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[ snapshots ]



## NEED TO DO MORE: PRIME MINISTER MODI



PRIME MINISTER NARENDRA MODI ADDRESSING DELEGATES, EXHIBITORS AND DIGNITARIES AT THE AERO INDIA-2015 AIR SHOW IN BENGALURU

BY R. CHANDRAKANTH

The 10th edition of Aero India International Air Show kicked off at Bengaluru with the Prime Minister Narendra Modi making a clarion call to the defence public sector, private sector and foreign original equipment manufacturers (OEMs) to build a strong defence industry. Inaugurating Aero India, Modi said foreign firms must turn into strategic partners from a position of sellers. "We need their technology, skills, systems integration and manufacturing strength."

We are reforming our defence procurement policies and procedures. There would be a clear preference for equipment manufactured in India."

### TECHNOLOGY DEVELOPMENT FUND

The government, he said, is introducing a scheme to provide up to 80 per cent of funding for development of

a prototype in India. "We are also launching a Technology Development Fund." For too long, our research and development has been confined to government laboratories. We must involve our scientists, soldiers, academia, industry and independent experts more closely in research and development.

We have made our export policies clearer, simpler and predictable. But, we will also abide by the highest standards of export controls and international responsibility. We will expand our exports, but we will ensure that our equipment and technology do not fall into the wrong hands. India's record in this area has been impeccable and it will remain so."

### NEW EXCITEMENT IN SME SECTOR

Stating that he was pleased with the positive impact of 'our policies', he said "Indian private corporations have responded with enthusiasm. There is new excitement in our

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Narendra Modi, Hon'ble Prime Minister of India



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THE CMD AND EDITOR-IN-CHIEF OF SP GUIDE PUBLICATIONS JAYANT BARANWAL BRIEFING P ASHOK GAJAPATHI RAJU, UNION MINISTER OF CIVIL AVIATION ABOUT *BIZAVINDIA*, THE NEWLY RELEASED MAGAZINE.

small and medium scale sector. Many of the biggest global firms are forming strategic partnerships in India. Some of them have already begun using India as part of their global supply chains or engineering services."

"In September 2014 Dynamatic Technologies and its collaborator Boeing inaugurated a plant in India to manufacture critical parts for a Boeing helicopter that is sold globally. I understand that it was a day after 'Make in India' was launched. I am pleased to learn that the first set of parts is ready for shipment today. But, we still need to do more."

#### ACQUISITION AND APPROVAL PROCESS REFORMS REQUIRED

We have to further reform our acquisition and approval processes. We must indicate a clear roadmap of our future needs. This must take into account not only new technology trends, but also the nature of future challenges. We must pay attention to developing supply chains, with emphasis on innovation. We must bridge the gap between prototype development and quality of production. We must develop a financing system suited to the special needs of this industry. It is a market where buyers are mainly governments, the capital investments are large and the risks are high. We must ensure that our tax system does not discriminate against domestic manufacture in comparison to imports. More broadly, our defence industry will succeed more if we can transform the manufacturing sector in India."

In India, the defence industry in the government sector alone employs nearly 2,00,000 workers and thousands of engineers and scientists. They produce an output of nearly 7 billion dollars annually. It also supports a very large pool of small and medium enterprises. Our defence industry in private sector is still small. But, it already employs thousands of people. This is despite the fact that nearly 60 per cent of our defence equipment continues to be imported. And, we are spending tens of billions of dollars on acquisitions from abroad."

#### INCREASE DOMESTIC PROCUREMENT FROM 40 TO 70 PER CENT

There are studies that show that even a 20 to 25 per cent reduction in imports could directly create an additional 1,00,000 to 1,20,000 highly skilled jobs in India. If we could raise the percentage of domestic procurement from 40 per cent to 70 per cent in the next five years, we would double the output in our defence industry. Imagine the impact in terms of jobs created directly and in the related manufacturing and services sector! Think of the spin off benefits on other sectors in terms of advanced materials and technologies! That is why we are focusing on developing India's defence industry with a sense of mission."

This is why it is at the heart of our Make in India programme."

#### DEFENCE PROCUREMENT REFORMS

A nation with a strong defence industry will not only be more secure. It will also reap rich economic benefits. It can boost investment, expand manufacturing, support enterprise, raise the technology level and increase economic growth in the country. We are reforming our defence procurement policies and procedures. There would be a clear preference for equipment manufactured in India. Our procurement procedures will ensure simplicity, accountability and speedy decision making.

We have raised the permitted level of Foreign Direct Investment to 49 per cent. This can go higher, if the project brings state-of-the art technology. We have permitted investments up to 24 per cent by Foreign Institutional Investments. And, there is no longer a need to have a single Indian investor with at least a 51 per cent stake. Industrial licensing requirements have been eliminated for a number of items. Where it is needed, the process has been simplified. We are expanding the role of private sector, even for major platforms. Our goal is to provide a level playing field for all."

This is the largest ever Aero India. This reflects a new level of confidence within our country and global interest in India. To many of you, India is a major business opportunity. We have the reputation as the largest importer of defence equipment in the world.

#### PLATFORM TO LAUNCH DEFENCE MANUFACTURING

That may be music to the ears of some of you here. But, this is one area where we would not like to be Number One! Our security challenges are well known. Our international responsibilities are evident. We do need to increase our defence preparedness. We do have to modernize our defence forces.

We have to equip ourselves for the needs of the future, where technology will play a major role. As

*Continued on page 6...*

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...Continued from page 4

a nation of one billion people, we also have huge requirements for managing internal security. We are increasingly integrating technology and systems into it. These opportunities make Aero India an important international event. For me, this is not just a trade fair for defence equipment. This is a mega meeting of one of the largest global supply chains, with the most advanced technology and complex equipment. And, a platform to launch India's defence manufacturing sector. We speak in terms of national capacity, not public sector or private sector.

**OFFSETS IMPROVEMENTS NEEDED**

Offsets system is a crucial instrument to develop and upgrade our defence industry. We have introduced significant reforms in our offsets policy. I am acutely aware that it still needs a lot of improvements. We will pursue them in consultation with domestic industry and our foreign partners. I want our offsets policy not as a means to export low-end products, but to acquire state-of-the-art technology and skills in core areas of priority.

Government's support for research and development is essential for defence sector. And, it should also be accompanied by a degree of assurance on purchase. We need great infrastructure, sound business climate, clear investment policies, ease of doing business, stable and predictable tax regime, and easy access to inputs. We need a national industry that produces advanced materials, the most sophisticated electronics and the best engineering products.

**UNIVERSITIES AND SKILL DEVELOPMENT CENTRES**

Over the last eight months, we have worked hard to create that environment for you. Above all, we need a vast pool of highly skilled and qualified human resources for the defence industry. Our aerospace industry alone would need about 2,00,000 people in another ten years. We will set up special universities and skill development centres to cater to our defence industry, just as we have done in atomic energy and space.

I have especially invited the state governments to come here with package of facilities to attract investments in defence manufacturing. This is a new era for the

defence industry in India. It will be no longer enough to buy equipment and simply assemble them here. We have been doing this in the past, without absorbing any technology or developing our own capabilities. In some areas, we are where we were three decades ago. Frankly, our public sector needs to do much better than they are doing now. We have to exploit their huge assets and a vast potential. At the same time, we have to make them accountable. We want to develop an industry is dynamic. It should constantly stay at the cutting edge of the global industry. I am confident that India will emerge as a major global centre for defence industry. We have the basic building blocks for it in India; and, a large nation requirement.

The nature of industry is such that imports will always be there. In turn, they can use India as part of their global supply chain. Defence budgets around the world are becoming tighter. India's frugal but sophisticated manufacturing and engineering services sectors can help reduce costs. India can also be a base for export to third countries, especially because of India's growing defence partnerships in Asia and beyond.

A strong Indian defence industry will not only make India more secure. It will also make India more prosperous. Aero India can be a catalyst in realizing our goals. That is why I am here today. So, as we look at these wonderful aircraft and enjoy the amazing fly pasts, I also hope we can get some business done.

And, sow the seeds of successful new ventures and partnerships – to give our people new opportunities, to make our nations safer, and the world more stable and peaceful.

The Karnataka Chief Minister, Siddaramaiah said Karnataka, especially Bengaluru was positioned well to become the aerospace hub. Karnataka government had an aerospace 2013-23 policy. Inviting investments into the state, he said the United Nations had ranked Karnataka as the fourth global technology hub.

The Minister for Defence Manohar Parikkar, in his welcome address said the department of defence would work hard to make a success of the Prime Minister's 'Make in India' campaign. The Minister of State for Defence, Rao Inderjit Singh proposed a vote of thanks. •

# Separate 'Make in India' Policy for Defence?

BY R.CHANDRAKANTH

The Union Minister of Defence, Manohar Parrikar today categorically stated that the government 'has not finalised positively or negatively' the French multi medium role combat aircraft (MMRCA) – Rafale. The deal, he said, presently is with the commercial negotiation committee (CNC) and that he has asked for a final report which is likely to be submitted next month.

Addressing a press conference after the inauguration of the 10th edition of Aero India International Airshow, Parrikar said 'let the CNC complete the process'. The MMRCA project is to acquire 126 French Rafale aircraft. According to media reports there are issues between Dassault and Hindustan Aeronautics Limited on the issue of 'ownership' of 108 Rafale aircraft which the latter should manufacture if the deal comes through. There are also issues of price.

Parrikar clarified that the delay in the decision-making process on the MMRCA had not affected the operational capability of the Indian Air Force. "We have improved availability of the existing fleet." The downtime of an aircraft going for repairs and maintenance has been brought down. Asked whether the MoD would go for any other aircraft in the interim, he said "I will not be discussing my strategy with the media".

**HAL ASKED TO ACCELERATE PRODUCTION**

Appreciating Hindustan Aeronautics Limited on the helicopters it had produced (Dhruv, Rudra etc), he said HAL however had to accelerate its production from the current 20/30 units to more. "I am impressing upon HAL to improve their production rate. The helicopter industry is growing fast. We have a combined requirement of 388 and we have opened it up for 'Make in India'." Besides, there was growing demand from the civilian market.

There were two routes to meet the market requirement, HAL locating a manufacturing line in one of its many locations and the other opening it up to the private sector.

**MAKE IN INDIA – SEPARATE POLICY**

Mr. Parikkar said the government has been thinking of coming out with a separate policy for defence sector on 'Make in India'. "We have been in discussions on whether Make in India should be outside the defence production procedure (DPP) and we will take a call soon on that." The policy changes would be notified in April/May this year. In the next five years, we would like to have nearly 75 per cent of defence production under 'Make in India'.

The DPP itself needed clarity, he said and mentioned how there was con-



RAFALE

fusion with regard to 'Buy in India' (which needed 30 per cent Indian composition); 'Buy and Make in India' (50 per cent). "The 50 per cent is not well defined." Even Offsets the government was going through the document and major changes are expected soon. The policy will include small and medium enterprises in a substantial way.

**AERO INDIA STAYS IN BENGALURU**

Scotching rumours that the next edition of Aero India would be either held in Goa (his home state) or in Surat (home state of the Prime Minister), Mr. Parikkar said it would be held in Bengaluru as 'it is the apt place for the job'. However, there was need to expand the area and make it more convenient.

Stating that this edition had attracted considerable interest, he said the exhibition area had gone up from 1.25 lakh sq. m to 2.50 lakh sq.m; the number of Indian companies had shot up from 156 to 295 and foreign from 212 to 328; foreign delegations from 78 to 109; number of countries from 31 to 49; and number of aircraft from 63 to 72. "Interest in the defence sector has gone up tremendously and we expect the results of the business deals in the near future." •

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WHEN RESULTS MATTER

# India's Tejas Era Begins

BY SP'S SPECIAL CORRESPONDENT

**O**n display here at Aero India 2015, you couldn't have missed the static display of the LCA Tejas, India's light fighter. Unlike the LCA that enthralled Prime Minister Narendra Modi at the inaugural flying display yesterday, the Tejas on ground is the first production series fighter in a project that has spanned three decades, crossed thousands of hurdles, and finally produced a sturdy light-weight fighter plane. The specimen you see on the ground was recently handed over to the Indian Air Force, formally beginning the type's life with its primary customer. But work is far from over. Indeed, in many ways, the real work starts now.

Over the next nine-ten months, the baseline version of the Tejas will gallop through a substantial list of pending test points it is mandatorily required to cross before it obtains final operational clearance, a milestone that declares it officially available for real operations. While there have been whispers that slow progress could push the final date for clearance to mid-2016, the Aeronautical Development Agency (ADA) is firm in its view that they want to wrap things up by 2015, so series production at HAL can kick off in earnest and energies can be rightly focused on the Tejas Mk.2, a modified variant that will fly on the powerful F414-GE-INS6 engine as opposed to the F404 that the Mk.1 flies on.

The dash to the FOC deadline began in December 2013, and it's been a tough journey. During the next few critical months, the Tejas will be made to demonstrate aerial refuelling from an IAF Il-78M tanker, demonstrate the use of the Gryazev-Shipunov GSh-23 gun in flight, demonstrate a high-speed low drag bomb fitted with a retarding tail assembly, demonstrate drop tanks for the supersonic regime, integrate and fire Israeli Derby and Python beyond visual range missiles. The FOC tests also include enhancing angle of attack and overall flight envelope.

In 2013, ahead of the final test campaign, the LCA Tejas had demonstrated its operational prowess at the Iron Fist fire power demonstration over the Thar Desert, in an effort to see the platform perform alongside other aircraft in IAF inventory. The LCA Tejas fired an R-73 missile and dropped precision guided bombs during the demonstration. Said Air Commodore K.A. Muthana of the National Flight Test Centre (NFTC) on its performance, "The Indian Light Combat aircraft (LCA) was conceived in the early eighties and is now on the threshold of entering squadron service. The legacy of this aircrafts' development has resulted in true challenges to deployment being faced at a very late stage. There are even insinuations that this aircraft has been more of a success to the scientists in lab coats than to the war fighter in flight suits. True; this fine aircraft has



been hostage to a series of systemic shortcomings. There are significant lessons here for the Indian aviation industry. It is vitally important that these lessons are imbibed in order to move forward coherently in building a strong aeronautics industry in this country. Tejas is a wonderful flying machine. It deserved to be in squadron service years ago. Remedial action on many of the shortcomings commented upon, if implemented even now, will favorably impact timelines for IOC and FOC of the Tejas Mk 1 aircraft. Favorable impact on Tejas Mk 2 and other future programs will be enormous."

And that's where Aero India 2015 comes in. At the show this year, two things happen for the Tejas that should be of interest to the world. One, it has finally been unveiled as a ready, production series airplane. Customers looking at the Tejas as a light frontline air defence platform or a high-performance lead in jet trainer will now be able to strike up real conversations on possible export deals. With the IAF ordering only 40 odd jets of the Mk.1 baseline version, the field is open for foreign customers to make use HAL's production line and strength. Second, with work on the Mk.1 largely done, the opportunities for co-operation on the Mk.2 with global firms is now an open field. The Aeronautical Development Agency (ADA) has had a busy year, with marked progress on the LCA Navy too. But, as Air Commodore Muthana notes, the lessons of the Mk.1 are critical to the success of the more important Mk.2, of which the IAF wants 80 odd units. It is the Mk.2 that will be the true Tejas. •

# Indo-Brazilian AEW&C to Enter IAF Service

BY SP'S SPECIAL CORRESPONDENT

**T**he quietness of this aircraft belies the enormous interest it has evoked in the regional market already. Its return to Aero India this year is, therefore, no big surprise. The Indo-Brazilian EMB-145I airborne early warning & control (AEW&C) aircraft is the near the end of development and systems flight trials. The Defence Research & Development Organisation (DRDO), which has developed the heart and brains of the platform, is looking to begin user flight trials any time after April, with an induction window of before Christmas. Given how smooth things have been on the programme so far, it looks good.

Inquiries began pouring in six months ago on the platform, and possible demonstrations of its capabilities. While the EMB-145I is obviously a sensitive project involving advanced sensors and proprietary electronics developed in-house by Indian laboratories, you will see foreign interest in the aircraft at this year's show. Delegations, military teams and others from the region will be given tours of the aircraft and briefed on its capabilities. Memoranda of understanding on further information exchange on the programme could be signed with certain countries. A significant level of interest has been shown from West Asia, South East Asia and Latin America, traditional markets for Indian defence exports, with vast potential for more.

Dr Sargunraj Christopher, Director of Centre for Airborne Systems (CABS) said, "The lightweight jet is capable of operation from almost any air airfield. More importantly, the network centric sensor

system enables joint battle management from air, land and sea. Towards this ground systems are available to enable the operators to plan the mission, communicate the complete information from the aircraft to the command and control centres via multiple data links. A comprehensive training station is available to train the operators on all the aspects of the mission on the ground. A automated test equipment system also is available which enables trouble shooting at LRU level. Currently though the system is customised for the Indian Air force, the AEW&C India can fine tuned to any specific user oriented early warning product through appropriate programming/software which can be defined by the user."

Developing the active array antenna unit and other electronics and sensor packages on the programme hasn't been easy, though the IAF and DRDO were clear that this had to be entirely an in-house effort. Said Dr Christopher, "While India has caught up with the rest of the world in adopting the Active Electronically Steering Array (AESA) Antenna for its radar; the two building-block

components of the radar, the Transmit-Receive Multi-Module (TRMM) and the teflon-clad ultra light Antenna Panel are notable Indian innovations in the radar sub-system. These are developed by CABS and with a joint patent along with M/s Astra Microwave, Hyderabad for TRMM. The most important outcome of the efforts is the realisation of a system that is both operation-efficient and cost-effective."

An already satisfied primary customer has given the thumbs up. It remains to be seen who else will. •



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# Future Aircraft: Low Observable Progress?



PAK FA



AMCA

BY SP'S SPECIAL CORRESPONDENT

Plenty about the Indian aerospace scene perplexes analysts and observers. Examples are plentiful. One of them is activity in the stealth aircraft area, where India has the distinction -- it's arguable what sort of distinction -- of working on two separate and comparable stealth combat aircraft. The first, the Prospective Multirole Fighter (PMF), an 'Indianized' version of the Russian Sukhoi T-50 PAK FA, isn't off the drawing board yet. Russia and India, in fact have been working to clear hurdles that will lead to an R&D phase that takes the project forward and provides crucial definition to the fifth generation platform that will finally enter service with the Indian Air Force starting around 2023. The second project, reportedly poised to acquire formal project status this year, is the lesser known Advanced Medium Combat Aircraft (AMCA), intended to be a fully (or largely) Indian effort to build a twin-engine multirole stealth fighter jet. The status of both projects indicates they're both 'ON'.

Consider the similarities of the proposed platforms: both the PMF and AMCA will be twin-engine fighters with low-observable features all round, be capable of supercruise, sport internal weapons bays, deploy AESA radar and smart weapons and boast of data fusion. Both fighters are intended to be multi-mission, multirole jets with an equal emphasis on strike and air engagements.

For all the speculation and analysis that swirls around the two projects, it is necessary to accept one truth: both will be enormously expensive, and the commonalities of both projects leave a plethora of questions unanswered, not all of them comfortable. For instance, if the PMF is truly a joint project that will involve substantive sharing of technology, why does India feel the need to reinvent the wheel (on the AMCA) on critical technologies it should expect to get from Russia as part of the PMF programme anyway? Second, what is the level of potential technological between both concepts, given that they have much in common even at the concept stage? Do the ab-initio technologies India is developing as part of the AMCA justify a separate project? Finally, what about inventory concerns? Can the Indian Air Force, even with the prospective lead time that timelines on the AMCA and PMF would provide, be in a position to manage two separate stealth aircraft types, neither of which it currently plans to operate in numbers higher than 150 aircraft each? With budget cuts and austerity measures, can India afford to fund two expensive fifth generation fighter programmes? Are India's next generation requirements clearly defined? Will the PMF/FGFA and AMCA occupy similar spaces? How will their roles be separately defined? Is the FGFA truly a "joint" effort, or is it more on the lines of the Su-30MKI programme? But these are questions India's planners have hopefully considered. The fruits of two parallel stealth aircraft programmes, one a joint effort with Russia, the other a singularly Indian effort, will be judged on visible results over the next three-four years.

The opportunities for partnerships at the basic and advanced level on the AMCA, which has finally taken on a 'frozen configuration', remain plentiful.

Developed from the ground up by Indian scientists in Indian laboratories, the AMCA hopes to be a truly Indian effort. One crucial aspect has changed, though. Planned as a platform powered by twin GTRE Kaveri turbofan engines, it is now certain that the AMCA, at least in its prototype stage, will be powered by foreign engines. An evaluation is currently under way on which engines could potentially power the AMCA in its prototype phase.

According to the latest official definition, "The AMCA is being designed as a stealth, medium weight, twin engine, multimission aircraft with a swing-role capability. The aircraft has trapezoidal wings, all moving horizontal tails and twin canted vertical tails. Aiding the beyond visual range (BVR) combat capabilities of the aircraft are low radar signature, extended detection range and targeting, supersonic persistence and high speed weapons release. Close-combat operations are facilitated by high angle-of-attack capabilities, low infrared signature and all-round missile warning system. The stealth mission features SEAD, precision strike and maritime operations. Among the advanced technologies that confer stealth capabilities are serpentine air intakes, internal weapons bays, radar absorbing structure (RAS), radar absorbing materials (RAM), frequency selective surface radome and conformal air data probes. The avionics system features integrated modular architecture supporting NCW capabilities, advanced pilot-vehicle interface, pilot associate and integrated vehicle health management. The integrated flight and propulsion control system will combine the traditional flight control functions with thrust vectoring and engine control functions."

In every sense, these are advanced technologies no country would be willing to share -- and there lies the central justification of the AMCA project. A joint programme like the PMF is crucial to shoring up capabilities, building manufacturing partnerships and leveraging the bilateral relationship with Russia. But true development of technologies like low-observable technologies will be required to be produced in-house. If AMCA project director Dr A.K. Ghosh meets his objectives, then one of the most compelling aspects of the AMCA will be its cockpit and man-machine interface. In the last two years, several private companies big and small have stepped forward with technological inputs and proposals for partnerships to give the AMCA a chance at being as 'Indian' as possible. Several of these proposals are currently under consideration by the programme team. The result: a supply chain and network of agencies, entities and laboratories has quickly taken shape and will be crucial to the next long phase of the AMCA, which involves actually building a technology demonstrator.

The Indo-Russian PMF and the Indian AMCA put India in a highly unusual situation as far as future aircraft are concerned, perhaps more unique than any other country at any other time. The hope is that what's never been done before will yield more opportunities than expected, and that a mature Indian private sector will be in a position to step up and claim part of a national effort. For foreign partners, the field remains open as always for consultancies, technological tie-ups on crucial systems and the actual business of testing such platforms. •

# Flying Display



(CLOCKWISE FROM TOP LEFT) LCA TEJAS, LIGHT COMBAT HELICOPTER, SU-30 MKI AND BREITLING WINGWALKERS

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Announcing this the Joint Secretary of Civil Aviation, G.Asok Kumar said that this is being worked out at the Bengaluru airport and should be deployed soon. Passengers can use their mobiles for check-in, baggage handling etc. Airlines around the world have started using electronic systems for check-in. Instead of using traditional paper tickets (Electronic boarding passes are also called paperless, mobile or eboarding passes), a passenger can download an electronic boarding pass to his or her web-enabled device (cell phone, Blackberry or iPhone, for instance). The boarding pass looks like a square bar code, which stores passenger name and flight information. When he or she gets to the security checkpoint, all that one has to do is show the bar code on the mobile screen and security staff will scan it. (You will also need to show personal ID.) The electronic boarding pass also works at the airline gates. •

## Airbus A400M Refuels Two F-18 Fighters Simultaneously



The Airbus A400M new generation airlifter has further proved its credentials as a tanker by successfully demonstrating simultaneous air-to-air refuelling of two F/A-18 fighters. In the course of four flights, the A400M performed 74 contacts and dispensed 27.2 tonnes of fuel to the Spanish Air Force aircraft. Refuelling was conducted at altitudes of 20,000ft - 33,000ft, and airspeeds of 180kt - 300kt - the preferred refuelling envelope for fighters.

With a basic fuel capacity of 50.8 tonnes which can be increased by the use of extra cargo hold tanks, the A400M is the most capable tactical tanker in the

market. The standard A400M aircraft has full provisions for air-to-air refuelling (AAR) operations already installed and only requires the rapid installation of the optional air-to-air refuelling kit to become a tanker. Designed from the outset to be a dual-role transport and tanker aircraft, the A400M provides air forces with a cost-effective way to acquire an air-to-air refuelling capability in addition to a versatile logistic and tactical airlifter. On a typical tanking mission where it would loiter for 2 hours at a range of 500 nm (930 km) from base, the A400M would have a potential "fuel give-away" of 34,000 kg (75,000 lb). •

## RUAG Aerostructures partnership with TAL

BY R. CHANDRAKANTH

RUAG Aerostructures, a global supplier and integrator of Aerostructure components and TAL Manufacturing Solutions Ltd., a Tata Enterprise and a leading company in Commercial & Defence Aerospace manufacturing in India, entered into partnership for manufacturing and supply of aero structural components and sub-assemblies. The two companies signed a multi-year contract with a potential value of over US\$ 150 million. The new work scope allows RUAG to strengthen and optimize the global supply chain to the advantage of Airbus.

As part of the contract, TAL will manufacture and supply over 550 sheet metal components, machined parts and sub-assemblies to RUAG, for Airbus'

fast moving, successful A320 programme. Going into two fuselage sections of the Airbus A320, these parts are processed from steel, aluminium and titanium and involve use of some of the most sophisticated and futuristic equipment in aerospace manufacturing.

Urs Breitmeier, CEO of RUAG Group points out: "I am pleased about the established partnership with TAL Manufacturing Solutions Ltd. It reflects our strategy to go global in the supply chain and enables RUAG to strengthen its position as a leading first-tier supplier in Aerostructures."

Adds Rajesh Khatri, Executive Director & CEO of TAL said "the partnership with RUAG further exemplifies our commitment to global benchmarks. We underwent a most stringent qualification process and have brought our experience and learnings from our other premier programmes to bear on this. This contract will see us investing further in our state-of-art aerospace infrastructure at Nagpur and will uniquely position us as a supplier to two of the world's most advanced and successful airplane programmes, the Boeing 787 Dreamliner & the Airbus A320." •



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**A Govt. of Gujarat Undertaking**  
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# Rockwell Collins Next-gen Avionics Solutions for India's Military Aviation

BY JIM WALKER, VICE PRESIDENT AND MANAGING DIRECTOR, ASIA PACIFIC REGION, ROCKWELL COLLINS

As a leader in avionics products and systems, Rockwell Collins is strongly positioned to provide India civil and military operators with a host of new and upgraded avionics for a wide assortment of fixed wing aircraft and helicopter applications, as well as the rapidly growing market for "smarter" unmanned aerial vehicles (UAVs).

The needs for enhanced situational awareness, interoperability, reduced crew workload and enhanced levels of flight safety for India's defence forces are constantly increasing.

Today, thousands of fixed- and rotary-wing aircraft around the world are flying with Rockwell Collins avionics products. Our components and systems are helping these crews fly better and safer missions. And, whether it's a new installation or a retrofit program, each of our products is backed by our unmatched global product support and training network.

Rockwell Collins' Athena integrated flight control and navigation systems for UAVs are miniaturized, lightweight and highly reliable. They provide control for INS, GPS and air data, attitude, heading and reference. Available in low-cost, redundant configurations, these systems enable autonomous operations



and are proven with more than 1 million flight hours in combat theaters. Used on both manned and unmanned aircraft, these systems are moving toward obtaining commercial certification.

## NEXT-GENERATION AVIONICS FOR NEW AND RETROFIT APPLICATIONS

While we are gaining a leadership role in UAV avionics and systems, our foundation is strongly set in our business, commercial and military avionics solutions. Our unique approach and open system architecture enable our avionics to be used across many platforms, providing commonality and cost savings to our customers.

For example, our new-generation Pro Line Fusion integrated avionics system offers customers the opportunity to leverage the best in commercial and business aviation technology for military aircraft applications. Pro Line Fusion is now being featured on multiple business aircraft as well as the Brazilian Air Force's KC-390 and the AW

609 tilt rotor.

Pro Line Fusion's architectural flexibility enables a versatile, role-adaptable aircraft to serve both military and commercial customers.

Rockwell Collins is in Aero India exhibit in Hall E, booth E3.16. •

# Embraer Executive Jets Positive About India



PHENOM 100E

BY R. CHANDRAKANTH

With the Narendra Modi government at the Centre, Embraer Executive Jets is positive about prospects for the aviation industry. The market for business jets in India, as in the US, is likely to grow steadily, though not at high rates, but at healthy rates, according to Claudio Camelier, Vice President of Sales and Marketing, Asia Pacific and Middle East, Embraer Executive Jets.

On the eve of Aero India 2015, Camelier said "India is a country that has the widest portfolio of Embraer Executive Jets - from the Phenom 100E to the Lineage 1000 - with 20 jets in operation." The aircraft in India are: one Lineage 1000; four Legacy 650; six Legacy 600 (including five VIP transport); one Phenom 300; six Phenom 100/Phenom 100E; and two ERJ 135/shuttle.

The Phenom 300, he said, was the world's most delivered business jets in 2013 and 2014. In the market it has over 310 Phenom 100 and over 240 Phenom 300. At Aero India, Embraer will be showcasing Phenom 300, belonging to Joy Alukkas Group. In the past five years, Embraer has had a good run to take the number one slot in marketshare at 35 per cent, followed by Bombardier at 26 per cent; Hawker Beechcraft (no longer in operation) 16 per cent; Dassault nine per cent; Cessna seven per cent; Gulfstream three per cent and others four per cent.

In Asia-Pacific region, the main markets were India, Indonesia and Australia, while there was considerable slow-down in China. India has 20 Embraer

Executive Jets; Indonesia 28 (eight light and 20 large jets); China 21 (one light and 20 large jets) and Australia five (three light and two large jets). The point of concern for Embraer has been China where the company is assessing whether to hold on to its facility at Harbin (manufactures Legacy 650). "We have capacity in Brazil and we are still assessing the situation."

Giving global figures of EEJ fleet deliveries, Camelier said from 2010 when it peaked to 145, there has been a slump. The deliveries for 2011 and 2012 were 99 each; 2013 - 119 and 2014 - 116. Indicating that there was slow recovery, he attributed several reasons for the offtake, one of them being too many pre-owned aircraft up for sale. The estimate was about 2000 aircraft of which nearly 500 would be aircraft less than 10 years old. The counter-challenge for the pre-owned market could be positioning new aircraft for its low maintenance; state-of-the art avionics; operational efficiency and other features. In countries like India, there were issues of infrastructure - no fixed based operators (FBOs), taxation and regulatory which were hampering offtake.

However, he said the company was hopeful of better prospects considering that India with an anticipated GDP growth rate of 6.7 per cent and China with 6.5 per cent will have a positive impact. The 2015-2024 market forecast was 9,250 units worldwide of all business jet aircraft and Asia Pacific would account for 570 aircraft and China 835 aircraft (in the hope that the economy will bounce back). •

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# BEL Showcasing Wide-ranging Capabilities at Aero India 2015

BY SP'S CORRESPONDENT

The Bharat Electronics Ltd (BEL) is participating in Asia's premier airshow and exhibition, Aero India 2015 (February 18 to 22, 2015). BEL is showcasing its wide range of capabilities at Indoor Stall E.26 and outdoor display near Hall E.

The Navratna defence public sector undertaking Bharat Electronics Limited is showcasing its capabilities spanning every domain of its business – electronic warfare and avionics, C4I systems, radars, missile systems, communication systems, naval systems, electro-optics, fire control systems, technology modules, simulators and shelters. BEL is also displaying its research and development capabilities by demonstrating some of its new products/technologies.

C4I systems on display include F-INSAS/FCS (futuristic commando system), trusted computing platforms like tactical palm computer, wrist wearable computer, rugged tablet computer and rugged laptop; combat management system – live display of software on test bed; tablet PC and secure smart phone. Digital mobile radio relay (DMRR) is also being showcased.

Technology modules like Satcom Modem, EDU and receiver module for Konkurs-M missile is also on display. Communication systems display includes the software defined radio (SDR) manpack, advanced VLF receiver/modulator, combat net radio Mk II, CCS-IV (IP-based test bed), point to multi-point radio for surface-to-air-missile systems, advanced interoperability communication system, HF radios, radio relays and SDR test bed.

Electronic warfare and airborne products on display include avionics for light combat aircraft (LCA) – digital flight control computer (DFCC), air data computer (ADC), pylon interface box – inboard, outboard, laser (PIB-IB, OB, Laser), stores interface box (SIB), function sensor display unit (FSDU), multi-function rotary switch (MFR), multi-function keyboard (MFK), engine fuel indicator (EFI), get-home (GUH); multi-spectral warning system (MSWS), radar warning receiver (RWR), radar finger printing system (RFPS), combined interrogator & transponder (CIT), ESM system (Kite Mk II) and Rustom unmanned aerial vehicle (UAV) LRUs – airborne integrated payload processing unit (AIPPU), ground integrated payload processing unit (GIPPU), airborne spread spectrum modem (ASSM), ground spread spectrum modem (GSSM) and COMPASS (compact multi-purpose advanced stabilised surveillance system).

BEL is displaying a host of new radars – battlefield surveillance radar – extended range (BFSR-XR), ground penetrating radar, Ashlesha radar and secondary radar, identification of friend or foe interrogator (IFFI MK XII S). Naval



AKASH MISSILES ON DISPLAY

systems on display include short-range fire control system (stabilised target designator sight), stabilised optronic pedestal and sonar transducer dome.

Also on display are the complete range of electro-optics and fire control systems – medium-range fire control system (infrared search & track), long-range surveillance system, passive night sight for INSAS rifle / LMG and for rocket launcher, passive night vision binocular, goggle and monocular, thermal imager sight for assault rifle (uncooled), handheld thermal imager, laser dazzler, laser-range finder – air defence higher repetition, laser warning system, panoramic surveillance system, 3 types of indigenous display – rugged video display for T-90, map based display for advanced land navigation system (AERV-Mk II), rugged multi-function video display; electronic upgrade system for 155mm/52C artillery gun – gun control computer, gunner display, loader display, power distribution unit, emergency safety unit, feedback sensor, hydraulic block, joystick; and handheld digital compass.

Encryptors including IP encryptor & link encryptor for versatile environment (LIVE) encryptor are on display, besides various simulators.

The highlight of BEL's outdoor display is the army version of the Akash missile system, including the troop level radar, troop control centre and 3D central acquisition radar (3D CAR). The upgraded Schilka weapon system, an all-weather, self-propelled, tracked, low-level air defence weapon system, and intermediate level maintenance vehicle shelter (ILMV shelter) is also on show. •

# BizAvIndia Launched

BY R. CHANDRAKANTH

- To address challenges and opportunities of business aviation segment in India
- To further network the industry for cohesive action

On the eve of Aero India 2015, SP Guide Publications and Business Aviation Operators Association (BAOA) launched 'BizAvIndia', a quarterly magazine which will focus on the challenges and opportunities of business aviation, a segment which has tremendous potential to grow. 'BizAvIndia' is a supplement of SP's Aviation, the flagship aviation magazine from SP Guide Publications.

'BizAvIndia' was launched by the Joint Secretary of Civil Aviation, G. Asok Kumar at the BizAvIndia conference. The magazine was released in the presence of the Editor-in-Chief and Chairman and Managing Director of SP Guide Publications, Jayant Baranwal, Rohit Kapur, President, BAOA, Peter Bunce, President and CEO of General Aviation Manufacturers Association (GAMA) and Kurt Edwards, Director General of the International Business Aviation Council (IBAC).

## FIRST OF ITS KIND

In a first of its kind in the aviation sector, in India, an industry body and a publishing house have joined hands to further promote the interest of the industry which is in a fledgling state, so to say. The magazine will be for and by the business aviation industry in coordination with BAOA.

Speaking on the launch of 'BizAvIndia', Rohit Kapur appreciated the efforts of SP Guide Publications, particularly that of Mr. Jayant Baranwal who 'is passionate and supportive of business aviation'. BAOA, he added, is happy to



G. ASOK KUMAR JOINT SECRETARY, CIVIL AVIATION RELEASING 'BIZAVINDIA' IN THE PRESENCE OF ROHIT KAPUR, PRESIDENT, BAOA AND JAYANT BARANWAL CMD SP GUIDE PUBLICATIONS

be partnering with SP Guide Publications which has earned a name for itself in aerospace and defence publishing.

## INAUGURAL ISSUE

The inaugural issue is focussed on regional and remote connectivity in the light of the present government's push to expand pan-India air connectivity. The issue has several articles written by industry experts which are informative, analytical and forward-looking. There is a perspective from original equipment manufacturer (OEM) Embraer, thus reflecting how important OEMs are in the overall development of the aviation sector in India. •

# Time to Think Small



BY R. CHANDRAKANTH

Realising the neglect of the general and business aviation segment of the aviation sector, the Government of India is changing its focus and started thinking small (small aircraft), announced the Joint Secretary of Civil Aviation, G.Asok Kumar.

Inaugurating the 'BizAvIndia Conference', on the eve of Aero India 2015 in Bengaluru, Asok Kumar said the Government had formed a sub-committee in the Ministry of Civil Aviation to look into the concerns of the general aviation segment and the committee had put forth a number of points to the Union Finance Minister, Arun Jaitley on how aviation can be an engine of growth. A 'course correction' is taking place, he assured the industry.

## FAA DOWNGRADE TO BE REVOKED SOON

The Joint Secretary listed out the initiatives that the government was taking, starting with getting the US FAA (Federal Aviation Authority) downgrade revoked. The Ministry is working on enhancing safety measures, though India had one of the best safety standards, and the FAA downgrade should be revoked soon.

## SCHEDULE COMMUTER AIRLINES

In the next few months, the government will be introducing a unique concept of Schedule Commuter Airlines not only to enhance regional and remote area connectivity, but also to encourage the general aviation sector to grow. The Ministry is working on revising the route dispersal guidelines (RDG) and this should be finalised soon. Under the plan is to have code share between scheduled operators (airlines) with non-scheduled operators (general and business aviation operators).

## CLUSTER APPROACH

Asok Kumar said as ground handling charges at airports were high and the small operators were finding it difficult, there was a plan to have a group of non-scheduled operators (NSOPs) to have common maintenance facility. This would bring down costs.

## INTERNATIONAL PERSPECTIVE

The President and CEO of GAMA, Peter Bunce in his keynote address said the potential of the general and business aviation sector 'is truly phenomenal', but India need to set conditions right for its growth through proper policies, infrastructure creation etc.

The challenges were many including the perception that business aviation did not add value to the economy. This lack of understanding that it can add substantial value has to be driven home and it is happening. The impediments for the sector are: no coherent regulatory approach; punitive taxes and charg-

es; lack of general aviation infrastructure; economic disincentives; poor airport access etc.

As regards MRO (maintenance, repair and overhaul) facilities, he said, India's MRO market potential is \$700 million and that presently 90 to 95 per cent of MRO work goes outside India. With regard to taxation, the government he hoped would realise that the tax revenues from the sector were minimal and that it would be better to encourage the industry with better tax structure. The import tax and CVD on aircraft in India were among the highest in the world.

Looking ahead, Bunce mentioned that regulation should be proportionate and it should align with global practices; focus on aviation safety and also align with national economic and fiscal regimes.

## ISBAO BENEFITS

The Director General of IBAC, Kurt Edwards talked about the benefits of implementing ISBAO (International Standards for Business Aviation Operations). There are 750 operators around the world and India had only one operator who was audited under IS BAO – that is SRC Aviation. The certificate was presented to SRC Aviation at the conference. Edwards said safety management systems would prevail all over the world sooner than later.

## NEW GOVERNMENT, NEW PACE

In his welcome address, the President of Business Aviation Operators Association, Rohit Kapur said that the association has been growing steadily since it began in 2011. It now has 77 members and was filling a void in the industry.

Kapur said that with the new government coming in, there has been a new pace to development. "It is a positive change. We are confident soon enough, things will start changing."

## AIRCRAFT MANAGEMENT OPERATORS

In a session on opportunities, Jayant Nadkarni, co-founder of Invision Air, said the concept of aircraft management would be the next thing in India. Presently, of the 120 non-scheduled operators, 110 are owners and operators themselves and many of them were unaware of aircraft management nuances.

The benefits of aircraft management concept, he said, were many including – readymade industry connectivity, flight department, SMS running etc; better planning – faster off the block and more efficient operations; economies of scale (lower insurance, maintenance); access to additional aircraft and additional crew; and de-risking and protecting owners.

The Secretary of BAOA, Group Capt. R.K.Bali spoke about 'regional and remote air connectivity – the way forward'. There were sessions on MRO: unleashing the sector; environment and opportunities and helicopter operations. •

# Gujarat Beckons Investments in Aviation

The state of Gujarat has been a progressive one. It is taking active steps to develop all sectors, including aviation. The Director of Civil Aviation, Government of Gujarat, **Captain Ajay Chauhan** explains the steps the state is taking to network intra and inter-state.



under operational jurisdiction of the Airports Authority of India (AAI), three with the Indian Air Force of which two have civil terminal, two airports are private and two are in the Union Territory of Daman and Diu which do not form part of Gujarat but are used frequently by the people of Gujarat. There needs coordination to develop and sustain them.

**SP's: What are the challenges before you as the Director of Civil Aviation?**

**Chauhan:** For enabling us to achieve or comply with the requirement of civil aviation authorities, it is essential to set the guidelines clearly and specifically, especially when it comes to planning and implementation of the mandatory amendments which are always time bound.

**SP's: How much has the Gujarat State Aviation Infrastructure Company Ltd (GUJSAIL) achieved in its mission?**

**Chauhan:** GUJSAIL is governed by the Government of Gujarat with an aim to boost the aviation sector in the state. GUJSAIL has plan and systematic approach for diversifying the aviation sector to the next level by bringing in new investors to the state.

**SP's: How do you project the development of GUJSAIL in next 10 years?**

**Chauhan:** GUJSAIL has planned to implement aero sports, intra-state connectivity, MRO development, disaster and rescue operation and a training academy, etc. GUJSAIL is planning to develop, only one of its kind, an "Aviation Park".

**SP's ShowNews (SP's): How can the state civil aviation department help in the overall development of aviation in India?**

**Captain Ajay Chauhan (Chauhan):** The Civil Aviation Department of respective states can be a part of national development, if all work towards the objectives mentioned below:

- Develop world-class aviation infrastructure with passenger comfort, efficient cargo handling and facilities for maintenance, repair and overhaul (MRO).
- Operationalisation of Airports Economic Regulatory Authority.
- Establishing an adequately resourced and effective state safety oversight system operating above the international standards set by the International Civil Aviation Organisation (ICAO) for safe, orderly and sustainable air transport with acceptable level of safety (ALOS) for scheduled, non-scheduled, general aviation and helicopter operations.
- Protection of passenger rights in case of delays, cancellations and overbooking.
- Enforcement of security regulations in terms of internationally accepted standards.
- Better domestic and international connectivity.
- Rapid development of helicopter operations.
- Use of advanced information technologies for enhanced efficiency and transparency.

**SP's: What steps can be undertaken to develop coordination between state civil aviation departments and the Ministry of Civil Aviation?**

**Chauhan:** The civil aviation department has taken initiatives by creating special scheme called "single window clearance" for routing all the file/correspondence under one channel for taking all the necessary clearance from the respective authorities. In the Ministry of Civil Aviation, there should be representative of every state aviation department for quick and transparent decision making.

**SP's: What are the factors that determine setting up of civil aviation department in respective states?**

**Chauhan:** The state of Gujarat has a total of 17 airports of which nine are

aero sports, intra-state connectivity, MRO development, disaster and rescue operation and a training academy, etc. GUJSAIL is planning to develop, only one of its kind, an "Aviation Park".

**SP's: There are many projects which are outlined in the GUJSAIL policy but yet to be implemented. What are the main reasons for the delay in its execution?**

**Chauhan:** Airport projects are capital intensive with long gestation periods. There are issues of land acquisition, environment clearance, funding, complex jurisdiction boundary issues, etc, which cannot be done in a hurry. Therefore, after the framing of any policy and necessary approval, it takes a while for the actual implementation.

**SP's: What are the developments you have undertaken?**

**Chauhan:** I took over in 2004 and since then have set up GUJSAIL to facilitate the infrastructure needs of companies and airline operators coming to Gujarat. I have facilitated construction of helipads in all the districts of Gujarat; Constructed a new helipad at Civil Hospital, Ahmedabad; purchased refuelling bowser-cum-weather station; tied up with IndiGo to offer special fares to government officials; acquired land for 11 airstrips, etc.

**SP's: How do you differentiate Gujarat with other states of India in terms of implementing policies for civil aviation?**

**Chauhan:** Gujarat continues to outpace growth in other states of India. The state has incorporated "single window clearance" system for taking necessary clearances. Our government has a positive approach towards any new development and always supported our foundation.

**SP's: What message you would like to share with young pilots/aviators?**

**Chauhan:** Being a pilot, I would like our young pilots to recall a famous saying "A pilot lives in a world of perfection or not at all", which implies that pilots are supposed to be perfect in the aviation field. Aviation always delivers the biggest thrills. I would like to tell the new breed of pilots that they should remain passionate about flying and take guidance from their families, close friends, especially from senior and experienced persons from the aviation sector. •



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# India Aviation 2016 Dates Announced

India Aviation 2016 would be the largest International Exhibition & Conference on Civil Aviation industry in India. The bi-annual event, organized jointly by the Ministry of Civil Aviation, Govt. of India and FICCI is hosting its 5th edition from March 16-20, 2016 at Hyderabad. The event has the support of Airport Authority of India, BCAS, DGCA, Air India, Pawan Hans and many Industry associations. Civil Aviation is a key infrastructure sector that facilitates the growth of business, seamless flow of investment, trade and tourism, with significant multiplier effects across the economy. Over a third of world trade by value is delivered by air and about half of international tourism is facilitated by air links. Aviation has created a global community based on the connectivity it provides. In a world of decreasing barriers to trade, the civil aviation industry remains a unique engine for innovation and technological progress, one that provides infrastructure that keeps the nation competitive. Rapidly expanding air transport network and opening up of the airport infrastructure to private sector participation have fuelled the growth of the air traffic in India. One of the most important objectives behind organizing the India Aviation series is to promote the manufacturing in the Civil Aviation industry, highlight the investment possibilities and to give impetus to make in India Policy of Govt. of India.

The theme of the Event is 'India's Civil Aviation Sector: Potential as Global Manufacturing Hub'. Besides showcasing the strength of Indian Civil Aviation industry, India Aviation 2016, would also serve as major platform for one to

one business meetings between foreign and Indian companies, renewing past relations and generating new business such as joint venture collaborations, technology exchanges, tie ups and of course, attracting investment in the Indian industry.

India Aviation is the most comprehensive event on Civil Aviation Industry that includes Exhibition, Conference, Chalets, Demonstration flights, CEOs' Forum, Static Display, Aerobatics, Media Conferences, one-to-one business meetings etc. The previous edition of India Aviation in 2014 received overwhelming response from the industry with USA coming as the Partner Country and France as the Guest Country at the Event. The event witnessed the participation from more than 200 Exhibitors from India and Internationally with over 25 Aircrafts like A-380 and Boeing Dreamliner at the Static/ Flying display. Concurrent events like Inaugural Ceremony, International Conference, CEOs' Forum, Bilateral Meetings, Theme Pavilion and Networking dinner were some of the highlights of the Show.

India Aviation 2016 is all set to surpass the landmark created by its previous edition and will witness a larger participation from International and Indian Companies from the sectors. We would like to take this opportunity to invite the companies to participate at India Aviation 2016 and tap the potential in Civil Aviation market. For more details, you may also visit [www.india-aviation.in](http://www.india-aviation.in).

## Snecma and HAL to Create a Joint Venture and Build a New Production Facility in India



Snecma (Safran), a leading manufacturer of aircraft engines, and Hindustan Aeronautics Ltd. (HAL), a leading aerospace manufacturer, signed a Memorandum of Understanding (MoU) on January 28, 2015 in Bangalore to explore establishing a joint venture in India for the production of aero-engine parts. The MoU was signed by Mr. Bruno Durand, Vice President for Industrial Operations & Supply Chain of Snecma and Mr. Arunachalam Muthukumaraswami, General Manager of the Engine Division of HAL.

The proposed joint venture will initially focus on the manufacture of high-tech parts for the Dassault Rafale's Snecma M88 engine, then subsequently contribute to other major aerospace projects of HAL & Snecma, in India and worldwide. Spanning over 30,000 square meters, the proposed joint venture's new plant is expected to benefit from substantial investment by the two partners, providing it with state-of-the-art machinery and equipment.

This agreement marks a major step forward in the long-standing collaboration between Snecma and HAL. The proposed joint venture will further broaden the scope of the excellent relations established over the past 60 years between Safran affiliates and the Indian aerospace industry. For example, Snecma manufactures the M53 engines powering the Mirage 2000H "Vajra" fighters operated by the Indian Air Force.

"This new partnership clearly reflects the close relationship established over many years between Snecma, our parent Safran and the Indian aerospace industry," said Pierre Fabre, Chairman and CEO of Snecma. "We are strongly committed to contributing to the 'Make in India' policy, based on ambitious partnerships and extensive direct investments. This new venture is further proof that we are actively strengthening our existing ties with HAL."

## Astra Microwave - 'Make in India' Partner for manufacture of Strategic Electronics

Hyderabad based Astra Microwave Products Ltd. has posed itself as the manufacturing partner for foreign OEM's looking to Make their Products in India and supplying to the swiftly increasing demands of defense forces in India for modern equipment. With offsets taking a backseat in the policy domain of the Government of India and the present Government pushing for "Make in India", many of the future defense procurements are expected to move in this direction. The firm is therefore well placed in positioning itself as a partner for manufacturing strategic electronics for major foreign OEM's that are eyeing the high capital spending of the Indian Armed Forces.

Astra Microwave has expanded its operations to Bangalore as announced in the previous edition of Aero India and has also set up office in Delhi to work on the futuristic requirements of the Indian Ministry of Defense, eyeing opportunities to produce smaller defense systems in collaboration with foreign equipment manufacturers. The company has invested heavily into infrastructure and has been supporting the Defense Research Development Organization, Indian Space Research Organization and the Defense Public Sector Units for Strategic Electronics that form part of Radar Systems, Electronic Warfare Systems, Telemetry Systems and Satellite Systems. Having worked in various programs of Indian Defence, supplying strategic electronics in the form of sub-systems and components, the company is already working in the high technology domain.

The company believes that with their technological ability on the sub-system level combined with the expertise of foreign OEM's, they can support the requirements of the Indian Armed Forces under the Buy and Make Indian category. It is only logical then, that Astra Microwave poses themselves as an ideal partner to Foreign OEM's for "Making their products In India".

Astra Microwave was also one of the first beneficiaries of the Offset program having won the very first offset contract to be signed along with L&T. Since then they have been working consistently with foreign OEM's on offset programs and have delivered high end modules in high quantity meeting the quality and delivery benchmarks. This combined with their strong presence in the Indian market making the company ideally poised to go on further and become a strong player in the Buy and Make Indian category of Defense Procurements.



## IRKUT to Complete Su-30MKI Kit Deliveries to India in 2015

IRKUT Corporation of Russia will complete deliveries of Su-30MKI aircraft kits to Hindustan Aeronautics Limited (HAL) during 2015. In total, IRKUT Corporation will have successfully delivered 222 aircraft kits for assembly at (HAL) Nashik plant. Currently HAL is in Phase IV of assembly which means it is manufacturing parts from the raw material stage with complete transfer of technology from IRKUT Corporation. The Su-30MKI programme is a shining example of India-Russia defence cooperation.

HAL has also mastered the overhaul of Su-30MKI programme and delivered the first overhauled aircraft to the Indian Air Force (IAF) at the end of 2014. To master the whole scope of overhaul procedure is a real challenge with the overhaul technology documentation having been developed by HAL specialists. We at IRKUT supplied the overhaul equipment and assisted in their installation and shared with HAL our experience in such work.

Going forward we envisage further evolution of the Su-30MKI joint program. The integration of the Brahmos supersonic cruise missile onto the Su-30MKI to force-multiply its strike capability is being done in India. The up-gradation of the Su-30MKI aircraft for significant enhancement of its combat and operational capabilities is being positively considered by both sides. •

## Israel Pavilion Displays Top-notch Technologies

SIBAT - the International Defense Cooperation Directorate of the Israel Ministry of Defense (IMOD) – is presenting various top-notch military and civil aviation technologies at the Israel National Pavilion. Air defense and air-borne ISR technologies for the military sector – and avionics, communications, and airport technologies for the civilian market are the highlights.

According to Brig Gen (Retd) Mishel Ben Baruch, Director of SIBAT, "Israel is strengthening its ties and expanding technological collaboration with India, a country with exceptional R&D capabilities. In the military field, Israel and India share common threats. The technological cooperation between the two countries significantly benefits both, enabling us to better counter these threats – with Israel ready to share its experience and operationally-proven, cutting-edge technologies with India".

He continued, "India has an immense civil aviation market, which includes numerous airports. Israeli companies participating in the Pavilion look forward to presenting their solutions, which are contributing substantially to global air safety and efficient management of airport". The Israel National Pavilion is displaying a wide range of technologies designed for both military and civilian markets. In the military field, solutions for the escalating defense and intelligence challenges – including air defense technologies for all layers; intelligence technologies, communications, and surveillance solutions etc. •

## Boeing Awards Titanium Forging Contract to India's Bharat Forge

Boeing announced it has signed a multi-year contract with Bharat Forge of India to supply titanium forgings for wing components for the Next-Generation 737 and 737 MAX. Under the agreement, Bharat Forge will begin supplying pre-machined forgings from its facilities in Pune and Baramati to Boeing in the first quarter of 2016. The titanium parts will be heat-treated, shaped in a forging press, and machined by Bharat Forge before being shipped to Boeing Portland for finish machining into components. The components then will be installed in the Next-Generation 737 and 737 MAX wings at the Final Assembly plant in Renton, Wash.

"We are pleased to welcome Bharat Forge into our supply chain as they have an impressive record of performance across many industries," said Kent Fisher, vice president and general manager, Supplier Management, Boeing Commercial Airplanes. "Our discussions with Bharat Forge Chairman and Managing Director Baba Kalyani and his leadership team leading up to this agreement have demonstrated not only a high level of technical expertise, but also an understanding of the need to meet aviation market requirements for affordability."

The contract reinforces the Boeing supply chain strategy to expand our forging supply base through partnering with high performance companies like Bharat Forge. This reduces risk and introduces new players into our supply chain to ensure capacity and competitive cost, Fisher said. Boeing currently has forging contracts with suppliers in Asia, Europe, Russia, and North America and will continue to add new sources of forgings around the world.

"This contract demonstrates our accelerating engagement with Indian suppliers to scale-up aerospace manufacturing aligned with the Prime Minister's 'Make in India' initiative," said Pratyush Kumar, president, Boeing India.

"The partnership with Boeing highlights our capabilities in titanium forg-



ing and our unwavering commitment to offer high end technology and tangible value in the aerospace sector," said Kalyani. "We have mastered the stringent process requirements for titanium forgings and will be supplying critical forgings for wing components in one of Boeing's high volume products. This also confirms our resolve to meet the aspirations of the 'Make in India' drive." •

## Parrot Uses Dassault Systemes'

Dassault Systemes, the world leader in 3D design software, 3D Digital Mock Up and Product Lifecycle Management (PLM) solutions, announced that Parrot, developer and marketer of advanced technology wireless products for consumers and professionals, has used its Solidworks Industrial Design application to successfully design complex 3D shapes for a future line of drones.

This application delivered significant social collaboration benefits to Parrot's engineering and design teams through its use of Dassault Systemes' industry-leading cloud-based capabilities. "SOLIDWORKS Industrial Design enabled us to develop an innovative idea in a record amount of time, without being derailed by challenges inherent to traditional design software," said Henri Seydoux, founder and CEO of Parrot.

Drones, or unmanned aerial vehicles, are a burgeoning industry for rea-

sons ranging from pure consumer enjoyment to potential applications in commercial and military sectors. Technological enhancements to structure, weight, stability, size, maneuverability and power are crucial for a drone's appeal in the marketplace.

"Parrot has used Solidworks applications for more than 10 years to design a range of high-tech products and we were convinced that Solidworks Industrial Design would complement and add value to these existing Solidworks projects," said Gian Paolo Bassi, CEO, Solidworks, Dassault Systemes. "Parrot is among the first customers worldwide to use this software through a preliminary testing program, and seeing their drone designs come to fruition is testimony to this application's potential opportunities in the engineering and design world." •

# BAE Systems' Underscores Commitment to 'Make in India'

Debuts APKWS Rocket at the Biennial Show

BY SP'S CORRESPONDENT

Encouraged by Prime Minister Narendra Modi's call to 'Make in India', BAE Systems' showcase at the tenth edition of Aero India extends its 'Make in India' commitment to a range of platforms and technologies. Building on the success of its flagship programme in India on the Hawk advanced jet trainer, the company's pavilion emphasizes the continued development of Hawk's training, performance and operational capabilities. Marking the company's continued progress in partnering the Bharat Electronic Limited in the country's first 'Make in India' programme, tactical communications systems, the pavilion will dedicate a section to the "Internet for the battlespace" or secure, deployable broadband voice, data and video communications systems.

India is the largest operator of the Hawk advanced jet trainer with 123 aircraft ordered to date, of which over 90 have been delivered to the Indian Air Force and the Indian Navy. The Indian Hawks in service have clocked up over 75,000 flying hours. BAE Systems has commenced contract negotiations

S3000 and Mission Adaptable Crew Seats (MACS). The Striker helmet-mounted display (HMD) too will be present at the show. Now in service on the Euro-fighter Typhoon, the Striker provides comfort, protection, and helmet stability for both fixed- and rotary-wing platforms such as the light utility helicopter (LUH), Apache and the light combat helicopter (LCH).

In addition on display will be Broadsword SPINETM, connected electronic equipment for the clothing of armed forces, fire and rescue services, and law enforcement.

## EXCELLENT PLATFORM

Leading BAE Systems' participation at South Asia's premier airshow is Chris Boardman, Managing Director, Military Air and Information; along with Stephen Timms, Managing Director Defence Information, Training and Services; John Brosnan, Managing Director, India and South East Asia; Dean McCumiskey, Director, Business Development, Military Air and Information; Michael Christie, Director Strategy & Market Development and Chief Technologist; and Mark Simpkins, Vice President and General Manager, India.



THE INDIAN HAWK; (RIGHT) THE STRIKER HMD

with the Hindustan Aeronautics Limited (HAL) on a potential order to supply products and services for the manufacture of a further 20 Hawk aircraft. The aircraft, to be built by HAL in Bengaluru, will fulfil the Indian Air Force's requirement for its prestigious aerobatic team.

Making its debut this year is the Advanced Precision Kill Weapon System (APKWS™) rocket. Developed as a highly cost-effective solution that leverages the military's existing infrastructure and inventory, the APKWS rocket turns a standard unguided 2.75-inch (70 millimetre) rocket into a precision laser-guided rocket to give warfighters a low-cost surgical strike capability. Currently in its third year of full rate production, the APKWS rocket has been successfully demonstrated on more than a dozen fixed-wing and rotary-wing platforms including AH-64 Apache, the F-16, the Bell 407, and the AH-1W. Building on in-theater success by the US Marines, the APKWS rocket has been chosen by the Kingdom of Jordan for its CASA-235 light gunship aircraft.

The company's showcase this year has an array of equipment targeted towards India's rapidly expanding military helicopter fleet. This includes the

Chris Boardman, said, "We have a long history of working with industry in India. Through our various programmes we have worked closely together to develop skills and capabilities in the defence industry. Our commitment to this will not change and India remains central to our future strategy."

John Brosnan, said, "The backdrop of 'Make in India' at the show this time makes it an excellent platform for us to strengthen existing partnerships and activate new ones."

BAE Systems is one of the world's leading defence, aerospace and security companies, with more than 80,000 employees across six continents. We serve the needs of our customers by delivering a wide range of advanced defence, aerospace and security solutions that provide a performance edge. We work together with local partners to develop, engineer, manufacture and support the innovations that increase defence sovereignty, sustain economies and safeguard commercial interests. We are committed to creating solutions that protect and strengthen nations, commerce, communities and people. •

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