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[inside]

PHOTOGRAPH: Anthony Bari Jr

BULLISH INDIAN AEROSPACE: Red Bulls aerobatic team thrills for the first time at Aero India 2011

MMRCA commercial talks in a week: Air Chief

By **VISHAL THAPAR**

Commercial negotations in the MMRCA tender will start in a week or two, Chief of Air Staff, Air Chief Marshal P.V. Naik declared on Thursday. He expects the contract for 126 fighters signed by September 2011.

"The offsets problems have been sorted out. Unless dissatisfied vendors put a spoke in the wheel, I'm sure the contract will be signed by September" Air Chief Marshal Naik said while addressing a press conference. The Air Chief dismissed reports that the Offsets part of the deal was in disarray. This is the biggest ongoing global tender for fighter aircraft. On Wednesday, Defence Minister A.K. Antony had declared that the deal would be clinched by the end of the financial year 2011-12, but the IAF Chief's statement suggests that there's pressure on the Government to wrap up the deal even quicker.

In another significant announcement, the Deputy Chief of Air Staff, Air Marshal R.K. Sharma said commercial negotiations for the upgrade deal for 51 IAF Mirage-2000 aircraft have been concluded. "It'll be our best effort to sign the contract by the end of the financial year 2010-11," he said. The deal is now being vetted by the Ministry of Finance. While Chief Naik admitted that "price was an issue", while responding to queries about the delay in the contract, his deputy blamed the delay on "negotiations related to contractual clauses". The IAF expects this upgrade to make the Mirage-2000 fleet relevant for another 20 years. The upgrade package includes a glass cockpit, new radar, state-of-the-art avionics, senors and EW suite as also new weapons.

Air Chief Marshal Naik also announced that India would order 50 more Mi-17 V-5 helicopters from Russia. Delivery in the earlier contract for 80 of these medium-lift helicopters will start this year. Giving the status on the helicopter induction, he said 12 AW-101 VVIP choppers will be delivered to the IAF shortly. Flight evaluation reports in tenders for 197 Light Utility Helicopters - in which the Army is the lead service – and the 22 attack helicopters will be ready in a week from now. In the heavy lift category, in which the Chinook and Mi-26 are in contention, the trial evaluation is yet to start.

Bids by Rolls-Royce and Honeywell for the reenginging of the Jaguar deep penetration strike aircraft are expected by the end of this month. This tender involves the re-engining of 60 IAF Jaguars. It will involve the series production of 200 engines at HAL. Also, the Jaguar will be the first IAF fighter to be equipped with sensor-fused weapons being acquired from Textron.

The final evaluation report for 180 basic trainers

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CAE simulation & training presence growing in India

JEFF ROBERTS
CAE

to replace the grounded HPT-32 has been submitted to the Ministry of Defence, and commercial negotiations should begin in a month or two.

The IAF wants an AESA-type radar on its Sukhoi-30MKI fleet. Plans are being worked out for an upgrade package. On the other end of the spectrum, the last squadron of the oldest of the MiG-21 fleet, the Type 77, will be phased out in a few days. Air Chief Marshal Naik said the IAF expects to begin recouping its squadron strength from 2014-15.

On comparisons between the Chinese J-20 and the Indo-Russian Fifth Generation Fighter Aircraft (FGFA)-in-the-making, he said a lot more conformation is required of the J-20's capability. "I've just seen a photo and a report," the IAF chief quipped, while reiterating the 2017 deadline for the induction of the FGFA. "We plan to induct 200-250 of these fighters, if not more," he added. There are no proposals for Sino-Indian air exercises.

On the indigenous Light Combat Aircraft (LCA), the Air Chief acknowledged that there are some quality issues which still remain to be sorted out. "Quality definitely is a concern. We are in regular dialogue with HAL to resolve these issues before the aircraft enters squadron service," he said.

The Initial Operational Clearance of the Intermediate Jet Trainer is expected by July. Spinning trials will start in one or two months. "We would also want the IJTs to be flown by the Surya Kiran Aerobatics Team," he said.

The Air Chief strongly supported international collaborations to speed up development of defence systems. "We need collaboration in some areas to get to the next stage, the cutting-edge stage," he said.

In partnership with the Indian Space Research Organisation, the IAF has planned a series of satellite launches over the next 15 years to beef-up its surveillance capability and networking requirements. •

Thumbs Up !

SP's Aviation Editor Air Marshal (Retd) V.K. Bhatia endorses Super Viper

In March 1995, I first flew the F-16 and eleven years later I was in the cockpit of the latest version of F-16IN Super Viper and all I can say "what a difference". Outwardly, the two aircraft look the same, except for the conformal fuel tanks. When I entered the cockpit, the difference was all so visible.

First and foremost, the aircraft can do much more than the earlier model. The heart of the whole cockpit is the AESA radar APG-80. It has great and unique capability. I could simultaneously view air-to-ground, air-to-air and terrain mapping modes. The situational awareness is vastly improved. All the information is on the tactical situation display wherein one can engage air-to-ground target, look at threats on ground, aerial threats and also evade ground-to-air attacks. Another feature is the data link. The AESA radar, if selected it would get linked with the Indian Air Force's Operational Data Link (ODL). The conformal tanks with additional fuelling gives highly extended range of flying.

Training of pilots will be much easier, bringing down the workload substantially. It has an auto-throttle too which enables you to fly hands-off !

Considering all these, I believe the Super Viper will be a serious contender in the MMRCA race. •

Herculean ride!

SP's AirBuz Editor Air Marshal (Retd) B.K. Pandey finds WC-130J's minimum take off capability a clincher

A group of journalists were taken aboard the WC-130J Hercules Weatherbird for a short flight at Yelahanka. A product from US aerospace major Lockheed Martin, the aircraft is modified and equipped to penetrate tropical cyclones and hurricanes at altitudes ranging from 500 to 10,000 feet above the ocean surface.

Specialised equipment onboard the aircraft collect high density, high accuracy weather data from within the storm's environment for which the aircraft is required to penetrate the "eye of the storm". The information is transmitted via satellite in real time to the National Hurricane Centre to aid in the accurate forecasting of hurricane movement and intensity. A hazardous task indeed!

In the short flight, the pilot demonstrated minimum distance take off capability, steep climb out and ease of handling. But perhaps the most impressive part of the exercise was the steep approach followed by a short field landing. With all engines in reverse thrust and powerful braking, the aircraft came to a stop in just a few hundred meters. The Indian Air Force has already received the first of the six C-130J Super Hercules customised for Special Operations. This aircraft is on static display. •

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The CH-47F Chinook is the most versatile, mission-capable heavy-lift helicopter in the world. More powerful than ever with advanced flight controls and avionics, the CH-47F is in a class by itself, whether it's transporting troops and equipment, on deep combat assault, performing search and rescue, or delivering disaster relief. Extraordinary performance—it's what you expect from Chinook.

BOEING

PHOTOGRAPH: Neetu Dhulia

BEML – An impressive take-off

BY **NEETU DHULIA**

BEML Aero space Division which just under two years, takes off to new heights. BEML Chairman and Managing Director V.RS. Natarajan's decision to diversify its business has paid off well. In December 2002, V.RS Natarajan took over as the Chairman and Managing Director of BEML, a company with a turnover of Rs 1,424 crore, and turned the company around. The company has drawn up Vision–2013 with an ambitious growth rate of 12 per cent CAGR for crossing Rs 5,000 crore turnover by 2013-14 coinciding with BEML's Golden Jubilee year. With this emerging prospects, BEML has plans to cross Rs 5,000 crore in the next two years and is poised to achieve Rs 10,000 crore mark by 2016-17 and the company is gearing up with necessary infrastructure for achieving the same

BEML operates on three major business verticals for associated equipment manufacturing—mining and construction, rail and metro and defence. The company aggressively looks at all the verticals of the defence sector. Present in the land and air, BEML is now eyeing the Navy too.

Participating in the fourth edition of Aero India, Natarajan said, 'The opportunities are irresistible in aerospace." Plans are afoot to make a full-fledged aerospace manufacturing facility operational soon and to effectively meet the offset obligations/requirement of the aerospace industry, which is growing at a phenomenal rate.

The plant would come up on a 25-acre plot in the aerospace special economic zone at Devanahally on city outskirts, this manufacturing facility is expected to be operational in 2012-13," said Natarajan.

He shared, "The aerospace division manufactures aircraft towing tractor (ATT) capable of towing the A-380, auto weapon loader (ATT) for the IAF, gears for ALH–Cheetah and Chetak helicopters, jigs for aircraft structures, machining of aerospace components, fabrication of structural sub-assemblies for Su-30 aircraft and a variety of ground support and ground handling equipment.

On being asked if they are gearing up to compete with HAL, Natarajan clarified, "HAL is the leader. We wish to complement HAL and share work. If a private entity can gain from HAL, why should'nt BEML?" •

Boeing sees great possibilities of collaborations in India

"India is a great market to be and there are great possibilities of collaborations," said Mark Kronenberg, Vice President, International Business Development, Boeing Defense Space and Security. In an interaction with SP's Show News, he informed that Boeing is working on agreements with 58 companies. "The tie up with Hindustan Aeronautics Limited (HAL) on the $1 billion programme 10 years will help the F-18, P8I and many other programmes," said he. He expressed great hope on Boeing wining the medium multi-role combat aircraft (MMRCA) programme. The Super Hornet has proven its capability in United States Air Force. He further spoke about the F-22 programme wherein Boeing and Lockheed Martin have come together. •

HAL to deliver 1,500 helicopters in next five years

On the second day of the Aero India 2011 international air show, aerospace major Hindustan Aeronautics Limited made its intent clear of capturing as much aerospace business as possible in the coming years, through various new programmes. It is awaiting the completion of the MMRCA deal and other defence aviation acquisition programmes in which it is to partner.

Today, HAL handed over the first five Advanced Light Helicopters (ALHs) Dhruv, Mark III. The first five ALHs of the 159 ALH programmes, with more powerful Shakti Engine, were delivered to the Army Aviation which is expected to be the "future arm" of the Indian Army.

HAL's massive plans include 1,500 helicopters, both ALH and LCH, in the next five years. The officiating chairman, Shivamurthy, who is also the Director, Finance, said that HAL will design, develop and manufacture these helicopters with about 80 per cent indigenisation. The raw materials are imported.

The global major has also finalised the plans for a joint venture development of the Multi-Transport Aircraft of 20 tonne capacity for deliveries to begin in 2016-17. This is in partnership with Russia. The other major programme is the fifth generation fighter aircraft (FGFA) with Russia for induction into the Indian Air Force by 2017. Presently, it is in the design collaboration stage with the design ratio being 35:65 (HAL 35 per cent). The total development cost is put at $6 billion.

For the Naval variant of the LCA, ground integration is going on and the prototype will be ready in about eight weeks time. To keep HAL's programmes abreast, the company is investing between eight and 10 per cent in R&D.

With all these programmes, HAL will be spending about Rs 20,000 crores in the next 10 years. Presently, it has a reserve of Rs 9,000 crores and will be adding Rs 1,500 crores each year. "There is no need for us to borrow." HAL has been planning to go on the stock market, but the decision has been pending with the government for quite some time. Having reserve money and also the capabilities, he said, will further bring down the cost of design and engineering. •

Boeing to deliver 787 Dreamliner by year end

There is finally some good news from Boeing Commercial Airplanes, a wholly owned subsidiary and business division of parent The Boeing Company.

At a media briefing at Aero India 2011, Dr Dinesh A Keskar, President of Boeing India made the long awaited announcement that the first of the 27 Boeing 787 Dreamliner ordered by Air India will be delivered in the fourth quarter of 2011. Dialogue is on between the airline and Boeing on the schedule for further delivery. First delivery to the launch customer Air Nippon Airways is scheduled to be made in the third quarter of this year.

Boeing sees India's expanding industry to be the fastest growing in the world driven by a resurgent economy. With passenger traffic in India growing at 15 per cent annually, a healthy balance has been restored between demand and supply and all of India airlines are now recording operating profits.

Estimates by Boeing are that the Indian airline industry will need around 1150 commercial jets valued at $130 billion over the next 20 years. This represents a little over four per cent of Boeing's global demand forecast. However, the optimism could be seriously threatened or undermined by unbridled inflation and undue volatility in fuel prices. Boeing will however, sustain its efforts at partnership with Indian carriers to optimize their growth and competitive advantage. "The Boeing 787 Dreamliner is a game changer that will give our customers a clear edge" said Dinesh Keskar.

Currently, the company has orders for 847 Boeing 787 Dreamliners from 57 customers spread across the world. Boeing, the leading aerospace company and the largest manufacturer of commercial jets and military aircraft has progressively enhanced its presence both in the civil and military aviation markets. •

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Lockheed Martin keeps finger crossed on MMRCA

BY **SUCHETA DAS MOHAPATRA**

"The request for proposal (RFP) for the medium multi-role transport aircraft (MMRCA) programme did not specify the requirement for a twin-engine programme," said Oriville Prins, Vice President, business Development India, Lockheed Martin reacting to media query about Lockheed Martin's stand on the debate on single-engine versus double engine programme for the MMRCA deal. "There may be issues like cost factor or political issues, but single engine is not an issue," he said.

Interacting with the media at the Aero India, Prins said, "The safety record of single engine is as good as twin engine. Furthermore, a single engine reduces life cycle cost of the aircraft." Explaining about the company's varied programmes in India including the C-130J already delivered to the Indian Air Force, the F-16IN Super Viper and the fifth generation F-35 programme, Prins denied claims that the F-35 programme offered by the US was following the Indo-Russia fifth generation fighter aircraft (FGFA) programme. He further clarified that both the Ministry of Defence and the IAF are committed to the MMRCA programme and there is no question of cancellation of the programme.

Besides having many celebrities and retired air warriors flying the F-16IN, the company has put the cockpit on static display at the Aero India show. •

Grob trying to grab trainer market

BY **NIRMALA RAO**

Grob is pitching hard in India for its G120TP basic trainer aircraft. Designed specifically to meet demanding military standards, the aircraft are suited to both basic and advanced military training, the perfect foundation for more advanced training in either turboprops or jets. The initial complementary G 120developed for high-performance training and aerobatics is undergoing a new avionics upgrade to Facilitate the current industry trend.

Andre Hiebeler, Grob Chief Sales Officer and co-CEO said the German firm is making its presence felt here and awaiting the results from Indian authorities on selection of the basic trainer aircraft. Grob Aircraft operates under the corporate umbrella of H3 Aerospace. The production of the light weight G 120 TP planes for India, are bang on schedule, according to Jan Krablsko, COO, Grob Aircraft. Hiebeler said India is a big market, but a difficult one. He said they could offer turnkey projects, jet training being the most sought after. The Grob G 120 TP will replace HAL's HPT-32 Deepak aircraft. Training flights have graduated from the Typhoon, Hawk 128, Kiran aircraft to Deepak. Now it is time to phase this too.

There is a market for 1,200-2,400 basic and elementary trainers in the next 15-20 years, and Grob is looking at selling 40-50 a year across the world. The German company is hoping that it would make a breakthrough in India which then would open up other markets. •

Raytheon completes first series of laser-guided Maverick captive flight testing

Raytheon Company completed a series of initial captive carry flight tests of the AGM-65E2/L, the newest variant of the laser-guided Maverick missile. The laser-guided Maverick missile is a direct-attack, air-to-ground precision munition used extensively by the US Air Force, Navy and Marine Corps in ongoing combat operations.

"The combat-proven laser-guided Maverick is an ideal weapon for urban combat and high-speed maneuvering targets, both on land and at sea," said Harry Schulte, Vice President of Raytheon Missile Systems Air Warfare Systems product line. "With more than 33 customers around the globe and certified on more than 25 aircraft, Maverick is clearly the warfighter's weapon of choice for direct-attack precision engagement."

The AGM-65E2/L will have an enhanced-laser seeker and new software that reduces the risk of collateral damage and enables aircraft to use onboard, buddy and ground-based lasing to designate targets. During the tests, which took place in the fourth quarter of 2010, the Maverick's laser-seeker locked on to a variety of stationary and moving targets from distances as far as 28 kilometers (18 statute miles). The tests were conducted on the F/A-18, F-16, and A-10C fighter aircraft. •

*Number affected globally by climatic crises by 2015 – projection from oxfam.org.uk

Multifunction Plane

The C295 provides wide versatility and flexibility, meeting required performance at low costs

Airbus C295 is a multifunction aircraft that operates into short, unimproved runways. It is extremely effective in operating in austere, remote airfields, and in adverse weather conditions and has exceptionally low fuel-consumption. In operations in Kosovo, Iraq and Afghanistan, it has demonstrated exceptional mission flexibility and rapid cargo-space reconfiguration. While flying these military missions, it has completed live day/night, poor weather, and austere field operations. C295 is a developed version of the well-known CN235, offering greater capacity and range. Both have become the best selling aircraft in their market segment. Offering a similar level of reliability and supportability in operations as the proven CN235, the C295 aircraft is combat proven and has successfully completed missions in hot and high altitude conditions, desert, maritime, and cold/icy conditions, especially in support of the global war on terrorism in Iraq and Afghanistan.

C295 is able to carry up to nine tonnes of payload and with a maximum cruise speed of 260 kt (480 km/h), the C295 is a new generation aircraft with a retractable landing gear and a pressurised structure enabling it to cruise at 25,000 ft. Powered by two Pratt & Whitney Canada PW127G turboprop engines, the C295 provides outstanding hot and high performance, low fuel consumption and consequently a very long range/endurance. It's simple design and robustness, reliability, excellent flying qualities, great versatility enable it to offer the lowest operating costs in its category, including fuel and maintenance.

The type's STOL capabilities combined with a strong landing gear enable the C-295 to operate in the most austere locations with the worst conditions for take-off and landings. The aircraft is a tactical military transport with a light footprint to enable operations from soft (CBR 2) unprepared airstrips. The C295 is designed to provide outstanding low-level flight characteristics for tactical missions. The standards used in design and construction combine the ruggedness, strength and durability required by military operation with high levels of safety and reliability required by civil regulations.

The C295 is fitted with the highly integrated avionics system (HIAS), an advanced integrated avionics system based on the Thales Topdeck Avionics suite. The flexible architecture concept and the use of dual technology civil/military equipment ensure success on demanding tactical missions, growth potential for future equipment as well as compatibility with the latest civil airspace environment.

The C295 glass cockpit avionics core includes four large active matrix liquid crystal displays (6"x8"), fully compatible with night vision goggles. The advanced integrated avionics system with multifunctional displays provides improved situational awareness and flight safety, lower pilot workload and enhanced mission effectiveness. The C295 has the longest unobstructed cabin (12.7 m) in its class. It can accommodate up to 71 seats for personnel transport, offering a much higher capability of personnel transportation than its competitors in this segment. For the same reason, it can carry much more palletised cargo (up to five 88" x 108" standard 463L pallets) with direct offloading through its rear ramp door.

The C295 provides wide versatility and flexibility, meeting required performance at low costs and from small, unpaved airfields, with a continued through life support service. The aircraft performs any type of mission—from personnel, troop and bulky/palletised cargo transportation to casualty evacuation, communication and logistic duties or certified air-dropping capabilities, with the lowest configuration change time, thus reducing the risk of exposure when operating in hostile environments. •

CAE inaugurates its new aerospace and defence complex in India

CAE officially inaugurated its new aerospace and defence complex in Bengaluru today in the presence of representatives of India's airlines and defence forces, Canada's High Commission to India, as well as company executives and employees. Located close to Bengaluru International Airport, the complex is headquarters for CAE's operations in India and home to a majority of its India-based employees.

In the 1,16,000 square-foot complex, CAE designs and develops defence training systems for India's defence forces and operates an engineering centre of excellence where visual databases and other software components for CAE's simulators are developed. The facility also houses CAE's Bengaluru aviation training centre, the first independent aviation training centre in India. The six-bay capacity centre currently offers Airbus A320 and Boeing 737 pilot training on three CAE-built full-flight simulators. More than 1,500 pilots trained at the centre last year, including pilots from Indian-based airlines such as Air India, Go Air, IndiGo, Kingfisher Airlines, Spicejet and commercial pilots of the Indian Air Force. Other customers include Fly Wings Aviation and Sri Lankan Airlines. The training centre is part of the CAE-Airbus Training Services Cooperation agreement.

India is of strategic importance to CAE and the new aerospace and defence complex demonstrates the Company's commitment to India. CAE has been active in the Indian market for the past 40 years, starting with the sale of simulators, and now offers comprehensive training solutions for India's civil aviation and defence markets. CAE's workforce in India has grown from 13 employees in 2004 to more than 300 today.

In addition to the new aerospace and defence complex, CAE has made a number of significant and strategic investments in India for both the civil and military markets. The company owns jointly with the Government of India the National Flying Training Institute (NFTI) in Gondia, a newly established ab initio flight school that is one of 11 CAE Global Academy campuses worldwide. CAE is the managing partner of the Indian government's Indira Gandhi Rashitrya Uran Akademi (IGRUA) flight school located in Rae Bareli, also part of the CAE Global Academy network. CAE also owns jointly with Hindustan Aeronautics Limited (HAL) the Helicopter Academy to Train by Simulation of Flying (HATSOFF), India's first advanced helicopter training centre, located in Bengaluru.

"India is home to one of the fastest growing civil aviation markets in the world, and through our flight schools and pilot type-rating training centre as well as the sale of comprehensive training solutions, CAE is a partner in this growth," said Jeff Roberts, CAE's Group President, Civil Simulation Products, Training and Services. "The Indian commercial aircraft fleet has nearly doubled since 2003 to about 600 aircraft in 2010, and Indian carriers have more than 350 commercial aircraft on firm backlog. That translates into a need for approximately 6,000 new pilots in India over the next seven years."

CAE has delivered approximately 70 percent of the installed base of civil full-flight simulators in India, and CAE India Pvt Ltd, formerly Macmet Technologies, has been providing leading-edge simulation solutions to India's defence forces for more than two decades.

"With the Indian defence and homeland security forces in the midst of a rapid and widespread modernisation effort, they are in a perfect position to extend their use of simulation to help ensure their forces are well-prepared and mission ready to meet new threats and challenges," said Martin Gagné, CAE's Group President, Military Products, Training and Services. "Simulation offers a range of benefits and advantages for accomplishing training and mission rehearsal objectives, and CAE is committed to long-term partnerships and support in India."

Didier Lafrique, Head of Airbus Training India, who was also a speaker at the event, said, "Thanks to our training cooperation with CAE, we can offer A320 pilots based in India and the surrounding region the advanced training services they require right at their doorstep."

CAE is a world leader in providing simulation and modelling technologies and integrated training solutions for the civil aviation industry and defence forces around the globe. With annual revenues exceeding C$1.5 billion, CAE employs more than 7,500 people at more than 100 sites and training locations in more than 20 countries. CAE has the largest installed base of civil and military full-flight simulators and training devices. •

Cobham looking ahead to coordinate with Indian companies

Indian market is exciting, large, challenging, price sensitive," said Lee Griffiths, Managing Director, Cobham India. The company has already responded to the Indian Government's request for information (RFI) integrated search and rescue system and is waiting for the request for proposal (RFP) to be issued.

"For us, besides looking for new partnerships, supporting our existing customers is also of utmost significance," said he explaining about the wide range of solutions of the company offered to the Indian armed forces. From avionics, air-air-refuelling, search and rescue and pilot safety programmes, the company has a lot to offer to the Indian armed forces. While the company is partnering with Hindustan Aeronuatics Limited (HAL) on the air-to-air refueling programme, the company is looking forward to setting up a maintenance repair and overhaul (MRO) facility and joint ventures on many programmes with Indian companies. •

Northrop Grumman offers STARLite to India

For the first time, Northrop Grumman has come with its AN/ZPY-1 STARLite small light weight radar for supporting tactical operations in India. In service with the US Army Communications and Electronics Command, this light weight affordable precision surveillance is now being offered to India. "We are talking to the Ministry of Defence (MoD) on this programme," said Joe Parsley of Northrop Grumman Electronics System.

Along with its other programmes, at Aero India 2011, the company has also displayed this light weight radar. The radar would be of great help in internal security. STARLite improves battlefield situational awareness and optimizes force manoeuver and engagement for mission success. The radar system is ideal for equipping a variety of manned and unmanned aerial system platforms for mission critical tactical reconnaissance including all-weather wide area surveillance, stationary and moving target detection and maritime sea search. There is a cultural shift from old warfare to new and the company claims this radar fits in to today's requirements. "It can take combat quality pictures," said Northrop Grumman officials. •

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Walter. F. Doran
President, Raytheon Asia

Raytheon's platform agnostic approach

For customers globally, a key advantage Raytheon brings to the table is our platform agnostic approach. Many of the systems we build are engineered in a manner that allows these technologies to be easily integrated into a variety of platforms. Why does this matter? Because it gives our customers flexibility and choice—we'll integrate our systems with the platform our customer chooses; that's critically important as countries such as India look to modernise various defence programmes.

Also, and this is particularly relevant to India, but Raytheon's broad range of technologies are ideally suited for the equally complex challenges your country faces. From defence modernisation to civil security to maritime security and more, Raytheon's portfolio is well aligned with the priorities of India.

In addition, Raytheon is a global company. It's easy to say this, but the facts stand for themselves. As reported on a recent conference call with investors, in 2010, 23 per cent of Raytheon's sales were to international customers, and its international revenues increased by 10 per cent over the past year. And, Raytheon's sales to international customers are the highest (in terms of percentage of total company sales) among larger aerospace and defence contractors. This demonstrates that Raytheon has the ability to truly deliver solutions that meet the needs of customers outside the United States. And, for a country like India that has a vast array of defence and civil security programmes on the horizon, it is important to know your partner has the ability to work with customers outside the US. •

Perfect integrator of "arrow weapon system"

MLM division of the systems missiles and space group of IAI is the prime contractor and system integrator of the "arrow weapon system" (AWS), the only operational anti-tactical/theater ballistic missile defense system in the world, and the "SHAVIT" small satellite launch system that was used for positioning of the "OFEQ" satellites in orbit.

MLM leads the world with its advanced avionics training & simulation systems. These include the "EHUD"TM - rangeless real-time air combat pilot training, debriefing and safety systems (Autonomous ACMI), helicopter training and safety (HTS) systems, situation awareness systems (SAW), IT tools and command, control, communication and intelligence (C3I) systems.

As a developer and user of the above systems, MLM has designed, developed and deployed many high performance, cost-effective and sophisticated telemetry and communication equipment & systems.

MLM offers its partners and customers uncompromising performance, reliability, and quality, with total commitment to collaboration and achievement. MLM provides full service from the earliest stages of concept analysis, through development, production and installation, and culminating in integration and life-cycle support. •

'Our relationship with India is based on what is good for India'

BY **SUCHETA DAS MOHAPATRA**

"India is going to receive the latest technology. Our relationship with India is based on what is good for India," said Bruce Scott, President, IIT Defense. He added that initially it would be technology transfer which would be followed by technology collaboration and as the relationship grows, it would lead to technology evolution.

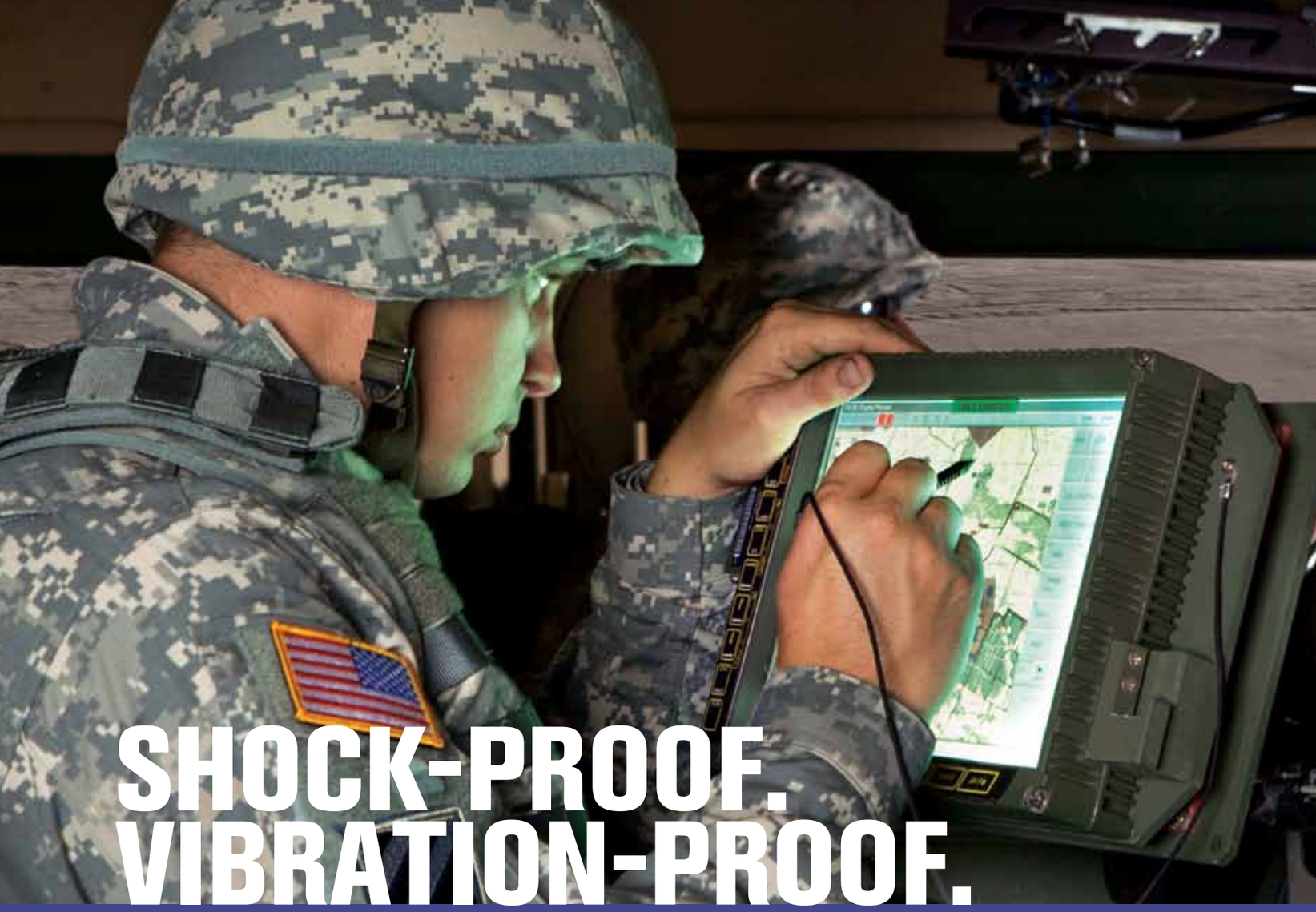
In an interaction with *SP's Show News* on the second day of Aero India 2011, Scott explained about the ITT solutions incorporated on different aircraft manufactured by US aerospace majors. The solutions include integrated warfare system in the F-18, weapons integrated in P8I, antennas in C-17, avionics in C-130J, etc. On the night vision technologies, Scott said that India will have the night vision technologies if and when required by the armed forces.

Scott seemed unhappy at the long time taken by the Indian for contract negotiations. "The offset clause needs to get better and the foreign direct investment should ideally be raised from 26 per cent to 49 per cent, which would be just perfect," he said and added, "I am not complaining. We have come so far and I think things would become better." •

Sattva AASPL, Sattva E Tech display products at Aero India

Real estate Company Sattva Group has recently forayed into the aerospace sector with its acquisition of two companies— Accessories and Systems Private Limited (AASPL) and E Tech.

Sattva Aero Accessories and Systems Private Limited (AASPL) will be displaying its range of generators and actuators in Aero India 2011 including Generator Control Unit, Crypto Engine Interface Board, Vaisakha- MIL 1553 PCI Card; CPU Board; Data Acquisition; Temperature Monitoring; and IO Boards; Vehicle Parking Control System. •



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DRS TECHNOLOGIES

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Vice President and Managing Director Rockwell Collins

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- The Rockwell Collins HF-9000D lightweight airborne HF radio which is a highly versatile, all solid-state, digital, high frequency radio communication system intended for both fixed- and rotary-wing airborne applications. The advanced features include digital signal processing technology to provide new embedded features in an exceptionally lightweight, compact system.
- The Rockwell Collins 629F-23 series is the most current offering in the ARC-210 programmable digital communication system. A fully digital transceiver, the 629F-23 provides superior performance from 30 to 512 MHz and provides interoperability between ground and airborne military forces and land-based civil agencies. The 629F-23 is the first ARC-210 with software loads tailored to customer requirements, including the TALON waveform.

For fixed site applications, the 721S transceiver offers the latest in V/UHF capabilities with the flexibility of ethernet and Voice over IP (VoIP) ground-air-ground communications; the URG III family offers the best in HF communications.

For ground applications, the FlexNet family of software defined radios enables interoperability for joint coalition forces. FlexNet radios include the FlexNet-one compact high-capacity, single-channel radio and the FlexNet-Four versatile multi-channel radio. Both radios are capable of supporting the FlexNet—waveform for high data-rate ad hoc networked communications as well as other waveforms, such as the combat net radio waveform. •

Cockpit avionics for new Skylander aircraft

Cobham is a leading provider of integrated end-to-end avionics solutions for fixed wing and rotorcraft markets covering general aviation, special mission, military training, business and commuter and airline transport. Cobham has developed strong relationships with most of the aircraft manufacturers globally and was recently selected to supply the complete avionics suite for the Sky Aircraft Skylander SK105 twin turbo prop commuter aircraft, due for first delivery in 2012.

Cobham will integrate a full suite of avionics for the SK105's flight deck, including large-format synthetic vision flight displays, advanced flight management capability, integrated hazard alerting, communication and navigation radios, and a digital autopilot with 3-D autoflight capability and automatic stall/overspeed protection. The twin-turboprop Skylander will carry up to 19 passengers or 2.7 tonnes of cargo. It has been designed as a robust aircraft able to operate in extreme environments. It is an economical and versatile aircraft with potential for commuter, freight and special mission roles such as medical evacuation, airborne surveillance and search and rescue. "Cobham is delighted to join Sky Aircraft in bringing this new aircraft to market," said Eiji Kawaishi, Vice President of Cobham Aerospace Communications. "The SK-105 Skylander is designed to provide the highest dispatch reliability and mission flexibility along with the lowest total cost of ownership for both civil and military operators," said Sky Aircraft CEO Serge Bitboul. "The Cobham avionics suite supports these goals with industry-leading capabilities and value, and its future-proof open architecture promises decades of growth and supportability," he added.

Based on its long experience of serving Indian aerospace customers, such as HAL, Cobham not only understands the technology requirements of India's indigenous programmes but is also committed to bringing latest high value avionics solutions to the Indian market. Cobham is already looking to offer avionics for multiple Indian programmes.

Sylvain Tudo, Business Development Manager for Cobham Avionics will be pleased to provide you an overview of Cobham's avionics portfolio during Aero India 2011 at Bangalore. Please visit us at Hall F Stand 35. •

BEL likely to manufacture missile seekers

BY **R. CHANDRAKANTH**

Bharat Electronics Limited (BEL) will be firming up at least two to three joint ventures with international companies in the next couple of years and is also looking at manufacturing missile seekers, the Chairman and Managing Director, Ashwani Kumar Datt announced here.

Addressing the media, he said serious discussions are going on between Thales, France in the area of civilian sector and select defence radars. Similarly, it is having a dialogue with Rafael, Israel for missile seekers and guidance electronics.

The first prototype of the Software Defined Radio (SDR) will be ready by June 2011 and it will replace all the future communication needs. BEL is also looking at various opportunities in the tactical communication system and other technologies.

BEL is capitalizing on offset orders and has partnerships with Thales, Northrop Grumman Corporation, Rafael, Boeing USA, IAI- Elta, and Fincantiery, Italy. "We hope the export orders will increase with the offset obligations." BEL has registered about $40million in exports through offsets.

BEL has had impressive performance and is targeting Rs 10,000 crores by 2012-13, with nearly 80 per cent of its revenues coming from the defence sector. The order book as of February is about Rs 18,000 crores. The non-defence projects revenue accounted for about 15 per cent and it included electronic voting machines, radars for civil aviation etc.

On Akash systems, he said it would be completed soon and be installed in the first squadron by June 2011 and the second by December 2011.

BEL also is expecting a huge order of coastal surveillance radars, valued at around Rs. 500 crores. As for aesa radar, he said, preliminary work with LRDE is going on and later BEL will collaborate with an international company for manufacture of the same.

BEL is showcasing its inherent R&D capabilities by demonstrating some of its new products / technologies including Software Defined Radios, Next Generation Bulk Encryptor and High Data Tactical Radio. Airborne products on display include radar finger printing system (RFPS), an airborne equipment that carries out fine grain analysis; data link, which provides a common tactical picture across the fleet by enabling exchange of messages and tactical data in a speedy, reliable and secure manner; digital flight control computer (DFCC), a computer used onboard aircraft for flight control functions; and Identification friend or foe, an electronic system which can determine the intent of an aircraft. •

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Mike LoDebole
Director , International Development
ITT Geospatial Systems

***SP's Show News* (SP's): Could you give brief details of your Company's profile?**
Mike LoDebole (LoDebole): ITT is the leading full-service supplier of the most advanced night vision equipment available today. ITT manufactures more high-performance night vision devices than all of our competitors combined. Our engineers are continually improving the performance of the image intensifier tube—the heart of every night vision product. The result is rugged, reliable and combat-proven night vision goggles that help fixed- and rotary-wing aviators and ground forces own the night.

SP's: What are the night vision devices your company has on offer in the field of military aviation?
LoDebole: ITT offers the AN/AVS-9 (ITT F4949 series) night vision goggle for aviation. The goggle, which was first developed in 1992, is the standard night flying system for air crews of the US Air Force and Navy. Over 26,000 F4949 systems are in service in 34 different countries and can be used for fixed- and rotary-wing aircraft.

SP's: Could you throw some light on panoramic night vision goggles (PNVGs)? How do these differ from the enhanced night vision goggles (ENVGs)?
LoDebole: The panoramic night vision goggle is an aviator goggle that uses four 16 mm image intensifier tubes and doubles the operator's field of view. ITT does not manufacture panoramic night vision goggles but only the 16 mm image intensifier tube. The 16 mm image intensifier tube is also used in the enhanced night vision goggle (ENVG). The ENVG is a ground system that optically overlays thermal infrared imaging and image intensification into one goggle and is currently being fielded by the US Army.

SP's: Apart from the US, which are the other countries using your products in their aircraft?
LoDebole: Our aviator goggles are used in over 30 countries around the world and are the goggles of choice for all the US military aviators.

SP's: Can your night vision devices be made compatible to different helmet configurations? Could these also adapt to different types of cockpit lighting? Please elaborate.
LoDebole: ITT's F4949 series of aviator's night vision systems is available in over 40 different configurations. The type of aircraft and type of helmet being used will determine which configuration—existing or customised—will best meet our customer's requirements. Our aviator goggles are adaptable to a wide variety of different cockpit lighting conditions from black and white, to colour to head-up displays.

SP's: Could you explain as to what is figure of merit (FOM) in the context of night vision capabilities? Are there any US governmental restrictions on FOM vis-à-vis export to other countries?
LoDebole: The figure of merit is used to specify maximum tube performance for export purposes. The US Department of State determines the FoM that can be exportable, which is determined on a case-by-case basis. Recently, the US State Department increased the FOM for India from 1,250 to 1,400, which should come as good news to India night vision users.

SP's: Has there been any tie-up/joint-venture concluded with any important Indian partner on this front? If so, please elaborate. Also how is it going vis-a-vis the Indian Government's policies that are constantly evolving in the context of defence procurements?
LoDebole: ITT has not concluded joint venture relationships with any Indian partner. That said, ITT continuously evaluates markets like India to determine the optimum path to market. ITT has been in India for several years now. Our defence groups work very closely with ITT Defence International Inc, office personnel, who have knowledge about Indian Government procurement policies, so that we are prepared to meet current and future customer needs as the defence market in India evolves. •

Finmeccanica scouts for industrial partnerships with Indian companies

Finmeccanica, the Italian group with leadership in aerospace, defence, security, energy and transport, is looking at establishing new partnerships with government and private players to expand its base in India. As a part of the growth strategy for the Indian market, Finmeccanica wants to adapt the approach of anticipating new programs and then seeking early involvement through transfer of technology and capabilities by creating strong synergies with the partners.

Finmeccanica has been present in India for over 40 years operating in the Indian region where company has a success story to share. In the last four decades Finmeccanica has developed long term relationships with Indian partners and participated in many pioneering projects, including supplying radar and communications systems, military and civil helicopters, civil aircrafts and naval systems.

Speaking about the Indian defence market, Giorgio Zappa, COO, Finmeccanica, said, "Indian Ministry of defence's current agenda to expand the defence industrial base, encourage indigenous defence production and reduce defence imports is commendable as that will ensure India faster approaching towards indigenisation. India is a key country for us, we seek preferred partnership and we want to expand our presence by showing our technologies with the capabilities of local partners."

Finmeccanica currently has significant partnerships with key public companies such as Bharat Electronic Limited (BEL), Bharat Heavy Electrical Limited (BHEL), Hindustan Aeronautics Limited (HAL) and Bharat Dynamics Limited (BDL) as well as with private companies such as Tata Sons and HCL. It continues to strengthen existing partnerships by value additions and constant upgradation and establishing new partnerships thereby contributing to increasing self reliance of the defence industry •

First-of-its-kind, tail-less aircraft moves closer to carrier trials in 2013

Northrop Grumman Corporation built U.S. Navy X-47B Unmanned Combat Air System Demonstration (UCAS-D) aircraft successfully completed its historic first flight at Edwards Air Force Base (AFB), Calif.

Conducted by a U.S. Navy/Northrop Grumman test team, the flight took off at 2:09 p.m. PST and lasted 29 minutes. This event marks a critical step in the program, moving the team forward to meet the demonstration objectives of a tailless fighter-sized unmanned aircraft to safely take off from and land on the deck of a U.S. Navy aircraft carrier. •

Jeff Roberts
Group President
Civil Simulation Products
Training & Services, CAE

CAE simulation and training presence growing in India

SP's Show News: How does CAE view the future of the civil aviation market in India?
Jeff Roberts (Roberts): We see one of the most dynamic civil aviation markets in the world here. The general economy is performing well. Passenger traffic has grown more than 200 per cent in the past decade, and is expected to continue to grow at double-digit annual rates. The government is investing billions in airport improvements. And carriers are confirming and increasing aircraft orders.

For us, that reinforces the industry predictions of a shortage of qualified pilots in the region. CAE's objective is to help airlines meet the demand for highly qualified pilots by delivering innovative simulation products and training services from the cadet level to senior captains.

SP's: CAE has considerably increased its presence in India in recent years. You are involved in type rating training, ab initio flight schools and even helicopter training.
Roberts: Thank you for noticing all the activity. CAE has made significant investments in the country over the past several years.

To serve the demand for initial, command and upgrade qualifications, we established a CAE Training Centre in Bangalore in 2009—one of 25 we have globally. Recently, the Bangalore centre earned approval as a type rating training organisation (TRTO) by India's Directorate General of Civil Aviation (DCGA), the first independent training centre to earn DCGA approval as a fixed-wing TRTO. The TRTO approval covers pilot training programmes for Airbus A320 series and Boeing 737 aircraft. Among the airlines who have trained pilots at the CAE facility in Bangalore are GoAir, IndiGo, Kingfisher and Spicejet, as well as the Indian Air Force (IAF).

To develop a steady pipeline of entry-level pilot candidates, we established— together with the Airports Authority of India (AAI)—CAE Global Academy Gondia, also known as the National Flying Training Institute (NFTI). The Gondia campus was designed and built from the ground up to be the most modern ab initio flight school in the world. This month we honoured the first three classes of graduates with their commercial pilot licenses (CPL).

We also took over management of CAE Global Academy Rae Bareli on behalf of the Ministry of Civil Aviation. This flight school, Indira Gandhi Rashtriya Uran Akademi (IGRUA), will reach its silver jubilee this year. Quite a milestone. As one of 11 CAE Global Academy locations around the world, the Rae Bareli flight school benefits from the CAE network's efficiencies of scale as well as standardisation of cadet selection, training curriculum and testing methodologies.

Combining CAE's ab initio and type-rating capabilities, we provide IndiGo and other airlines with ready-to-fly first officers and captains through our pilot provisioning service. This service helps streamline an airline's recruiting, selection and training process.

SP's: What about the new helicopter training facility in Bangalore?
Roberts: For civil and military helicopter operators, CAE has partnered with Hindustan Aeronautics Limited (HAL) in a joint venture called the Helicopter Academy to Train by Simulation of Flying (HATSOFF). The first HATSOFF full-flight simulator, a Bell 412, was qualified for Level D training in July 2010 by India's DGCA and the European Aviation Safety Agency (EASA). The second cockpit—for the civil/conventional variant of HAL's Dhruv—is now being installed in Bangalore. Over the coming months, we will add the military variant of the Dhruv and a Eurocopter Dauphin.

SP's: Air India has also been a long-time customer for CAE full-flight simulators.
Roberts: Yes, Air India has been a valued customer since 1970. They use our FFS's, flight training devices, and computer-based training for Airbus A300/310, A320 and Boeing 747 aircraft training.

SP's: CAE's presence in India is more than just training centres and simulators. You are also doing simulation design and development works in the Bangalore area.
Roberts: We have a sizeable engineering team in India. They play a key role in producing airport visual databases for the CAE true airport service. This is the only commercial simulation visual service that enables visual databases to be guaranteed up to date with regulatory requirements. And the updates are available by download over the Internet.

The CAE team in India also developed an FAA-approved CAE Simfinity e-Learning pilot ground school programme for AS350 Eurocopter helicopter training, enabling pilots to reduce their time at the training centre for both initial and recurrent training.

Altogether, CAE has about 300 employees in India and we hope to continue to grow in the years ahead. And we are pleased that our employees in India will be located in a new state-of-the-art aerospace and defence complex we just inaugurated in Bangalore.

CAE's comprehensive portfolio of simulation products and services enables us to have a unique conversation with any aircraft operator. We can provide a set of solutions to address their operational needs, whatever their business model. And we can adapt those solutions to continue to meet their training requirements as their operation evolves. •

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SAAB TECHNOLOGIES

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National security decision support through defence experimentation

BY **EUGENE BECKLES**

The demanding global environment that world leaders and governments must confront will remain challenging in the years ahead. Faced with a daunting range of potential threats, the simple application of military force is often not the most appropriate course of action and military victory is no guarantee of political stability. Political and military leaders who face tough decisions on how to allocate valuable resources that will shape the future of their nations are increasingly turning to defence experimentation, an established technique that exploits the increased scope and declining cost of simulation to enable exploration of options and generation of evidence to support tough defence decisions.

Using robust analysis and experimentation methods, the Boeing Company offers defence decision-makers the opportunity to explore options for future capabilities—not limited to equipment—in an advanced virtual environment. This proven collaborative approach is successfully supporting defence forces in the US, UK, Australia, Korea and Japan. And considering India's strategic importance in the Asia Pacific Region, it makes sense to extend the service to Bengaluru, right in the heart of the Indian Defence and Aerospace community, where Boeing has chosen to create the Analysis and Experimentation Centre (AEC). The location enables maximum interaction with those Indian companies that will be fundamental to the development of future military capability in India. Through the use of analysis and experimentation in the centre, requirements for new capabilities tailored to the Indian operational environment will be captured.

Industry Partnership

Boeing has partnered with Bharat Electronics Limited (BEL) at the AEC to draw on BEL's deep knowledge of the Indian defence environment, which is well matched to Boeing's system engineering and integration capabilities.

Together, we offer the Indian military community better insight into current and future capability requirements by exploring system and human-centric issues—particularly in the network-centric warfare environment—ultimately leading to better informed decision-making when selecting options for future operations.

Local Expertise

Boeing understands that issues of defence and national security can only be addressed in country by those who are most qualified to explore them. The Bengaluru AEC has been set up with that in mind staffed with retired Indian military personnel and modeling and simulation technical specialists.

Comprising versatile and reconfigurable laboratories with an adaptive environment, the centre draws on the experience gained in other nations where experimentation is an established element of defence planning and developing future system requirements. In addition to this experience, Boeing has transferred a number of mature experimentation tools that are not commercially available anywhere else in the world; giving the Bengaluru site a unique global identity in the experimentation industry. These tools will be made available for use by the Indian defence community—the military, Defence Research Development Organisation (DRDO) and defence public sector undertakings (DPSUs) and local industrial partners. This will also allow for the partnership to integrate locally-developed intellectual property with these established tools.

Benefits

The outcome of defence experiments will benefit the Indian armed forces:

- Providing the environment for exploring future capability requirements in operational scenarios.
- Producing evidence in support of force mix option decisions through conduct of analyses and experiments in operationally relevant scenarios.
- Providing a solid environment for exploring concepts of operation (how to fight) for new capabilities before they enter service and deployment of capability in particular scenarios (what to fight with)
- Exploring the challenges involved in integrating new capabilities with legacy systems.
- Allowing exploration of C4ISR, decision-support, and other network centric activities including those that cross organisational boundaries (example: joint operations).
- Enabling, understanding and refining long-term capability requirements by working more closely with the industry that will deliver those capabilities
- Ensuring that Indian requirements are captured and built into new capabilities to be fielded in India
- Reducing programme risk by considering system integration issues
- Providing a flexible and rapidly reconfigurable environment suitable for assessing urgent operational requirements

The centre will benefit our industry partners by:

- Providing an environment for exploring how collaborative projects between domestic and foreign companies will work in practice.
- Raising the awareness of the power and importance of defence experimentation as a key tool in military planning, procurement and capability delivery processes while building on Boeing's worldwide experimentation of best practices.

The Process

Working with the defence community to identify future capability challenges, the local Boeing team will conduct analyses and warfighting experiments following the internationally recognised best practices and processes developed over the past 15 years.

At the heart of this process is frequent interaction with the military customer to ensure that the right experimental questions are developed and the right tools and techniques are used to address the questions.

The process is laid down in the Guide for Understanding and Implementing Defence Experimentation (GuidEx) published under the Technical Cooperation Programme between the US, Canada, UK, Australia and New Zealand. It serves as the framework for communication between the military operational community which has the subject matter expertise and the analysts.

The process actively encourages participation in experiments by experienced service personnel. This ensures that the experimentation environment is fit for purpose and exposes warfighters to future capability options. The opinions of these experienced experimenters can then be shared with the operational community to improve current and future warfighting capabilities and concepts.

Boeing understands the growing influence of India as the world's largest democracy and the global role that the country is likely to play in the future. We see India as a trusted and strategically important regional player in both military and economic terms.

Setting up the AEC is clear evidence of Boeing's long-term commitment to the Indian armed forces. By gaining better understanding of India's military capability requirements we can become a better delivery partner over the coming decades as we bring Boeing's global best practices, tools and technologies to the AEC. •

—Director, International Experimentation Strategic Development & Experimentation, Boeing

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Chromalloy's new thermal barrier coating

Chromalloy has announced that its new thermal barrier coating enhances the performance of gas turbine engines."Chromalloy's new thermal barrier coating—the RT-35 Low K coating— provides lower thermal conductivity, which allows higher engine temperatures," said Dr. Peter Howard, Vice President, Technology and Quality Assurance.

The RT-35 Low K coating was patented by Chromalloy in 2006 and certified by the Federal Aviation Administration (FAA) in 2010 for use on the PW4000 second stage high pressure turbine blade after a series of tests confirming its low thermal conductivity, high thermal cycle durability and other attributes. The coating is currently in use by a commercial airline in Asia.

The RT-35 Low K coating provides a layer of insulation to the base metal component and underlying bond coating surface of a turbine blade from the extreme heat of the combustion gases during engine during operation.

"The coating provides 50 per cent lower thermal conductivity, allowing engines to perform at higher temperatures," Howard said. "Engines produce greater thrust when operating at higher temperature—and they can operate on the same amount of fuel as power plants that operate at lower temperatures. Chromalloy's RT-35 Low K coating is a critical driver for the engine to deliver greater fuel efficiency to the operator," he said.

In addition, the RT-35 Low K coating increases the oxidation and corrosion resistance of the underlying bond coating as it is cooler and thus extends the life of the engine components—another cost saving for the operator.

Chromalloy has been a pioneer in the development of innovative ceramic coatings for turbine engine "gas path" or hot section components for six decades, Chromalloy developed the industry's first electron beam physical vapor deposition (EBPVD) coatings with ceramic materials in the 1980s. Since that time the company has continued to develop innovative coatings for aerospace, aero-derivative, marine and industrial gas turbine components.

Chromalloy produces a variety of vacuum plasma and diffused precious metal/aluminide coatings for all hot section engine components. The company is a supplier to aircraft operators for new and repair components, as well as to the leading engine original equipment manufacturers (OEMs).

With 52 sales, repair and manufacturing locations in 17 countries, Chromalloy is the world's largest independent supplier of technologically advanced repairs, coatings, and FAA-approved replacement parts for turbine airfoils and other critical engine components for commercial airlines, the military and industrial turbine engine applications.

The company's engineered components and blades are subject to the same FAA requirements and scrutiny as OEM-produced equipment.

Chromalloy's replacement parts for aircraft engines are FAA certified to meet or exceed the performance, reliability and durability specifications of original equipment manufacturer parts. In support of marine and land-based gas turbines, the company employs identical engineering disciplines used to produce its FAA-certified parts.

The company's continued investment in research and development of coatings and repair and manufacturing technology has led to the development of electron beam physical vapour deposition with ceramic materials, vacuum plasma, diffused precious metal/aluminide coatings, and vision-guided interactive laser welding and drilling for most advanced turbine engine components, as well as many other advanced technologies. More information is at www.chromalloy.com. •

Saab ensuring superior knowledge in the field of composites

As a step to improve aerostructures composite knowledge and to bring the most efficient thinking into the market, Saab initially invested and has gradually increased the focus within its department for composites research and development (CRDD).

The department was set up a few years ago with the purpose to look into innovative design solutions, prototype methodologies, new tooling concepts and assembly ideas for the aerostructures composites workshop.

"It was a major step into the focus on composites and became a vital part of the ongoing high-rate production of the A320 Ailerons, the ramp-up of the 787 cargo doors work package, but also as integral part in the Gripen NG development and the Clean Sky development, where Saab develops an integrated wing panel in composites," says Magnus Falk, Head of Business Development, Marketing and Sales at Aerostructures.

Among others, the CRDD team have been involved in the tooling concepts for the UAV NEURON's composite panels. Conceptual design and manufacturing process enhancements for the highly integrated cargo door for the Boeing 787 Dreamliner. Conceptual design and manufacturing of composite parts for the EU-programme, ALCAS such as wing spar and the highly integrated sub sale wing box. Conceptual design and manufacturing of the redesigned A320 Aileron integrated composite box.

Composites tools have been in focus during the production of the NEURON fuselage. Saab is participating in the European project and will design and manufacture the central fuselage of the unmanned aerial vehicle (UAV).

"The use of composites tools for skin panels have been a success. Those tools have been seen as a very fast way from CATIA model to a real composites part and our composites team has shown only ten weeks in real lead time and another outcome have been a patent of the composite tool support structure," said Magnus Falk. •

Pratt & Whitney PurePower PW1200G engines on Mitsubishi Regional Jet

Pratt & Whitney will provide exclusive power for 50 firm and up to 50 options for new Mitsubishi Regional Jet aircraft ordered by Trans States Holdings as part of a contract. The agreement represents 100 firm PW1200G engines for the aircraft with eight spare engines and options for up to 100 additional engines with deliveries scheduled to start in 2014. In addition, Trans States Holdings has signed an exclusive 12-year maintenance contract with Pratt & Whitney for these engines. Pratt & Whitney is a division of United Technologies Corporation.

"We believe that the MRJ is a game-changing regional jet with its incredibly fuel efficient next generation Pratt & Whitney PurePower geared-turbofan engines, together addressing the vital needs of the environment, as well as the critical needs of passengers and airline operators," said Richard Leach, President, Trans States Holdings. "The MRJ will reduce fuel consumption, noise and NOx emissions-this means savings on operating costs," he added.

Each Mitsubishi Regional Jet aircraft is powered by two PurePower PW1200G engines with double digit reductions in fuel burn, environmental emissions, engine noise and operating costs when compared with today's engines.

"The state-of-the-art aerodynamic design, combined with a game-changing engine will reduce fuel consumption, noise and NOx emissions," said President Mitsubishi Aircraft Hideo Egawa. "This will contribute to improved competitiveness and profitability for the airlines, and also open the door to a greater number of airports at which the MRJ can be operated," he added.

"Pratt & Whitney is very proud to add Trans States Holdings to our growing list of distinguished PurePower engine family customers," said Todd Kallman, President, Pratt & Whitney Commercial Engines and Global Services. "We now have more than 600 PW1000G engines on order, when options are exercised," he added. •

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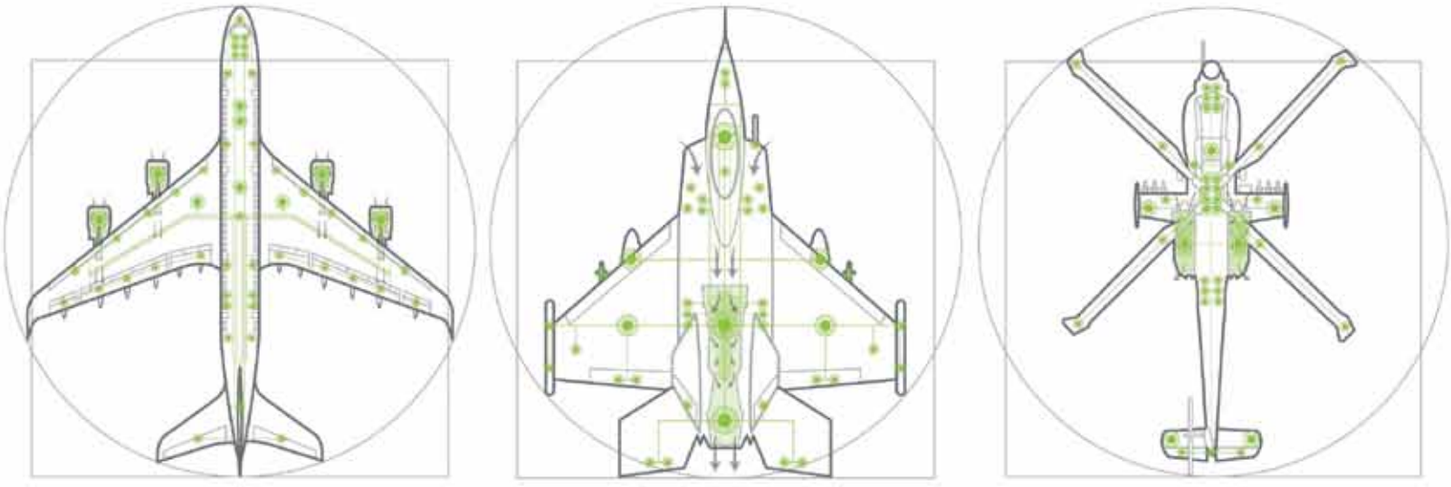

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Airbus to increase A330 production rate to 10 a month

Airbus has decided to raise the production rate for its A330 Family to ten aircraft a month from the second quarter of 2013. Currently Airbus turns out eight A330 Family aircraft each month. This monthly rate will increase to nine in early 2012, before reaching rate ten in the second quarter of 2013.

"We are increasing the production rate for the A330 Family due to the strong market demand for the aircraft," said Tom Williams, Airbus' Executive Vice President Programmes. "In the long-range, mid-size category, the A330 is the right aircraft for airlines worldwide". The A330 is not only a bestseller as a passenger airliner but also as a Multi Role Tanker Transport (MRTT) aircraft, as a VIP aircraft and also as a freighter. •

Gulfstream appoints independent sales representative in india

Gulfstream has appointed Arrow Aircraft Sales and Charters Private Limited, a professional business-aviation service provider, as an authorised independent sales representative for aircraft transactions in India. The company will work closely with Gulfstream's Jason Akovenko, Regional Vice President, Asia-Pacific, and Roger Sperry, regional Senior Vice President, International Sales, who will continue to oversee sales in the country.

"Asia-Pacific, the Middle East and Latin America represent more than 40 per cent of Gulfstream's backlog," Sperry said. "So we need to ensure we have the infrastructure in place to support this growing salesw trend. In a region as vast as Asia-Pacific, it's vital to have in-country sales support whenever a question might arise. Because they have offices in New Delhi, Kolkata and Mumbai, Arrow Aircraft Sales will be able to provide that face-to-face contact as well as a great deal of expertise gleaned from its founders' many years of aviation experience."

Arrow was established in 2009. The company provides a multitude of services to clients, including aircraft acquisitions, sales, charters and management. Its senior management consists of Samir Gupta, chairman and partner; Rohit Kapur, managing director and partner; and Shailendra Pratap Singh, executive director and partner. The trio offers a broad range of aviation experience. •

MiG-29K/KUB
on the Active List with the Indian Navy

A year ago an official ceremony of the first batch of MiG-29K/KUB ship-borne fighters' entering service with the Indian Navy took place on the Hansa air base in the state of Goa. Defense Minister Antony announced then "The induction of the MiG-29 fighters into the naval inventory fulfills its long-standing requirement. I am sure it will prove to be a milestone in building the navy's capabilities".

The first batch of six MiG-29K/KUBs was delivered to India in December of 2009. Aircrafts entered service with the INAS 303 Black Panthers. According to the contract signed in January of 2004 India will receive in total 16 such fighters including 12 MiG-29K single-seaters and 4 MiG-29KUB twin-seaters.

In March of 2010 during a visit of the Russian Prime Minister Vladimir Putin to India another contract was signed on the delivery of additional 29 MiG-29K/KUB fighters. Deliveries will start in 2012. As a result Indian Navy will have 45 MiG-29K/KUB fighters.

Fighters will enter aviation group of the new aircraft carrier of the Indian Navy "Vikramaditya" being currently completed in Russia. In the summer of 2010 prototype of MiG-29K was used for testing onboard equipment of "Vikramaditya". The aircraft carrier is expected to enter naval inventory by the end of 2012. In future new ship-borne MiGs will also serve on the new aircraft carriers built in India.

New ship-borne MiGs prove their cost efficiency. Career of the British Hornets is nearly over and MiG-29K will remain the only fighter capable to be operated on the STOBAR aircraft carriers. All serially-manufactured ship-borne aircrafts can be operated only on more complicated and expensive CATOBAR aircraft carriers. Director General of "Sukhoi" Company and RAC "MiG" Mikhail Pogosyan mentions that "MiG-29K is an advanced aviation complex which meets all current and future requirements".

Defense Ministry of Russia took a decision to acquire MiG-29K/KUB fighters for the Russian Navy. At least about 30 fighters are expected to enter aviation group of "Admiral Kuznetsov" aircraft carrier, and later new ships of the Russian Navy. It is worth mentioning that Indian MiG-29K/KUB stood successful tests on the "Admiral Kuznetsov" aircraft carrier in October of 2009.

MiG-35 fighter participating in the MMRCA tender and equipped with new-generation avionics became a further development of MiG-29K combat aircraft. •

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Ratan Tata flew the F/A-18 Super Hornet on February 10; (top right) SP Guide Publications Editor-in-Chief and Publisher Jayant Baranwal with Ratan Tata at the SP's stall; (below left) Minister of State for Defence M.M. Pallam Raju flies the Gripen simulator; (below right) German Defence Minister Karl-Theodor zu Guttenberg (second from left) visited the Eurofighter Typhoon pavillion; (bottom) aircraft on display at Aero India 2011.

PHOTOGRAPHS: Wg Cdr (Retd) R.S. Chauhan, S. Radhakrishna

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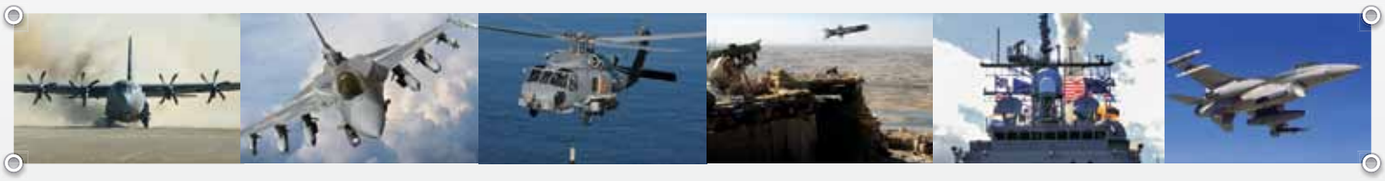

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