour for improved technologies is scoffed at by some. According to Airports Council International Europe Director General Olivier Jankovec, "Focusing exclusively on detection at the airport is not the way forward. Effective analysis and sharing of security information as well as passenger profiling, will play a crucial role." Indeed, the perpetrators of 9/11 did not carry any prohibited items on to the airplanes. Perhaps, the pressure on technology should be on detecting—through profiling—behavioural traits and/or analysis of data, which in-

dicates a need for closer surveillance, examination and investigation of individuals. The basic presumption driving these new technologies should be that a person about to commit a crime would behave differently from someone going for an airplane ride, especially in the case of suicide bombers. This leaves us with applying technology, behavioral science and intelligence analysis to vet the traveling public.

To identify dangerous people, the TSA has stationed specially trained behavior detection officers at 161 US airports. The officers are trained to spot suspicious behavior; last year, officers nationwide required 98,805 passengers to undergo additional screenings, police questioned 9,854 of them and arrested 813. The observation of passengers does not end in the airport. On an undisclosed number of domestic and international flights, federal air marshals pick up where the behavior detection officers leave off. If a passenger causes trouble, air marshals have several options. They can ask crew members to help subdue a person. They can wait until the plane lands and call for backup. Or they can draw their weapons.

Moving away from passengers, the other area of concern is cargo. While a passenger and his baggage are subjected to strict scrutiny, security checks on cargo carried on board passenger and cargo aircraft is comparatively lax. In the US, a federally-mandated August 2010 deadline is fast approaching requiring all cargo carried on passenger planes be screened for explosive threats. The TSA has emphasised the need for the screening to be done—whether by physical or technological means—throughout the supply chain, in particular by freight forwarders.

INDIAN AIRPORTS VULNERABLE & POROUS

In India, the cargo security regulatory mechanism is even more lax. Air cargo is vulnerable and it is easy for a terrorist to sneak a bomb into any of the tens of thousands of cargo packages carried each day in the cargo compartments of passenger planes. Many workers who handle cargo are neither checked out nor trained to the extent security staff handling passengers and baggage at airports are.

Yet another vulnerability of Indian airports is that while the passenger and his baggage appearing is subjected to intense screening activity prior to boarding a commercial flight, the security arrangements at smaller, remote airports/airstrips is minimal for a person boarding a small private airplane. All a determined terrorist has to do is to carry a packet of plastic explosives from a small airstrip in a small private airplane and land in Mumbai. Further, for "beating the system", a terrorist could just park a car in the airport with its boot full of explosives, unleashing severe mayhem and claiming many lives.

As mentioned earlier, the struggle between the terrorist and the airport security is perpetual—with airport security being more on the reactive and the terrorist mostly retaining the initiative. The next logical conclusion is that airport security measures must be pro-active and must anticipate every possible move the "terrorist" could make—if airports and passengers are to be kept secure. The question is how? The recent overtures at governmental level, including in the US, European and other states, in the form of data and information exchange, are thus a welcome fall out of the Christmas explosive incident. SP

COUNT FERDINAND VON ZEPPELIN (Ferdinand Adolf Heinrich August Graf von Zeppelin) was born on July 8, 1838, in Baden, Germany. He

joined the German Army at 20. His first balloon flight occurred in 1863, in Minnesota, while on deputation in the US. It made a deep impression on him. He retired from the army in 1890 over a professional difference of opinion, albeit with the rank of Generalleutnant. Early retirement proved a boon—he was now able to devote himself fully to the design and construction of airships.

Zeppelin established an airship factory using his own money and, by 1898, with a team of 30 workers, he assembled his first airship, the *Luftschiff Zeppelin 1* (LZ-1). After the Montgolfier Brothers' pioneering balloon ascent in 1783, balloon flights had become commonplace. Zeppelin's contribution was to enclose several hydrogen-filled gasbags in a steel skeleton, thus imparting strength and rigidity to the contraption, and to make it "dirigible" (that can be directed or steered). The zeppelin consisted of a row of 17 gas cells individually covered in rubberised cloth. The whole structure was confined in a cylindrical framework covered with smooth-surfaced cotton cloth. It was about 420 ft long and 38 ft in diameter. It weighed 12 tonnes and contained about 400,000 cubic feet of hydrogen. The airship was steered by forward and aft rudders and was driven by two 15-hp Daimler internal-combustion engines, each turning two propellers. Passengers, crew and engine were carried in two aluminium gondolas suspended forward and aft. The LZ-1, with five occupants, successfully completed its maiden flight on July 2, 1900. It attained an altitude of 1,300 ft and covered a distance of 3.75 miles in 17 minutes.

In 1908, Zeppelin ran out of money, but the Germans contributed generously to keep him going. On November 16, 1909, the world's first airline was founded—the *Deutsche Luftschiffahrts Aktien-Gesellschaft* (DELAG). By 1914, DELAG had transported 37,250 people on over 1,600 zeppelin flights without an incident. It was a remarkable safety record considering that zeppelins used

highly flammable hydrogen gas. Helium, being inert, was known to be much safer. But its use did not become widespread till many years later on account of its scarcity and prohibitive cost.



FERDINAND GRAF VON ZEPPELIN (1838 – 1917)

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Zeppelin was a military man, not a businessman. Being a German aristocrat, he viewed the idea of carrying passengers to make money as unworthy of his airships, and of himself. He wanted, instead, to contribute to his country's military strength. He was frustrated and disheartened by the lack of enthusiasm in

the technology displayed by the German Army and Navy. Matters came to a head following the September 1913 crash of a naval zeppelin (LZ-14) off the coast of Heligoland, in which 14 men died (the

first deaths in any zeppelin accident). Zeppelin gradually began to withdraw from active involvement with airships.

At the outbreak of World War I, the German Army owned seven zeppelins. Equipped with five machine-guns and a 2,000 kg bomb load, these had a maximum speed of 136 km/hour and could reach a height of 4,250 m. Some were used to bomb London. But zeppelins were too slow and explosive a target in wartime and too fragile to withstand stormy weather. About 40 were shot down over London.

Zeppelins achieved their pinnacle of commercial success long after the war. The famous LZ-127 *Graf Zeppelin* flew more than a million miles through 590 flights, transporting over 34,000 passengers without a single injury. During its nine-year career, it made the first commercial passenger flight across the Atlantic, the first commercial passenger flight around the world, a scientific mission over the North Pole and the first regularly scheduled transatlantic passenger crossings by air. However, safety problems that led to accidents, including the catastrophic crash of the zeppelin *Hindenburg* in 1937, brought an abrupt end to the saga.

Count Zeppelin died before the end of World War I, at age 78, on March 8, 1917, in Berlin. He was the first large-scale builder of the graceful airships which eventually became synonymous with his name. The birth and progress of heavier-than-air machines sounded the death knell of the zeppelins. Today, zeppelins may seem to be ponderous and obsolete contraptions. In future, soaring oil prices and green concerns could well bring about their resurrection as a cheap, efficient and scarcely polluting method of transporting large loads over short distances. SP

—Group Captain (Retd)
Joseph Noronha, Goa

MILITARY

Asia-Pacific

Boeing receives RFI for supply of six refuelling tankers to India



The Boeing Company has received initial Requests For Information (RFI) from the Indian government for the supply of six refuelling tankers. Earlier this month, the US government had received a letter of request from India's Ministry of Defence for acquisition of 10 C-17 Globemaster-III advanced air transporters. "We will do a detailed evaluation of the request for interest from the Indian government, study our inventory, and accordingly inform the government," Dr Vivek Lal, Vice President and Country Head of Defence and Space and Security at Boeing India, told reporters. Boeing estimates that likely Indian arms purchases could allow it to bid for deals worth about \$31 billion (Rs 1,43,730 crore) between 2009 and 2019. Likely deals could involve purchase of fighter and attack aircraft, heavy lift cargo aircraft, missiles, airborne early warning and training systems.

Gulf Region remains the nucleus of Middle East defence growth

The Middle East represents one of the world's most robust defence markets and should remain that way in the near future. The six countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) that make up the Gulf Cooperation Council (GCC) will account for roughly 60 percent of all defence expenditures made in the region in 2010, according to a recent Middle East military market analysis by Forecast International (FI). In 2010, these countries are

projected to invest over \$63 billion (Rs 2,92,100 crore) toward their armed forces and security, with two-thirds of that total contributed by Saudi Arabia alone. FI expects this trend will continue. Combined GCC defence spending is expected to rise in 2011 by an additional 2.5 per cent. Over the next five years, the greater Middle East defence market is projected to grow by over 11 per cent, reaching nearly \$120 billion (Rs 5,56,380 crore) by 2014. The seemingly unstoppable defence-spending binge by the Middle East and the GCC members has been fueled by their quest to close the strategic gap between themselves and regional rival Iran by acquiring superior military hardware and technologies.

US offers Pakistan drones to boost cooperation

The US will provide a dozen unarmed aerial spy drones to Pakistan for the first time as part of an effort to encourage Pakistan's cooperation in fighting Islamic militants on the Afghanistan border, American defence officials said. But Pakistani military leaders, rebuffing American pressure, said they planned no new offensives for at least six months. The Shadow drones, which are smaller than armed Predator drones, will be a significant upgrade in Pakistan's reconnaissance and surveillance ability and will supply video to help cue strikes from the ground or the air. Pakistan, which already has some limited surveillance ability, has long asked for drone technology from the US, arguing that it should have the same resources to watch and kill militants on its own soil as does the Central Intelligence Agency, which conducts regular drone strikes in Pakistan.

Successful flight trials of laser-guided bombs

Two flight trials have been conducted at the Integrated Test Range, Chandipur to test the effectiveness of the guidance and control systems of laser-guided bombs. On-board systems in both the trials worked satisfactorily and

the mission objectives have been met. Aeronautics Development Establishment (ADE), Bangalore has developed the guidance kit for 1,000 lb, laser guided bombs. These are designed to improve accuracy of air-to-ground bombing by Indian Air Force (IAF). A number of tests have been performed both through simulation and flight tests over the last few years to reach the required performance levels. The bomb, once released, by the mother aircraft at appropriate range, will seek the target and home on to it very accurately and with high reliability. All the necessary on-board components are sourced from Indian industry. Another Defence Research and Development Organisation (DRDO) laboratory, Instruments Research and Development Establishment, Dehradun, has partnered ADE in this project. IAF officers flew the aircraft and released the bombs as per prescribed standard operating procedures.

India, US discuss defence cooperation

US Secretary of Defence Robert N. Gates, accompanied by senior officials from the US Department of Defense (DoD), recently met Defence Minister A.K. Antony in Delhi. Both sides exchanged views and perspectives on a number of issues, including the regional security situation and global security challenges. Both expressed satisfaction about the improvement in bilateral defence relations since the signing of the bilateral cooperation agreement in 2005. Antony conveyed to the US Secretary of Defence India's concerns regarding denial of export licences for various defence-related requirement of the armed forces and also regarding the inclusion of some Indian defence PSUs and DRDO labs in the 'Entity List' of the US government. Antony expressed the view that such restrictions were anomalous in the context of the steady improvement in the bilateral defence relations between both countries. The US Secretary of Defence informed Antony that President

QuickRoundUp

ADS

- ADS, the UK's AeroSpace, Defence and Security trade organisation has marked its formal launch by publishing a new book and video highlighting the hugely positive impact that the industry makes in the form of £60 billion (Rs 4,42,670 crore) per year to the economy and 500,000 high-quality British jobs across all regions of the country.

AGUSTAWESTLAND

- AgustaWestland, a Finmeccanica company, has announced that the Finnish Border Guard has ordered a fourth AW119Ke single-engine helicopter. The Finnish Border Guard chose the AW119Ke in 2008 to sustain its fleet modernization and enhancement programme. All four helicopters will be used to perform various tasks including border patrol, special operations and fire fighting.

AIRBUS

- The China Southern Airlines Board has announced that the Company has entered into the Airbus Aircraft Acquisition Agreement with Airbus SNC to purchase 20 Airbus A320 Aircraft from Airbus SNC. The Acquisition is also subject to the approval of the relevant government authorities in the PRC.

- Airbus had a major presence at this year's Singapore Airshow, showcasing both its commercial and military transport products. The highlight was the first public presentation of the new A330-200F Freighter. The aircraft, which is currently undergoing its certification programme, will be on static display throughout the show. The new freighter is the latest addition to the highly successful A330 Family and will enter service later this year.

- Yemenia, the official carrier of the state of Yemen, based in Sanaa, has signed a firm contract to buy 10 A320 Family aircraft from Airbus. The agreement follows the Memorandum of Understanding (MoU) signed at the Dubai air show. The aircraft will replace Yemenia's existing fleet of Single Aisle and wide-body aircraft, enhance and expand their regional services to Gulf States, Middle East, Africa, India and Southern European destinations.

Barack Obama has initiated a comprehensive reform of US export control regulations and assured that this would involve facilitation in the supply of defence technology and equipment to India.

IAF Chief visits Bangladesh



During a recent goodwill visit to Bangladesh, Chief of the Air Staff (CAS) Air Chief Marshal P.V. Naik met the President of Republic of Bangladesh, Zillur Rahman, and the Prime Minister and Defence Minister, Sheikh Hasina Wajed. Naik also met the three Service Chiefs of Bangladesh's armed forces and had detailed interactions with Air Marshal S.M. Ziaur Rahman, CAS Bangladesh. Main focus of the visit was to improve bilateral relations, promote defence ties, outline further areas of defence cooperation between the two countries and to resolve pending issues through dialogue and understanding.

Eurofighter dominates fighter race in India, claims India's ambassador to Italy



India's Ambassador to Italy Arif Shahid Khan was quoted by Reuters news agency as saying that Eurofighter Typhoon is leading the race to win the new deal to acquire 126 aircraft for the IAF. Khan stressed on the top position held by Eurofighter Typhoon during a meeting with Italian Prime Minister Silvio Berlusconi in Rome. Flight trials of the six aircraft competing for

the tender are expected to be completed by April 2010 for comparative technical evaluation. Apart from Eurofighter's Typhoon, Dassault's Rafale, Saab's Gripen, Boeing's F/A-18 Super Hornet, Lockheed Martin's F-16 and Russia's MiG-35 are in the competition. The ambassador remarked that Germany's President Horst Köhler will visit India in early February, as will Silvio Berlusconi later this year.

Americas

Northrop Grumman's SABR successfully demonstrated on F-16



Northrop Grumman Corporation, in conjunction with the US Air Force (USAF), has successfully completed a series of demonstration flights of the Scalable Agile Beam Radar (SABR) installed in an F-16 fighter aircraft. The demonstration was in support of a USAF F-16 Active Electronically Scanned Array (AESA) feasibility study. SABR is an affordable and scalable AESA radar designed for retrofit in current F-16s and other legacy fighter, attack, and training aircraft. Compared to mechanically-scanned array radars, SABR will provide the increased performance, multi-functionality, and greater reliability inherent in AESA radars. In terms of combat capability, SABR provides improved situational awareness, greater detection, high-resolution SAR maps, interleaved air-to-air and air-to-surface mode operations, and an all-environment precision strike capability.

USAF Secretary unveils service's game plan in future security environment

USAF Secretary Michael Don-

ley, after giving an overview of the current and future geo-political and security environment, specified the tasks for the USAF. "The air force needs to remain vigilant in tying our work to the National Security Strategy, the Quadrennial Defense Review and other authoritative guidance that sets the direction for DoD and the larger national security community," he said. Secretary Donley stated that the presence of the USAF in regions of interest is critical to building partnerships and partner capacity along the way. "Engagement provides early warning and helps us understand the direction and pace of change through the eyes of potential adversaries and partners in the region." He added that continuous engagement also creates avenues for sharing perspectives of the strategic environment and opportunities to shape that environment in ways favorable to the US. Donley further described basing access as "the lifeblood" of a globally oriented air force as the service seeks the right balance between the forward stationing of US forces in key regions and periodic rotations and deployments.

Boeing begins A-10 Thunderbolt wing assembly for USAF

The Boeing Company has begun assembling the first A-10 Thunderbolt replacement-wing set at its Macon facility. The USAF awarded Boeing the contract, worth up to \$2 billion (Rs 9,275 crore), in June 2007 to provide as many as 242 A-10 replacement-wing sets through 2018. Boeing will deliver the replacement wing sets to Hill Air Force Base, Utah, in four parts: three wing sections and an installation kit. Air force personnel will install the wings. Boeing is scheduled to deliver the first wing set in September and up to 50 wing sets a year at peak production. The A-10 Thunderbolt, also known as the Warthog, is a twin-engine jet aircraft designed for close-air support of ground forces. More than 350 aircraft are currently in the US fleet

QuickRoundUp

ALENIA AERONAUTICA

- The Combined Air Power Transition Force in Afghanistan now uses three G.222/C-27A tactical airlifters overhauled and upgraded by Alenia Aeronautica in its facilities at Capodichino (Naples). The aircraft was completed in mid-December 2009 and was ferried by a USAF crew, entering service with the Afghanistan National Army Air Corps immediately upon arrival.

BAE SYSTEMS

- BAE Systems, in partnership with the National Oceanic and Atmospheric Administration, has completed the first successful test flight of its small, electric-powered Coyote unmanned aircraft system. The system deployed in midair from a 3-foot-long sonobuoy dropped from a P-3 aircraft.

- A full scale replica of BAE Systems' Mantis unmanned aircraft system (UAS) was on display at the Bahrain International Air Show. Mantis is a fully autonomous next generation UAS which can execute its mission with a much reduced need for human intervention by understanding and reacting to its environment. Mantis could carry out intelligence gathering at long distances and can carry significant payloads in terms of sensors and, potentially, weaponry. It will facilitate full integration with the UK's C4I infrastructure, significantly enhancing sovereign operational capabilities.

BOEING

- The Boeing Company has signed a contract with Italian defence company Oto Melara to co-produce the Small Diameter Bomb Increment I (SDB I) weapon system for the Italian Air Force. Under the terms of the contract, Boeing will provide major SDB I mechanical and electrical components and test equipment for production of 500 tactical weapons, 50 four-place weapon carriages, and associated support equipment. In addition, Boeing will provide technical assistance in establishing a production facility in Italy.

- Boeing Co., Seattle, has been awarded a contract which will provide the French Airborne Warning And Control System mid-life upgrade. The entire amount has been obligated.

APPOINTMENTS

INDIAN AIR FORCE

Air Marshal Joseph Neri took over as the new Air Officer-in-Charge Maintenance (AOM), on February 1 at Air Headquarters. In the new assignment he will be responsible for 'Maintenance Management' of all weapon systems and equipment of the IAF. He was formerly the Director General of Aircraft at Air HQ.

GULFSTREAM

Gulfstream Aerospace Corp. has named Dick Johnson Vice President/Chief Scientist. Johnson, a 29-year Gulfstream employee, was Vice President, Engineering, from 2003 to 2009. Gulfstream Aerospace Corp. has named Jeff Toline Director of Service at its Appleton, Wis., facility. Toline was general manager of the General Dynamics Aviation Services facility in Minneapolis from September 2006 to July 2009.

UNITED TECHNOLOGIES

On January 1, 2010 Louis Chênevert succeeded George David as the eighth Chairman of United Technologies. Chênevert joined UTC's Pratt & Whitney division in 1993, and served as President Pratt & Whitney from April 1999 through March 2006. He held the position of President and Chief Operating Officer, and served as a Director of United Technologies since March 2006. He was elected President and Chief Executive Officer in April 2008, and Chairman in January 2010.

NORTHROP GRUMMAN

Northrop Grumman Corporation has named Daniel W. Chang Vice President of Maritime and Tactical Systems programmes. Chang will be responsible for leading the company's efforts on the Littoral Combat Ship Mission Package Integration programme, its Airborne Mine Counter Measures programmes, and its maritime laser weapons programmes.

participating in both Iraq and Afghanistan operations.

Europe

Russia-India fighter makes successful maiden test flight

Russia's new Fifth Generation stealth fighter (FGFA), a joint project with India which is set to form the backbone of the two nations' air power till the mid-21st century, made a successful maiden test flight on January 29. The plane performed "very well" during a 47-minute flight at an airfield in the far eastern city of Komsomolsk-on-Amur and met "all our expectations," a spokesman for the Sukhoi Corporation, which designed the FGFA, said. The flight marked a breakthrough for Russia, making it the second country in the world after the US to have built a Fifth Generation fighter plane. The FGFA will also be a quantum jump for India as the first joint project with Russia where the Indian aviation industry will be a full-fledged partner.

Sagem wins French contract for Version 5 of the SLPRM Mission Planning System

In late December 2009, French defence procurement agency DGA announced the contract award to Sagem (Safran group) for the development and supply of SLPRM V5, including three years of system maintenance services. The SLPRM (Système Local de Préparation et de Restitution de Missions) mission planning and debriefing system, developed for the Rafale omni-role fighter, is a key to efficient mission planning and debriefing. It is used on different combat aircraft deployed by the French air force and navy, and supports all stores configurations. SLPRM integrates the latest Rafale F3 standard, as well as the latest guided air-to-ground weapons, including the ASMP-A nuclear cruise missile, Scalp conventional cruise missile and AASM modular air-to-ground weapon, developed and produced by Sagem, along with the Reco-NG optronics reconnaissance pod.

Sagem is also prime contractor for the mission planning system used by army helicopter crews, MPME (Moyens de Préparation de Missions pour Equipages d'hélicoptères or helicopter crew mission planning module). Both systems, SLPRM and MPME, are currently deployed by French forces in combat operations in Afghanistan.

RAF showcases war winning capability

The Tornado Force based at Royal Air Force (RAF) Marham has showcased its state-of-the-art technology being used to support ground forces in the Counter Insurgency and Counter Improvised Explosive Device (IED) campaigns. This top class intelligence and surveillance capability, along with the sophisticated weapons, is currently being used on the front line in Afghanistan by the Tornado GR4 fast jets. The Tornado Force has been patrolling the skies over Afghanistan in support of Operation Herrick since taking over from the Harrier Force in May last year.

The sophisticated capability of the Tornado and its surveillance technologies are playing a key role in Afghanistan by preventing mortar attacks on UK and International Forces. Its intelligence systems are also being used to search for IEDs, which is one of the largest threats to Allied forces.

INDUSTRY

Americas

Boeing reports strong 2009 revenue and cash flow due to good performance

The Boeing Company reported fourth-quarter net income of \$1.3 billion (Rs 6,028 crore), or \$1.75 per share, as revenue rose 42 per cent to \$17.9 billion (Rs 82,918 crore). Current period results reflect solid performance across core businesses and represent a significant improvement over the year-ago quarter, which included a labour strike and a charge on

QuickRoundUp

- The Boeing Company has announced that it has been awarded a five-year In-Service Support contract for Project Wedgetail, Australia's 737 Airborne Early Warning and Control (AEW&C) programme. Under the performance-based logistics contract from Australia's Defence Materiel Organisation, Boeing will provide acquisition, programme management, integration and engineering services.

CAE

- CAE has announced that it has sold Airbus A320 and A330 CAE 7000 Series full-flight simulators (FFS) to Shanghai Eastern Flight Training Company (SEFTC), the training subsidiary of China Eastern Airlines. The contract brings the total FFS sales that CAE has announced during fiscal year 2010 to 14.

ELBIT SYSTEMS LTD

- Elbit Systems Ltd has announced that it was awarded contracts to supply various types of laser-based systems to the Israeli Ministry of Defense and to North American customers. The Israeli MoD will be supplied with laser systems, while in North America; Elbit Systems will supply two different customers with airborne laser systems.

EMIRATES AIRLINE AND AIRBUS

- Emirates Airline and Airbus have achieved a major milestone by celebrating the delivery of the 6,000th aircraft in the airframe manufacturer's 40-year history. The aircraft, an A380, was handed over to Emirates Airline in a ceremony in Hamburg.

EUROCOPTER

- According to Mascle, Eurocopter Romania has completed the 50th delivery of an aircraft of the Puma and Super Puma family, with maintenance and capital repair works carried out in Brasov. Eurocopter Romania, Mascle added, has become the main global competence center of the Eurocopter Group for the maintenance of this helicopter family. Most orders come from military contracts won around the world: Africa, Europe, Middle East, South America and Asia.

EUROFIGHTER

- Major General Konstantin Popov, Head of the Bulgarian Air Forces

SHOW CALENDAR

15 February – 18 February
DEFEXPO INDIA 2010
 New Delhi, India
<http://www.defexpoindia.in>

19 February – 20 February
GREAT LAKES AVIATION CONFERENCE
 Rock Financial Showplace, Novi, Michigan
www.greatlakesaviationconference.com

20 February – 23 February
HELI-EXPO 2010
 George R. Brown Convention Center, Houston, Texas.
www.heliexpo.com

24 February – 26 February
INDIAN BUSINESS AVIATION EXPO
 Lalit Hotel, Delhi, India.
www.miuevents.com

25 February – 27 February
WOMEN IN AVIATION INTERNATIONAL CONFERENCE
 Orlando, Florida
www.wai.org

28 February – March 1
AIRCRAFT INTERIORS MIDDLE EAST
 Airport Expo Centre, Dubai, UAE
www.aime.aero

2 March – 3 March
UNMANNED AIRCRAFT SYSTEMS CONFERENCE
 Sheraton San Diego Hotel & Marina, San Diego, CA, USA
 URL: www.ttcus.com

2 March – 3 March
AIR CHARTER SAFETY SYMPOSIUM
 Marriott Westfields Chantilly, Virginia
www.acsf.aero

3 March – 7 March
INDIA AVIATION 2010
 Hyderabad, India
www.india-aviation.in

10 March – 12 March
MEXICAN BUSINESS AVIATION EXPO/HELMEX
 Toluca, Mexico
www.mbaexpo.com

11 March
NBAA REGIONAL FORUM
 TWC Aviation, Van Nuys Airport, Van Nuys, California
www.nbaa.org

the 747 programme. Revenue for the full year reached a record \$68.3 billion on higher commercial deliveries and growth in Defence, Space & Security.

The company's 2010 financial guidance reflects solid operating performance amid lower volumes, higher pension expense and continued investment in development programmes. Boeing's 2010 revenue guidance is \$64 billion (Rs 2,96,387 crore) to \$66 billion (Rs 3,05,650 crore) and reflects previously announced production rate reductions on 777 and reduced scope on army modernisation and missile defence. The company expects that 2011 revenue will be higher than 2010, primarily driven by higher estimates of 787 and 747-8 deliveries. Combining higher estimated deliveries with plans for R&D and other factors, operating cash flow in 2011 is expected to be greater than \$5 billion (Rs 23,155 crore).

Europe

A400M's success ushers in a new era for tactical airlift



Officials at Airbus Military have described the first flights of the A400M transport aircraft as heralding a new era in tactical and strategic airlift capability. The first flight lasted for three and a half hours. Further flights have taken place in December 2009 and January 2010. In capacity terms, A400M will carry roughly twice the load of a C-130 Hercules, and will be able to lift new armoured vehicles in the 30-tonne class. A400M is being procured on behalf of seven European nations, including the UK, by the OCCAR management agency, working in partnership with the national project teams. The other nations are

Belgium, Germany, Turkey, Spain, France and Luxembourg.

Eurocopter meets 2009 turnover and delivery objectives

Eurocopter, the world's leading helicopter manufacturer, met its business and delivery objectives for 2009 and stabilised its turnover at the level of its record year, 2008. The world economic crisis caused a sharp order decline in the civil market for light helicopters. However, governmental orders have over-compensated in value the drop in commercial unit sales, leading to the second-best result of order intakes in Eurocopter's history. In line with Eurocopter's roadmap, the Support and Services business was also strengthened with the signature of a number of significant contracts.

Deliveries remained stable with 558 new civil and military helicopters delivered in 2009 and almost matching the peak level of 2008. This figure reinforces Eurocopter's position as a major branded business division within EADS, accounting for a consolidated turnover of €4.6 billion (Rs 29,640 crore).

SPACE

Europe

Contract inked for Galileo System Support Service

Thales Alenia Space has announced the signing of the contract to provide ESA Galileo system Support Services, from 2010 till 2016. The contract was signed at the ESTEC headquarters of the European Space Agency. Contract value is about €85 million (about \$118.6 million; Rs 550 crore) which will cover the period 2010 to 2014, through which Galileo will be developed to become operational in early 2014. Thales Alenia Space is a joint venture between Thales (67 per cent) and Finmeccanica (33 per cent), and a European leader in satellite systems and a major player in orbital infrastructures. •

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training staff, did a training flight with the "Eurofighter Typhoon F-2000B" at an Italian air base in Grosseto recently. During Major General Popov's flight with the Eurofighter Typhoon, the aircraft was used to its full capacity. Manoeuvres such as 'one on one' and 'two against two' as well as circle flights of 75-minute duration were accomplished successfully.

EUROPEAN SPACE AGENCY

- Jean-Yves Le Gall, Chairman and CEO of Arianespace, and René Oosterlinck, Director of the Galileo Program and Navigation-related Activities at the European Space Agency (ESA), have signed the launch contract for the first ten 'Full Operational Capability' satellites in Europe's planned Galileo satellite positioning system at European Space Research & Technology Center in Noordwijk, the Netherlands. The contract is managed by ESA on behalf of the European Union. These 10 satellites will be placed in a circular orbit at an altitude of 23,000 km. They will be launched in pairs starting in December 2012, using five Soyuz launchers operated from the Guiana Space Center.

GRIPEN

- The first group of Thai Air Force technicians has arrived in Sweden for their initial maintenance type conversion course on the Gripen fighter. Training is underway at the Swedish Armed Forces Technical School in Halmstad and will continue until the end of the year. As part of their training, technicians spent time at Saab's Gripen manufacturing hub in Linköping. The technicians' training programme forms part of Thailand's 2008 procurement contract for six Gripen fighter jets.

LOCKHEED MARTIN

- Lockheed Martin completed only about 10 per cent of its planned test flights of the F-35 joint strike fighter last year because of delays in production of the test aircraft, according to a Pentagon report. Only 16 of 168 planned flights were completed in fiscal 2009, the second year of flight testing, according to Michael Gilmore, the Pentagon's Director of Weapons Testing. The programme called for 5,000 sorties to prove the aircraft's flying capabilities, electronics and software.

Divided they STAND



A Standing Parliamentary Committee has recommended that NACIL be converted into a holding company and the two airlines, Air India and Indian, be re-designated as NACIL-A and NACIL-I to function as independent entities

LAATEST REPORTS SUGGEST AIR INDIA and Indian (erstwhile Indian Airlines) may well be heading for splitsville. Operating as separate entities since their inception, the two national carriers, under orders of the central government, merged in February 2007 to form a single mammoth entity under the banner of National Aviation Company of India Limited (NACIL). Since the merger, the new company has been operating under the brand name "Air India". Nearly three years later, the Standing Parliamentary Committee on Transport, Tourism and Culture headed by Sitaram Yechury in its report has concluded that "the decision in this regard was taken in haste and that the merger of the two carriers was ordered without adequate homework and consultations". The committee has recommended that NACIL be converted into a holding company and the two airlines be re-designated as NACIL-A and NACIL-I to function as independent entities.

The decision to merge the two airlines was taken with ostensibly noble intentions. Faced with stiff competition from airlines in the private sector and mounting losses, especially in Air India, it was evident that the government-owned airlines would have to either perform or perish. Merger of the two public sector airlines presented lucrative opportunities to turn the loss making establishments around by trimming costs through optimisation of manpower/infrastructural resources, leveraging individual strengths, route rationalisation and economy of scale. But the plans seem to have gone awry.

Prior to the merger, in the financial year 2006-07, Air India and Indian had recorded losses of Rs 447.93 crore and Rs

240.29 crore, respectively. Post merger, loss reported by the combined entity rose from Rs 688.22 crore to around Rs 2,500 crore in 2007-08 and Rs 5,400 crore in 2008-09. Although the global economic meltdown contributed to aggravating the financial crisis, it was abundantly clear that the objectives of the merger had not been realised and the financial state of the airline had in fact worsened. Despite the proclaimed merger, both the airlines continued to operate as individual entities

as before with considerable duplication in infrastructure and manpower. There were no tangible steps taken to resolve issues related to financial, administrative and operational aspects arising out of the merger. Equipped with different types of aircraft, the two airlines had widely differing salary structures, perks, promotional avenues, work ethos and operational paradigms. The process of merger actually never got off the ground or beyond mere cosmetic levels and in retrospect, it is being seen as "a thoughtless exercise undertaken without considering all aspects and a whimsical decision meant only to serve vested interests".

Although there was awareness all along even at the highest levels of the government that the merger had actually been a paper exercise, it was only when Air India approached the government for a Rs 20,000-crore bailout package that the finance ministry was galvanised into action and decided to restrain the endless and ruinous financial drain. The expenditure secretary in the Finance Ministry has mooted a proposal to re-

verse the process of amalgamation. There has been a similar demand from some of the trade unions as well who have always held that it would be easier to manage two smaller companies than one huge monolith.

Reports of the government's decision to reverse the process of merger has been formally denied by the Ministry of Civil Aviation (MOCA) stating that "it (the merger) was a carefully thought out process and a collective decision of all agencies of the government of India", which obviously included the Ministry of Finance. Reaction by the MOCA is not unexpected as acceptance of the proposal of de-merger would tantamount to admission of lack of foresight, utter failure on its part to handle the process of merger and the obligation to explain why the expensive venture financed by the exchequer has floundered. After all, the MOCA is in direct charge of the airline, the appointment of the Chairman Air India being transitory in nature and devoid of real authority.

Evidently, for the public sector airline a prosperous future cannot be assured unless the key issues of efficiency, cost, service quality, route selection and productivity are addressed by those who claim ownership and are responsible for the management of the airline. The smoke screen of rhetoric can no longer conceal the rot that has pervaded the system. In the future, the government should wisely desist from costly experiments and take positive steps to shift ownership and management from the political and bureaucratic regime to the professional domain. In brief, the compulsion now is either to privatise or perish. SP

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