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[today]

02 Defence Minister launches
SP's MAI fortnightly



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

Violent Neighbourhood Will Push Up India's Defence Spending: Antony



PHOTOGRAPH: S. Radhakrishna

By **VISHAL THAPAR**

Violent disturbances in its neighbourhood will force India to increase its defence spending, Defence Minister A.K. Antony declared while inaugurating Aero India 2011, India's largest-ever airshow, which got off to a flying start at Yelahanka on Wednesday.

"India has always been a votary of peace. Yet, violent disturbances in our immediate and extended neighbourhood pose security challenges for our nation and the region as a whole. Our Government is steadfast in its resolve to meet any challenge. We are, therefore, committed to ensure rapid modernisation of our armed forces and equip them with state-of-the-art systems, equipment and platforms. Our current defence expenditure – 2.5 per cent of the GDP – is consistent with our projected security requirements, and is bound to increase over the next two decades," Antony said in his inaugural speech at the Eighth edition of the show.

India's defence budget for the current fiscal is over \$32 billion, of which \$13 billion is earmarked for capital outlays.

Aerospace requirements in particular will push the defence budget. Revealing the Government's official estimates of the size of the aviation market – both military and civil – till 2030, Secretary Defence Production R.K. Singh said India is likely to spend \$150 billion to meet its rapidly increasing requirements. Defence Minister A.K. Antony concurred, saying that India is the fastest growing aerospace market in the world.

Putting his weight behind self-reliance in the defence



[**Meet the Press**] P 4

MMRCA deal in a year

A.K. ANTONY
MINISTER OF DEFENCE

Defence Minister launches SP's MAI fortnightly



SP Guide Publication's newest offering SP's MAI (Military, Aerospace and Internal Security) was launched by Defence Minister A.K. Antony during Aero India 2011 on February 9, 2011. Seen in the picture with the Defence Minister are SP Guide Publications Editor-in-Chief and Publisher Jayant Baranwal, Minister of State for Defence M.M. Pallam Raju, Defence Secretary Pradeep Kumar, Director General (R&D), DRDO V.K. Saraswat and Chief of the Air Staff Air Chief Marshal P.V. Naik.

sector, Antony said the recently released Defence Production Policy was tailored to meet this priority and aimed at creating a strong industrial base. "We are encouraging our public and private sector industries to become active partners in this initiative. I'm sure that leading international aerospace companies will form long-term partnerships with the Indian industry," he said. "We are open to joint ventures, public-private partnerships and licence production under transfer of technology for the all-round development of the aerospace industry," the minister added.

The Defence Procurement Procedure is being fine-tuned to make it as transparent and efficient as possible. The scope of offsets has been expanded to include civil aerospace, internal security and training. "We hope that this will provide even better opportunities to foreign OEMs and at the same time help build indigenous capabilities," Antony said.

The Defence Minister expressed the hope that Aero India 2011 will further enhance India's emergence as an attractive market and a key outsourcing hub for global aerospace firms. "India possesses all the essential ingredients, namely, cost-effective manufacturing, skilled engineers, efficient organisations and the technology and software to do so. I'm sure that domestic and international firms in the aerospace and civil aviation sector will derive maximum benefit from the business potential displayed at the show," he said.

Antony, who has been India's Defence Minister since 2006, expressed happiness at the increasing business interest in Aero India. "Compared to its 2009 edition, the international participation has gone up by 25 per cent, with over 40 foreign delegations participating at this year's Aero India," he observed.

Antony declared that the next edition of Aero India will be held from February 6 to 10, 2013.

Earlier, in his address, Karnataka Chief Minister B.S. Yeddyurappa announced plans for an Aerospace City at Devanahalli near Bengaluru. He outlined his vision to make Karnataka a global investment destination.

An impressive flying display marked the inauguration of the airshow. A combat demonstration was provided using the indigenous Advanced Light Helicopter (ALH) and the Lancer light armed helicopter. Troops slithered down the ALH, and battle loads, including military vehicles were dropped from the helicopter in a simulated battle zone. An aerobatics display by the IAF's Surya Kiran team and a scintillating flight demonstration by fighter aircraft followed.

Among those present at the inaugural ceremony were Minister of State for Defence M.M. Pallam Raju, Marshal of the Air Force Arjan Singh, Army Chief General V.K. Singh, Defence Secretary Pradeep Kumar, HAL Chairman Ashok Nayak, Chairman of the CII National Defence Council Baba Kalyani and CII Director-General Chandrajit Banerjee. •

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MMRCA deal in a year

BY VISHAL THAPAR

The mother of all competitions in the largest global tender for medium multi-role fighter aircraft (MMRCA) will culminate in the next financial year, Defence Minister AK Antony declared at a press conference at Aero India 2011 on Wednesday.

"I hope that in the next financial year, we'll be able to clinch this deal," Antony said, when asked about the status of the global competition for selecting 126 fighters for the Indian Air Force.

Strongly rejecting the view that India will take a "political decision" while picking the winner, he said the selection will be done strictly on merits and in accordance with the provisions of the Defence Procurement Procedure (DPP). "There's no question of a political decision or interference. It will only be on the basis of the well-laid out evaluation process," he promised. Trial evaluation by the Air Force, and the competitiveness of commercial bids would be central to the final decision. "I'm not astrologer," Antony quipped when asked about the favourite.

The Defence Minister clarified that the changes in the Offsets policy - extending the scope to internal security, training and civil aviation - will not be retrospective. "This (retrospective application) won't be fair to the competition."

Significantly, Antony rejected feelers by the US on an offer for the F-35 to India. "We're already in an agreement with Russia on the Fifth Generation Fighter Aircraft (FGFA). No other country offered us a fifth generation aircraft in the past. We've already taken a decision. There's no going back," Antony said, slamming the door shut on any competition to the FGFA. "We're confident that we will start inducting the FGFA in 2017," he added.

The Defence Minister expressed hope that the indigenous Tejas Mk-2 fighter aircraft, fitted with the GE-414 engine, will be ready for induction by 2015. The deadline for the Final Operational Clearance for the Tejas Mk-1 is 2012. "More improvements are needed in the Tejas (Mk-1). I'm sure we'll be able to do it soon. No state-of-the-art product can be developed instantly. It's a gradual process," he said, conceding there are shortfalls in the indigenous fighter.

Similarly, improvements are required in the Arjun Main Battle Tank (MBT). "It has already been accepted by the Army, which has ordered a second batch of 124 tanks. There will be improvements in the Arjun Mk-2."

"The defence public sector undertakings are in a process of modernisation. All the 40 Ordnance factories too will be modernised in a phased manner, as per priority. We will put the heat on them but also support them." •

UK Government pushing hard for Eurofighter Typhoon

Eurofighter Typhoon is "value for money" and the U.K. Government fully endorses the four-nation campaign of offering the combat aircraft to India with "full industrial participation", the Minister for Defence Equipment, Peter Luff has announced.

Addressing a press conference at the Aero India 2011 show, the Minister said "We are passionate about India and we are passionate about Typhoon." The four-partner nations in the Eurofighter programme, he said, would fully extend cooperation with regards to transfer of technology. "We understand the aspirations of India and our offer is genuine industrial cooperation."

The British aerospace supply chain is keen on partnering with India, irrespective of the outcome of the medium multi-role combat aircraft (MMRCA) campaign. The programme, he said, would not only benefit India but also the United Kingdom. "The UK is in the programme for the long haul and I am not contemplating failure," he responded to a question.

The Minister also mentioned that India had been showing interest in the global combat ship. "We are looking at exports of the Type 26 Global combat ship."

Next month, the UK Department of Science and Technology Labs and India's Defence R&D Organisation (DRDO) would sign a letter of arrangement wherein there would be substantial exchange of future platform programmes. •



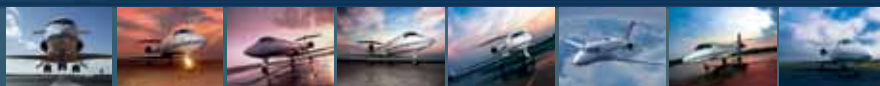
US Ambassador to India Timothy J Roemer in Lockheed Martin's super Viper

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A400M begins cold weather trials in Sweden

Airbus Military's second A400M development aircraft—Grizzly 2 visited Kiruna in northern Sweden for four days of cold weather trials at the beginning of February. The team experienced temperatures down to -21°C and successfully achieved all the planned test points during a programme that focused on the powerplants. The A400M was accompanied by an Airbus A340-300 carrying support equipment and the personnel team. These tests followed preliminary cold weather work in Hamburg last December and will be followed by further tests in more extreme temperatures at Kiruna and other locations this winter and next.



Pratt & Whitney F117 engine exceeds 8 million flight hours

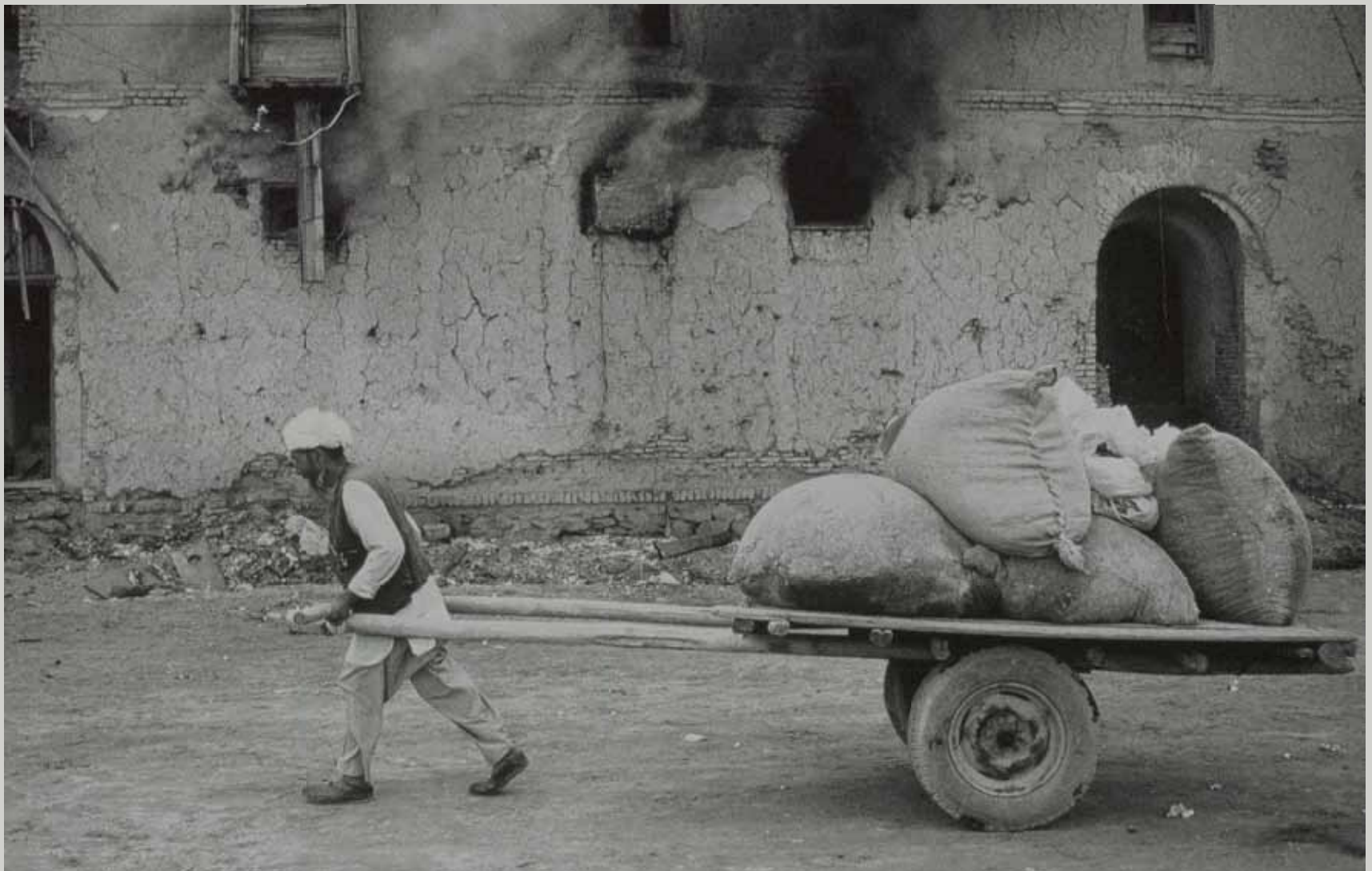
Pratt & Whitney's F117 engine, the exclusive power for the Boeing C-17 Globemaster III airlifter, recently exceeded eight million engine flight hours. At the same time, the C-17 exceeded two million flight hours, while supporting a US Air Force mission, and airdropped 74,000 pounds of supplies in support of US and allied troops.

"This landmark milestone is a testament to the efficiency of the F117 engine," said Bev Deachin, Vice President, Military Programmes and Customer Support, Pratt & Whitney. "The exceptional performance of our engine—in some of the harshest conditions—has helped the C-17 Globemaster III save countless lives in military, humanitarian and disaster relief missions around the world," he said.

Since 2006, Pratt & Whitney's F117 engines have accumulated more than four million flight hours in support of military and humanitarian missions around the globe. To put this in perspective, it took 13 years of operational service for the engine to reach the first four million flight-hour milestone. This statistic reflects the C-17's increased workload over the past several years.

The C-17 Globemaster III—the world's premier heavy airlifter—is operated by four F117 engines. The F117-PW-100 first entered service in 1993 and is a derivative of Pratt & Whitney's PW2037 commercial engine powering the Boeing 757. With more than 8 million hours of proven military service and 45 million hours in commercial use, the F117/PW2037 has consistently proven itself as a world-class dependable engine. Pratt & Whitney's ongoing investment in product improvements has enabled the engine to continuously surpass established goals for time on wing, in-flight shut downs and support turnaround time.

Pratt & Whitney has delivered more than 1,050 F117 engines worldwide, including 82 with international customers. The US Air Force—including active National Guard and Reserve units—has taken delivery of 207 C-17s. Other customers include the United Kingdom's Royal Air Force, the Qatar Emiri Air Force, the Canadian Air Force, the Royal Australian Air Force, the 12-member Strategic Airlift Capability initiative of NATO and Partnership for Peace nations, and the United Arab Emirates Air Force and Air Defence. •



For versatile use

The A400M is the ideal airlifter to fulfill the most varied requirements of any nation around the globe in terms of military, humanitarian and any other civic mission to the benefit of society

Unique in its kind, Airbus A400M is the most cost efficient and versatile airlifter of the 21st century. A400M is a larger, more modern, more flexible aircraft specifically designed to respond to the most varied needs that have emerged over the past decades in terms of military transport for the armed forces.

The A400M is the ideal airlifter to fulfill the most varied requirements of any nation around the globe in terms of military, humanitarian and any other civic mission to the benefit of society. It can perform missions which previously required two or more different types of aircraft, and which even then provided an imperfect solution.

It can fly higher, faster and further while retaining high manoeuvrability, low speed and short, soft and rough airfield capabilities. With its cargo hold specifically designed to carry today's outsize equipment, it can bring this material much faster and directly to where it is most needed, be it for military or humanitarian missions. Conceived to require very little maintenance, the A400M is extremely reliable and available. Being able to combine both tactical and strategic/logistic missions and also act as a tanker, it can perform the job of three different types of aircraft in one.

The A400M features technical innovations in all areas, from the airframe structure and materials to its aerodynamic design; it is a new turboprop engine, its fly-by-wire controls and related advanced flight-deck. It is technically the most advanced military transport ever built. With regard to the structure, in order to reduce weight, the A400M incorporates more light weight composite material than any other transport aircraft (civil or military) flying today.

A400M can carry more troops than any other Western-built troop carrier. It can accommodate up to 116 troops sitting face to face, alongside the fuselage and back-to-back along the centre line of the aircraft. And thanks



to its wider fuselage which provides more space between the rows, it can carry the same number of fully equipped paratroopers with their chutes and related equipment. Because of its high speed capability, the A400M can carry the paratroopers faster to where they are needed, and once over the location they can be dropped in less time over a limited area, allowing them to swiftly regroup and to be quickly operational.

The A400M is not only a perfect airlifter and troop transporter, it can also very easily be converted into an aerial refuelling tanker. The A400M is the only tanker which can refuel the entire range of military aircraft at their preferred speeds and altitudes. This is because it can fly both at the low speeds and altitudes (105 to 115 kt) typical to refuel helicopters, as well as at speeds of 280 to 300 kt and altitudes of around 25,000 ft which are typical for fast jets, such as fighters or large aircraft.

Further, the A400M can also be refuelled itself. It is equipped with a nose probe mounted above the cockpit, through which the A400M can be refuelled. This increases the range of the A400M. The probe can easily be removed when it is not needed. •



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HAL and GE Aviation sign contract for Hawk aircraft components

GE Aviation and India's premium public sector aerospace company Hindustan Aeronautics Limited (HAL) have signed 30-year contract that covers license to carry out repairs and overhaul of various avionics, instruments and hydraulic products for the Hawk Mk132 aircraft, an Advanced Jet Trainer operated by the Indian Air Force.

This license will provide in-house repair and overhaul capabilities to HAL for GE Aviation products and reduce turn-around-time for the repairs. HAL will build its maintenance, repair and overhaul capabilities at its Bangalore and Korwa facilities in India. The current schedule calls for the Bangalore facility to be certified for repair and overhaul of hydraulics and instruments and the Korwa facility to be certified for avionics.

As part of the license agreement, GE will develop, supply and commission the test equipment and supply technical data. The agreement also includes training, technical support, post design services for one year, and spares services.

"HAL has more than 70 years of providing high quality manufacturing, research and development, and repair and overhaul services in India," said Nalin Jain, Country Director for GE Aviation. "Adding overhaul for avionics, instruments and hydraulic products is the perfect expansion of HAL's capabilities." •

General Dynamics joins hands with HAL to support Hawk

General Dynamics UK has signed a contract with Hindustan Aeronautics Limited (HAL) to support the Indian Air Force's fleet of Hawk aircraft. The company's first contract with an Indian customer is for delivering an innovative approach to sharing its Intellectual Property (IP) with its partner, which will support the IAF's fleet of Hawk aircraft. According to the £4.9 million seven-year contract with HAL, an overhaul capability would be established to provide third and fourth line servicing for all the IAF and Indian Navy's Hawk MK 132 aircraft stores management systems (SMS).

The Hawk SMS would include two weapons control panels (WCP) and one weapons programming unit (WPU) manufactured and supplied by General Dynamics.

The company's key activities during the contract period would include provision of intellectual property, technical publications as well as training to the user community, programme set-up and facilities analysis, supply of line test set, provision of spare parts and reference units and in-service support for the duration of the contract. The licensing of General Dynamics UK's IP would include documents, training and technology to HAL for the service life of Hawk. •



French Ambassador pitches for co-development with India

"French industry is ready to co-develop in India and strengthen the strategic relationship between the two countries. We want the relation not only to continue but also to develop," said French Ambassador to India Jérôme Bonnafont speaking in support of the French defence industries gathered at Aero India show 2011. He said that India and France have the same values and therefore can work together on a set of similar objectives. "We can together fight threats like terrorism," he said.

Declining allegations that rich countries are selling outdated products to third world countries, Bonnafont said that there is no question of selling something old. Updating on the Indo-French joint programmes, he said that India and France are working on the Scorpene programme, the Kaveri engine programme, the short-range missile Maitri, etc. On the Mirage upgradation programme, he said that things are in the final stage. Similarly, he said that the Maitri missile programme between MBDA and Defence Research and Development Organisation would soon be finalised. "There are three stages in the Kaveri engine programme, co-development, production and legal aspects," he said. Asked about the business value of India for France, he said that a lot will depend on the MMRCA deal. •

Embraer makes headway with Phenom

"The market is here. Between 2011 and 2020 the market is about 9 billion dollar business jets in India," said Jose Eduardo Costas, Vice President, Marketing Sales, Asia-Pacific, Jose Eduardo Costas.

Addressing a press conference at the Aero India show 2011, Costas revealed that the Asia-Pacific market would be a major driver of business jets. India has seven Legacy, three Phenom and five other business jets in India and the numbers would go up as the company is going to step up its marketing efforts.

Phenom, he said, is flying in 29 countries and the latest to give acceptance has been Indonesia. The Phenom 100 and Phenom 300 executive jets have been certified by the Directorate General of Civil Aviation of Indonesia. •



Flying Bulls led by 62 year old lady

Hold your breath for the 17-minute aerobatics

The Flying Bulls aerobatic team from Czechoslovakia is totally energised (the Red Bull factor!!!). You would think the pilots are young and full of energy. Full of energy, yes, but they are not your average young pilots. The average age of the team is 50 years, but perform they did and with a lot of gusto.

The team consisting of civilian pilots Radka Machova, Jiri Saller, Jiri Veprek and Miroslav Krejci, got the adrenalin pumping, all in about 17 minutes. Travelling at speeds of 270 kmph and while diving touching 330 kmph, its sheer thrill to see them in that fleet of four Zlin 50 LXe aircraft.

Radka Machova (62) leads the team. Though this mother of two has been flying since 1971, she joined the Flying Bulls in August 2002. Asked how she maneuvered so well, she said. "Since I am in front, I don't have to follow anyone. I have to give instructions – turn left, turn right or dive." In all its years of flying aerobatics, the team has never had any accidents. Touch wood! "Well maybe a few scratches on the wings when the planes touch, but nothing major," says Machova.

The original team started out in 1960, but only Jiri Tlustý is on it even now. Renamed Flying Bulls after they tied up with Red Bull, the aviators have logged in over 35,000 hours.

The pilots started with the box formation (diamond), changed aircraft positions both vertically and horizontally and then touched-down in a joint formation. Their signature move – 'the mirror flight' is a treat to watch. The 'mirror flight' is a difficult one wherein the leading aircraft flies upside down immediately above a second aircraft flying right side up, mirroring the leading aircraft's flight figures. And then a third aircraft flies around the first two in close barrel rolls.

"Monkey" for good luck

The Flying Bulls have a 'Monkey', a soft toy, as their team mascot which travels everywhere with them. "We are quite superstitious about the 'monkey' and we take it along across the world. We even have a passport for our mascot." •



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Asia-Pacific region on Embraer's radar



Embraer has for long seen India as a very important partner, starting five years ago a deep relationship when the first five Legacy 600 VIP aircrafts were delivered to the Indian Government. As a whole, the Asia-Pacific region is becoming increasingly more important to Embraer's defence and security business. And being based in Brazil, Embraer understands the demands of fast-developing countries offering products that are the right match to the requirements.

The year of 2011 marks a very special moment for Embraer in the defence business, as for January 1st Embraer Defense and Security was established and will give undivided focus on the defence and security markets. This arrangement will allow it to expand and improve its capabilities to give faster responses to the needs of the customers and the fast growing defence and security market.

In recent years, Embraer has invested significantly in advanced technologies for the defence and security sector, not only with respect to aircraft and onboard systems, but also in integrated solutions for other applications, including segments of communication, command and control and training.

Currently Embraer's defence and security business is concentrated on seven areas: ISR (Intelligence, Surveillance and Reconnaissance), training and counterinsurgency, tactical transport, VIP aircrafts, aircraft modernisation, services and C4ISR systems.

The most recent member of the ISR family is DRDO's (Defence Research and Development Organisation) EMB 145 AEW&C. In 2008 Embraer was contracted to provide three ERJ 145 aircrafts as Airborne Early Warning and Control (AEW&C) platforms. Working strictly together to match the mission systems from India to the Brazilian-manufactured airframe, DRDO and Embraer have achieved a high level of collaboration. The result is a programme that is progressing firmly and on schedule, being set to its maiden flight still in this half of the year. For Embraer, the DRDO's EMB 145 AEW&C aircraft mark an important step in further strengthening its relation with the Indian Government.

The family of Embraer ISR aircraft is not restricted to the EMB 145 AEW&C. The Embraer ERJ 145 regional jet also set the base for the EMB 145 Multi Intel and the EMB 145 MP (Maritime Patrol). To date 15 ERJ 145-based ISR aircrafts have been delivered to Brazil, Mexico and Greece, proving every day for almost ten years its value both as force multipliers to the Armed Forces and as strategic assets in the fight against drug trafficking.

In the counterinsurgency and training segment, Embraer keeps a strong position with the Super Tucano aircraft. Inheriting the legacy of the highly successful Tucano trainer, operated by 16 countries, the Super Tucano was

designed to meet the challenges of the 21st century. Packed with advanced systems that assure high precision attacks, the Super Tucano is both sophisticated and robust, being able to be deployed from unpaved runways on extreme environmental conditions. It is no wonder why the Super Tucano was chosen by five Air Forces in South and Central America, operating over the Amazon Forest and in harsh conditions. And the Super Tucano will soon fly over Asia, in the colours of the Indonesia Air Force. A contract was signed last November to the delivery of eight aircrafts. At a total, 180 Super Tucano were sold in the Americas, Africa and Asia.

Embraer is entering into a new market with the KC-390, currently under development together with five partnering nations. This medium-sized military tactical transport aircraft is being designed to transport up to 23 tons of cargo – including wheeled armoured vehicles – and to perform in-flight refuelling. The Embraer KC-390 goal is to set a new standard in its class. A twin turbofan with outstanding operational productivity, the KC-390 will have the lowest total life cycle cost and the highest availability in its class. Designed to be refuelled in flight and also quickly configured as a tanker, the KC-390 will incorporate state-of-the-art avionics, with dual HUD, and a full-featured mission system, including accurate computed air release point (CARP). One of KC-390 goals is to have extraordinary field performance, being capable of operating from short and semi-prepared airstrips. A full fly-by-wire flight control system with optimized functions will assure best mission performance and safe flying with reduced crew workload.

For VIP transport, the Company's complete line of executive and commercial jets provides solutions to a wide range of needs. The Phenom family of light jets is well suited for short-range routes and operation on small airfields. As intermediate aircrafts, Embraer offers the versatile Legacy family (Legacy 450, Legacy 500, Legacy 600 and Legacy 650), complemented by the highly flexible ERJ 135 and ERJ 145 shuttle aircrafts. On the upper end, the Lineage 1000 ultra-large jet represents the maximum in terms of comfort. Finally, the Embraer 190 VIP is the ideal aircraft to transport larger delegations to distances up to 2900 nm. Besides VIP and Shuttle configurations, Embraer also offers MEDEVAC (Medical Evacuation) versions. Special communication systems, including V/UHF radios and IF, may also be installed, as well as self-protection systems.

In recent years, Embraer has also expanded its activities in the defence sector beyond aircrafts and airborne systems, offering integrated C4I (Communication, Computer, Command, Control and Intelligence) solutions. The C4I portfolio composes a real one-stop solution for governments' and customers' needs which can be applied to military operations and crisis management, as well as disaster relief. •

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KC-390

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The KC-390 has a full-featured mission system with computed air release point (CARP), integrated fly-by-wire controls, the latest avionics advancements, dual HUD, and complete self-protection capabilities that put it at the top of its class.

MISSION PERFORMANCE

The KC-390 is faster than medium-lift competitors and has extraordinary field performance, with the ability to carry up to 20 tons of payload and operate from short and semi-prepared strips.

Every decade or so, a new aircraft comes along that redefines the state of the art. The Embraer KC-390 is one of those aircraft. Configurable as a refueling tanker, troop transport, cargo carrier, or medevac platform, the KC-390 is designed for unmatched versatility and utility. Plus, its clean-sheet design allows the KC-390 to take full advantage of new generation technologies and deliver both the highest availability in its class and the lowest life-cycle cost. The KC-390: the newest addition to Embraer's portfolio of integrated defense solutions.

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Leland Wight
Boeing P-8I
Programme Manager

P-8I programme cruising ahead

Indian Navy looking forward to the delivery of Boeing's first aircraft in 2013

This past year has been very exciting and eventful for Boeing's P-8I programme. In 2010 our team began receiving the first indigenous deliveries, started testing software, completed the programme's final design review and in December began fabricating the fuselage for India's first P-8I aircraft.

All these are significant milestones, and the end result is that we have successfully transitioned from designing to building India's new long-range maritime reconnaissance and anti-submarine aircraft. At the end of our second contract year we remain on schedule and continue to perform according to plan, which is our ultimate goal. We are committed to providing the best and most affordable product for our customer – the Indian Navy.

This summer, in Boeing's Renton, Washington factory, you will see the first P-8I aircraft moving steadily through the final assembly. Employees will be utilising proven processes that leverage production efficiency. The P-8 team uses a first-in-industry in-line production process and Boeing's existing Next-Generation 737 production system to efficiently design P-8I aircraft, as well as P-8A planes for the US Navy. Both aircraft will share the same 737 assembly line. In 2011, we look forward to having P-8I and P-8A aircraft side-by-side in the factory.

During a recent US visit, Indian Navy chief Admiral Nirmal Verma travelled to Boeing and received an update on the P-8I programme and also witnessed our in-line process first-hand. He reiterated that the Indian Navy is looking forward to the delivery of Boeing's first aircraft, which will happen in 2013.

One near-term milestone, that both India and the Boeing's industry team are looking forward to, is the rollout and the first flight of the P-8I. That will happen around the end of the year and we expect to have a number of customer representatives on hand to participate in, and to witness the events.

Boeing and its industry team -- CFM International, Northrop Grumman, Raytheon, GE Aviation, Spirit AeroSystems and BAE Systems -- are working seamlessly to develop a weapons system that provides unrivalled performance.

The P-8I will provide the Indian Navy with speed, reliability, persistence and room for growth, to satisfy its maritime reconnaissance and anti-submarine warfare requirements now and in the future too. The P-8I features open system architecture, advanced sensor and display technologies and a worldwide base of suppliers, parts and support equipment.

P-8I a formidable deterrent

The P-8I will offer India tremendous capability advances over legacy systems. Designed specifically to counter threats from enemy submarines, the P-8I also will be a formidable deterrent to surface and over-land threats. Commonality between the P-8I and P-8A also will greatly enhance the interoperability and supportability objectives of both the U.S. and Indian navies.

The Indian navy's new aircraft will also share considerable commonality with the 737 Next-Generation fleet, thereby, contributing to significantly lower total operating costs. The addition of extra fuel tanks and strengthening of portions of the aircraft give it the range, endurance, and hardness to conduct military operations in an unsurpassed manner. The aircraft as configured has significant additional space and weight and power margins for growth systems as well. Additionally, the P-8I is part of the Boeing 737 Family of Systems, which includes derivative aircraft for a myriad of missions over land and sea.

Boeing's contract with India requires an offset commitment, which helps drive investments and transfers technology back to India. We are meeting that commitment, and continue to release contracts to Indian suppliers. To date, Boeing has placed eight contracts in India for key P-8I systems.

Moving from 'design' to 'build' is an important step forward for the P-8I programme and the team is proud of the progress it has made till date. Although there is much more to accomplish, we are ready for the challenge and believe 2011 will be another great year for the team and programme as the P-8I makes its debut. •

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Hall C - Stand C1
and Static C2



AN EADS COMPANY

Rega signs contract for GrandNew copter simulator



AgustaWestland, a Finmeccanica company, is pleased to announce that a contract has been signed with Rega, the Swiss SAR and EMS provider, for the supply of a state-of-the-art advanced simulator to meet the training requirements for Rega's new fleet of Da Vinci and GrandNew light twin helicopters. The simulator, designed and produced by AgustaWestland in Sesto Calende in Italy, will become operational in 2012 and is planned to be located adjacent to Zurich Airport in Switzerland.

John Ponsonby, Senior Vice President Training, AgustaWestland said after the signing, "This contract for an advanced simulator will help Rega not only maximize the operational capabilities of its helicopters but also contribute to its ongoing commitment to safety and excellence. We have had a long and successful partnership with Rega and we are delighted to see that partnership continuing and growing with this contract."

AgustaWestland will provide Rega with a Level 3 Flight Training Device / Level B Full Flight Simulator featuring a GrandNew light twin helicopter with IFR cockpit to offer VFR/IFR single and dual pilot flight and mission specific training. The simulator will help familiarise pilots with the latest technology found in the GrandNew cockpit, which features Flight-Logic Synthetic Vision EFIS (Electronic Flight Instrument System) with a FMS (Flight Management System), HTAWS (Helicopter Terrain Awareness Warning System), HTS (Highway In The Sky) and embedded flight recording functions. Under the contract AgustaWestland will also provide technical support and assistance in maintaining the device.

Acknowledged as one of the most experienced air-rescue organisations in the world, Rega has experienced a quantum leap forward in mission effectiveness and responsiveness following the introduction into service of the new Da Vinci helicopter, which succeeded its fleet of A109K2 aircraft. Rega has already taken delivery of ten out of eleven helicopters, with the last aircraft planned to be a GrandNew helicopter featuring Rega-dedicated mission kits, which will add to the ten Da Vinci single pilot cockpit-equipped aircraft. The Da Vinci, a highly customised variant of the GrandNew was specifically developed to meet Rega's requirements and will enable the operator to meet its mountain rescue requirements well into the 21st century.

AgustaWestland is a provider of professional training services and devices to a wide range of commercial, military and industrial customers around the world. Operators are assured of receiving highly effective training solutions, designed to meet their requirements, to achieve high levels of individual, team and collective performance and to enable customers to fully exploit AgustaWestland's high capability aircraft by using integrated learning environments. AgustaWestland is committed to offering the best training services as essential enablers in the delivery of mission capability to operators. •

Eurocopter plays its cards right in 2010 despite the global economic crisis

Eurocopter generated an increased turnover in 2010 with the delivery of 527 helicopters. The year also was marked by achievements in innovation, new products, services and the company's SHAPE transformation programme – all of which position the group for a future upturn of the civil and military rotary-wing marketplace.

The 2010 deliveries provided a turnover of 4.8 billion euros, representing a growth of six percent compared to 2009. They included 28 NH90 multi-role military helicopters and 15 Tiger attack helicopters – twice as many as in 2009 for both aircraft – as well as the first three of 50 EC725s for the Brazilian Armed Forces and the 100th UH-72A delivered to the U.S. Army on time and on budget.

While 2010 was another challenging year for our industry, we made solid advancements that enable us to be well-placed for an expected market recovery in 2012 and beyond," Eurocopter President & CEO Lutz Bertling said. "Our strengths for the future will come from Eurocopter's continually increasing investment in the product range and industrial capabilities, the expansion of our global footprint, along with major enhancements in our services offering."

Order bookings

Services and export sales were key drivers in Eurocopter's 2010 bookings. Orders for new helicopters represented 49 percent of the total, followed by the 42 percent share for services, and nine percent for development and other activities. The growing share of services bookings supports Eurocopter's Vision 2020, with the goal of further strengthening its services business. The new helicopter order shares were 51 per cent civil and 49 per cent military. Of the total 2010 bookings, 73 percent were for export sales, with the remaining 27 percent for Eurocopter's domestic European markets.

Bookings by product range

Eurocopter's 346 helicopter orders in 2010 were composed of the following: —143 AS350/AS355 Ecureuil/Fennec/EC130 family rotary-wing aircraft; 67 EC135s; 52 EC145s (including 40 UH-72A Lakotas); 45 Super Puma/Cougar EC225/EC725 family helicopters; 27 Dauphin/Panther/EC155 family helicopters; and 12 EC120 Colibri aircraft.

2011 Flight plan

Eurocopter's strategy for the next 12 months includes one program development launch for the expansion and modernization of its helicopter family, the first flight of a major product upgrade and one new helicopter certification.

The company's industrial capabilities will be broadened and strengthened with its new rotarywing center of excellence for EC725 helicopters in Brazil, the establishment of a joint venture to assemble EC145s in Kazakhstan, along with the consolidation and improvement of Eurocopter's facilities in Europe.

Eurocopter's focus on its services offer will range from the investment in full-flight simulators and the addition of new certified training/maintenance centers in the UK, Southeast Asia and Brazil to a planned further expansion of global capabilities through partnership and acquisition. An emphasis during 2011 will be on improving fleet safety with smaller operators, as well as in markets where Eurocopter is beginning to obtain a foothold. •

Merlinhawk has the vibes

Merlinhawk Aerospace core focus has been vibration monitoring, analysis and management of rotary and fixed wing propeller aircraft. Having been closely associated with the aviation industry in India for over 25 years, Merlinhawk has become a respectable player in the aviation market, not only in the Indian Sub-continent, but also in the overseas markets of Southeast Asia and Russia. Over the years, Merlinhawk has worked on many types of rotary winged aircraft such as Lama/Alouette, ALH, Mi-Series, Kamov Series, Sea King, Bell Series, etc and fixed wing aircraft such as Dornier, Dash, ATRs and AN-32.

With the vast knowledge and expertise gained the aviation industry, Merlinhawk has embarked on in-house research, design and development of software and hardware related to avionics, ground Support and testers which include:

- Vibration Warning Systems

- FDR related quick access recorders, replay and analysis systems
- Elektrone - Starting Power Packs CP – 28 V DC fixed Source
- ACLS - Aircraft Component Log Card System
- Integrated Testers for Ground testing of LRUs,

Engine and Aircraft systems

Compliant to FCC/CAA standards in quality and performance, in addition, the division also deals with power start-up devices for aircraft and other applications where the conservation of residual power on aircraft is critical.

These and other products including electronics subsystems for land vehicles in the development pipeline will provide the major thrust for Merlinhawk's growth in the domestic as well as the global market. •

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Selex in Eurofighter Tranche 3A programme

Sexel Communications, a Finmeccanica company, has signed contracts worth more than EUR 25 million for the Eurofighter Typhoon Tranche 3A programme; the orders are related to communications systems, with manufacturing activities to be carried out at its Italian facilities and deliveries starting from 2012. The total value of the company's involvement in the Eurofighter Typhoon Tranche 3A programme is around EUR 80 millions. The balance of the contracts to reach this total will be signed in the next months.

Selex Communications plays a key role in the Communication, Navigation and Identification (CNI) systems for the aircraft of the four partner nations (Germany, UK, Italy, Spain) as well as for the Austrian and the Saudi Arabian Typhoons. Selex Communications' equipments are: the IFF (Identification Friend or Foe) interrogator and transponder; the MMR (Multi-Mode Receiver); the DME-P (Distance Measuring Equipment - Precision) navigation system; the CSMU (Crash Survivable Memory Unit) for recording and recovering flight data and the MIU (MIDS Interface Unit). The company of Finmeccanica is also involved in supplying the Communication Audio Management Units (CAMU) and the V/UHF Transceiver. •

Selex Communications signs contract with NACMA

Sexel Communications has signed a frame contract with the North Atlantic Treaty Organisation (NATO) Air Command and Control System Management Agency (NACMA) worth approximately 30 million Euros (including options) for the supply and the installation of communication systems in a Link 16 network. The Link 16 network will enable the real time exchange of tactical data among ground and air platforms at an altitude of 29,000 feet in the European air space, thanks to Selex Communications' systems that will be installed in several land sites within 14 NATO countries.

These systems, that include also the multifunctional interface distribution system low volume terminals (MIDS LVT), are called Link 16 equipment suites, and they will be delivered starting from 2012.

The contract features three phases—the first one includes the development, integration and supply of the equipment, through the installation of the Link 16 systems in 13 sites located in Italy, Czech Republic, Portugal, Norway, Netherlands, Poland, Greece, Denmark, Spain, Hungary, Turkey and France. The two, optional, following phases, expect the completion of the supply with the installation of systems in Germany and England.

Giancarlo Grasso, CEO, Selex Communications declared, "This success strengthens the position of Selex Communications in the communication navigation and identification (CNI) market, confirming its leadership in the Link 16 sector." The contract signature ceremony was witnessed by Italy's Ambassador to NATO, Riccardo Sessa. Ambassador Sessa expressed his confidence in NATO, Selex Communications and Italy to build a strong and successful partnership in this effort.

"This operational capability will enhance the European air space situational awareness," said the NACMA General Manager, Dr Gerhard van der Giet, during the contract signature ceremony. "The project will help ensure valuable enhancements in NATO's Air and Missile Defense Systems. I am pleased we are beginning this important work," he added.

Selex Communications is a shareholder of EuroMIDS, one of the three MIDS LVT vendors worldwide. •

Saab sensors to beef up coastal surveillance

Defence and security company Saab has received an order from the Indian Maritime Authority, the Directorate General of Lighthouses and Lightships for supply of a system for coastal surveillance for the entire Indian coast.

The system that DGLL ordered comprises sensors to be installed along the Indian coast and equipment for regional and national control centers. Users of the system apart from DGLL will be the Indian navy, Coast Guard and DG Shipping. Saab will implement the project which includes installation, commissioning, training and support together with their Indian partner, Elcome Marine Services. The project will start immediately and will be completed within 18 months.

Honeywell reduces airport traffic disruptions



India is experiencing double digit growth in air transportation demand, and are in need of near-term solutions to rapidly expand their infrastructure and system capacity.

Honeywell developed the world's first and only FAA-certified Ground Based Augmentation System (GBAS) navigation aid, SmartPath™, for use in instrument (non-visual) meteorological conditions. Honeywell's technology will eliminate significant disruptions to airport traffic caused by ILS signal interference from weather, other aircraft, or terrain and obstacles.

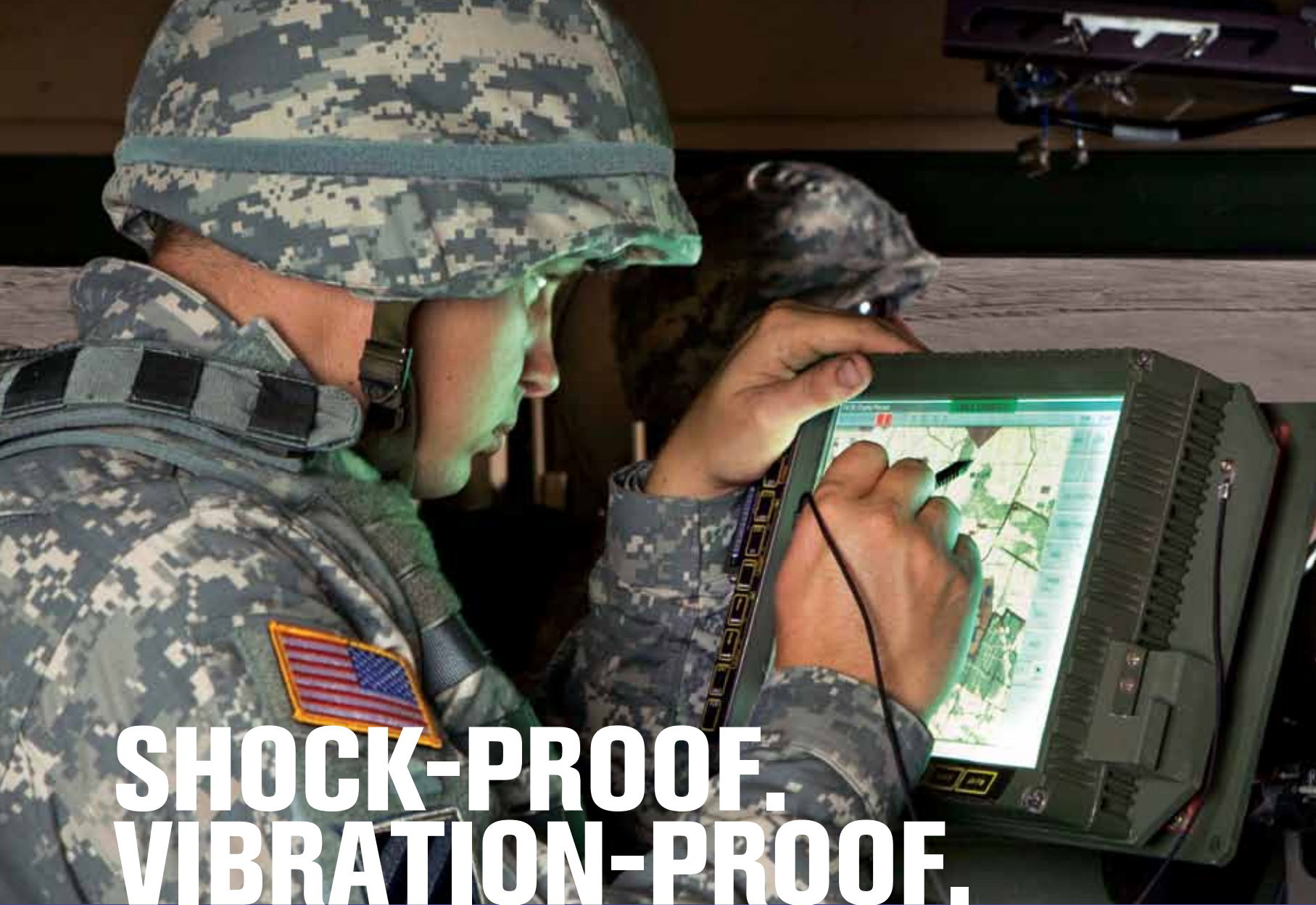
A single Honeywell system can support landing operations of multiple aircraft on multiple runways simultaneously, eliminating the need for multiple ILS systems at airports with more than one runway. One SmartPath system installed at a typical airport can yield annual maintenance savings of up to \$400,000 for an airport using ILS on two runways.

Replacing ILS with GBAS technology has been identified in FAA's Next-Gen Air Traffic Management plan and Europe's collaborative Single European Sky ATM Research (SESAR) joint undertaking.

Honeywell is a pioneer in this technology, having first demonstrated the ability to use GPS for aircraft landing in the early 1990s. Honeywell's GBAS technology in SmartPath has been demonstrated at more than 25 airports around the world and is operating at early adopter airports across the globe, including Bremen, Germany; Malaga, Spain; Memphis, Tenn.; Newark, N.J. and Sydney, Australia. •

"With this strategic order which contains future options, Saab will be able to develop further business in India within the marine domain. Our systems for monitoring sea traffic have been installed on several of the coasts in the world and also along inland waterways in Europe and in China. With this order we are strengthening our position further," said Gunilla Fransson, head of Saab's business area Security and Defense Solutions.

"It is equally satisfying that we now deepen and enhance our relation with India. This project along with the co-operations we already have makes India an important long term market for Saab," added Fransson. •



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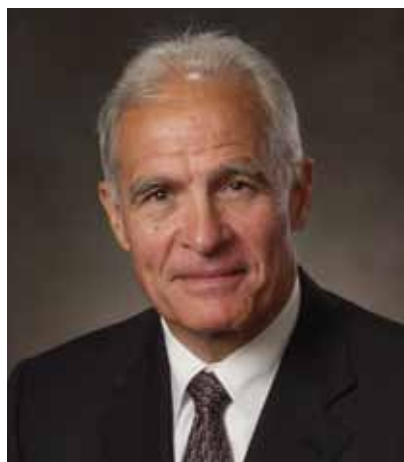
Over 115,000 DRS systems have been fielded for Blue Force Tracking and FBCB2. And thanks to a powerful Dual Core processor and flexible architecture, today's JV-5 is ready for future applications. From the Joint Battle Command-Platform (JBC-P) and beyond. Which means U.S. joint forces will see returns on this hardware investment for years to come.

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Nascent ATM market, ITT in control

John Kefaliotis
Vice President
Next Generation
Transportation Systems

Air traffic worldwide is expected to grow at 4.7 per cent and 4.9 per cent for 2011 and 2012, based on the global economic growth of over four per cent for the next three years. In the long term massive investments in aviation infrastructure are needed. Globally businesses will be increasingly driven by the need to have safe, secure and efficient systems. ITT Corporation has been in the forefront of providing technology products/solutions that provide a competitive edge. In the realm of air traffic management, which is part of ITT's Defence and Information Solutions business, the forays have been noteworthy and ITT is looking at a huge presence in India, a market which is impossible for any global company to ignore. In an interview with SP Guide Publications, the Vice President of Next Generation Transportation Systems, John Kefaliotis outlines the developments in air traffic management systems and the plans for India.

BY R. CHANDRAKANTH

SP's Show News: The focus is on India and most global companies are looking at India attracted by the huge market, is it so for ITT too?

John Kefaliotis (Kefaliotis): It is so. ITT has made substantial commitments in India. We have got manufacturing facilities there. We are very much interested in participating in the growing ATM market.

SP's: What kind of ATM market exists and how much of business are you expecting from India? And what challenges do you foresee in such a vast market?

Kefaliotis: It is a new market for us and we have to create and develop the market. I am speaking from my perspective on the India market. India's aviation market has high growth potential. It has outlined modernization plans in creating ATM infrastructure and our approach to developing that market is consistent with the approach we take in other market places. We make efforts to understand the customers; understand the policies and priorities of the country; the expansion and modernization plans; and we identify programmes that we can effectively participate in.

In our business there is a momentum for modernization globally of ATM infrastructure. The momentum is being driven by programmes for instance in the US by the Federal Aviation Administration (FAA) which is keen on developing and deploying its Next Generation Air Transportation System initiative and in Europe it is the SESAR (Single European Sky ATM Research) programme. We are developing and implementing new technologies that will make up and modernize the air traffic control systems...such as Automatic Dependent Surveillance-Broadcast (ADS-B) technology, and we hope to play a part in upcoming programs such as data communications. There is an operational concept and we have a range of technologies that support the operational concept.

Indian aviation officials are aware of these global programs and are supportive of them. India has announced major plans of modernizing air traffic control infrastructure. It is happening globally and it's happening in India. In the US, we are the prime contractor who is deploying the ADS-B programme and we hope to be able to be a participant in India as well when India moves into that technology.

SP's: In what time-frame is it likely to happen in India? What has been ITT's proposal to Indian authorities?

Kefaliotis: I cannot speak for the Airports Authority of India. Nevertheless, I see ATM infrastructure in place over the next five years. ITT opened an office in New Delhi last year - ITT Defence International - in addition to the ITT India subsidiary in Vadodara. We will approach the Indian aviation authorities through these entities and our offices have briefed the authorities about the various programmes.

SP's: What is the global ranking of ITT in the ATM discipline? What is the broad strategy to move up the ranking?

Kefaliotis: In the US, we are ranked third in sales. Globally, larger players are Thales and Selex....

However, we are making substantial headway. ITT has been a major provider of satellite based-GPS equipment. The benefits of GPS are pretty well understood worldwide. Air traffic management is now moving to satellite-based systems. The principal technologies that one would associate with Nextgen include Required Navigation Performance (RNP); ADS-B and data communications.

SP's: What is the progress on the implementation of the ADS-B system in the US?

Kefaliotis: In the US, it is already operational. We have deployed 300 radio stations which are delivering data broadcasts to aircraft. We have also established three major processing stations which distribute data and we have in place service equipment in 40 air traffic control facilities. The network is operational as per FAA requirements and the nationwide deployment will be complete by 2013. ITT's performance is outstanding, fully meeting all contract requirements on schedule and within budget.

SP's: What are the plans for implementation of ADS-B outside the US?

Kefaliotis: Australians have deployed ADS-B in the interior part of the country and globally there have been ADS-B deployments in the Hudson Bay, Canada and Newfoundland where radar based installations never existed. There are also numerous smaller installations in South East Asia and demonstration implementations in Europe.

SP's: ITT has announced its plans for strategic realignment in the defence segment. Would this exercise impact in any way allied sectors of the company such as ATM?

Kefaliotis: No. Most of the change that is planned to occur will be at the company's corporate headquarters level. ITT's Defence and Information Solutions business will remain intact and its ATM business is contained under that. We see no change in ATM business due to the restructuring.

SP's: Who are ITT's major rivals in the field of ATM and how does the company propose to remain globally competitive in this specialized area?

Kefaliotis: In the US, the competition is from Lockheed Martin, Raytheon and others, and in the world market it is Thales and others. We compete by being fully attendant to the requirements of the customers, and by designing our products and strategies to meet customer needs. We continuously work hard to deliver exactly what we promised in the contract.

SP's: What is unique to your company vis-a-viz ATM?

Kefaliotis: We are the only company to deploy and operate ADS-B on one of the largest ADS-B networks in the world. It is a system which has run through intense testing and safety certification by FAA. It has been verified by the FAA to be operational and its performance requirements are exceptional and safe and secure from an information security standpoint.

We go to the market with that technology, having developed integrated systems which can meet large scale needs. In India, we are hopeful of making breakthrough. Our business experience tells that we need to apply effort and our progress will be in a slow and steady manner. Our strategy is for the long haul....It's a huge opportunity here and ITT which is a high quality company is completely focused on delivering outstanding products and services. We look forward to participating in the Indian market. •

Saab setting up R&D centre in India

Also moving some manufacturing here

BY NIRMALA RAO

Almost answering to India's technology transfer needs, Swedish company, Saab has promised committed and latest transfer of technology, while ensuring that all offers would be transparent.

The commitments were made known by the Vice Minister of Defence, Hawken Javerell and the President and CEO, Hakan Buskhe in Bengaluru on the eve of Aero India 2011. The Minister endorsed the company's product offering and transfer of technology and also said that the Swedish government believed in "zero tolerance" with regard to corruption.

Buskhe said that Gripen IN, which is in the race for India's medium multi-role combat aircraft (MMRCA) is the only option that will fundamentally shift India's defence technology prowess to one that is able to realise its ambition of being an independent global player. The Saab approach is based on an extensive interaction between the partners aiming at long term industry expansion and GDP growth as well as technology spin off effects not ending with the end obligation and not restricted to the current applications of technology. Gripen is the option that can deliver the numbers that India requires, on time, on budget.

This would be achieved with an R&D centre and exchange programme with Sweden and this would be a long term programme. It would be independent and indigenous and the example was that of Carabas.

To bridge the gap between India and Sweden, the company would be setting up a research and development centre here for which the location is yet to be identified. The aim is to transfer already identified concrete programmes over time. The centre would

Saab moving facility from South Africa to India

With almost a \$ 1 billion market for weapon platforms in India in the next 10 years, Saab, the Swedish company, is offering major platforms which can be used both by the Army and the Air Force, the Country Head of Saab, Inderjit Sial has said. "We can integrate our weapon platforms on to any helicopter, even Russian."

Inderjit Sial said that as the Indian defence market is expanding exponentially, Saab is moving a manufacturing facility from South Africa to India, that indicates "our intent and commitment".

Saab will be firmly tying up with Indian companies in such programmes, he said and mentioned that HAL and Saab had in principle agreed on some programmes and that India could easily become an exporter of such systems. Saab had strengths in laser warning sensors, radars etc. "We have been selected by CEMILAC and we will offer the best of technologies." •

employ between 100 and 300 Indian engineers over five years and would include training courses and "on the job training" in Sweden learning about Saab and the Swedish way.

Weapon systems

Saab, he said, would provide missile systems, ground combat systems and camouflage products with a large potential and strong focus on the Indian market. The missile portfolio consists of the RB970 NG latest generation un-jammable VSHORAD systems Bamse (QR-SRSAM) and the RBS15 Mk3, besides some other systems.

The Saab, Mahindra BMS is a state-of-the art tactical command and control information system for land forces. Saab is offering true technology transfer to support indigenous production together with Mahindra.

Saab 340 and Saab 2000 offer to India

Buskhe said that the company is offering Medium Range Maritime Reconnaissance programme; Saab 340 Maritime Security Aircraft and Saab 340/2000 commercial aircraft. •

As a trusted partner and integrator of complex technologies, ITT has the expertise to create systems that work together seamlessly. From air traffic management and electronic warfare to night vision and tactical communications systems, ITT offers a wide array of sophisticated capabilities to answer every need. All this adds up to one result – your mission's success. For more information on ITT's full suite of solutions, visit us at ittdefenceindia.com.

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Raytheon enhancing technologies in tie-ups with Indian firms



Walter Doran
President, Raytheon Asia

Raytheon hopes to express our full and ongoing commitment to India. And, this commitment is nothing new—for more than 25 years, Raytheon has collaborated with the Indian government and been a valued partner and technology supplier across civil aviation, air traffic management, satellite navigation, and now defense.

Today, we are committed to enhancing our technology collaboration in India to share in the development and delivery of the latest technologies, systems and industrial base. In addition, the company is committed to helping strengthen India's economy and local industries, as well as its defense and technology capabilities.

Raytheon has proven expertise in delivering some of the latest technology capabilities to our international customers, including: the advanced sensors on the Super Hornet offering for the MMCA competition and which the Australian air force is already flying, highly capable weapons from our missiles business, as well as the latest advances in air traffic management solutions.

Raytheon is currently doing business with more than 80 countries, and we have built strong customer relationships and industry partnerships around the world. Raytheon's ability to listen to and anticipate our customers' needs, and develop the best systems to meet those needs, has made us a long-term valued partner for our allies.

"Raytheon's primary focus is on understanding the customer and meeting their needs. We believe that our established role in the Indian market, coupled with our leading capabilities across critical mission areas, position us as the partner of choice for customers in India for today and the future," said William Blair, president of Raytheon India.

Also, as mentioned earlier, Raytheon has already built strong alliances with local Indian businesses and organizations in the region – and we have proven successful doing so in other parts of the world (e.g. Japan, Australia,



Germany, and others). We have established positive ties with TATA Power SED, Grintex, Larson & Turbo, and Precision Electronics, just to name a few. Our goal is to continue developing strong, in-country partnerships that will support both our business as well as the Indian community.

Raytheon has been doing business in India for more than 25 years. We continued to be viewed by the Indian government as a trusted, valued industry partner and technology supplier in many areas. Doing business with the Indian community is very important to us and we take it seriously. Our attendance in Aero India is just one way Raytheon shows its commitment to the market and our customers. •

IMI features Delilah ground launched missiles

IMI has on display the Delilah ground launched (GL), loitering guided missile, the MPR500, multi-purpose rigid bomb, the IFB500, improved fragmentation bomb and IMI's new spectral IR flares. IMI also presents the red sky 2, very short range air defence system, offered as an upgrade to existing man portable air defence systems, as well as, the multi-purpose rifle system (MPRS) designed to provide infantry troops increased lethality and enhanced target incapacitation capabilities.

The Delilah GL is an advanced precision deep strike loitering missile, based on the combat proven air-launched, long range Delilah missile utilized by the Israeli Air Force (IAF). Adaptable for both fixed and moving launchers such as IMI's LYNX, autonomous multi-purpose rocket system, the missile is optimal against time critical moving and re-locatable targets on land or sea, in day/night or adverse weather conditions, with minimal collateral damage.

The missile is powered by a rocket booster for the launch phase and a turbojet engine for the cruise phase, allowing long-range flight and loitering capability. In addition, the missile incorporates an advanced combined GPS satellite positioning and Internal Navigation System (INS), as well as, Real Time Imagery for man-in-the loop intervention and target validation, ensuring a nearly autonomous mode of operation.

The MPR500 is a Multi-Purpose Rigid Bomb, capable of penetrating straight through four multi-level floors and double reinforced walls, while reducing collateral damage, making it optimal against challenging targets, such as bunkers and fortifications. The Bomb's enhanced effects eliminate the need for heavier bombs such as the 1000 and 2000 lbs. GP bombs, thus increasing aircraft carriage efficiency and ultimately the number of targets engaged per sortie. The MPR500 is certified to all guidance systems and is identical in size and form to the MK-82 Bomb.

The IFB500 is a highly effective anti-personnel and anti-material Improved Fragmentation Bomb. The bomb's enhanced fragmentation effect is achieved through a uniquely designed fragmentation envelope comprised of over 12,000 steel balls and a proximity electronic fuze, designed

to afflict severe damage to surface targets. The IFB500 is compatible to most eastern and western aircrafts.

IMI's extensive experience and expertise in developing state-of-the-art aerial countermeasures have led to the development of the new advanced spectral IR flares, which are the world's only covert pyrotechnic flares. The Spectral Flares are capable of defeating most advanced MANPADS, and are in use and combat proven by the Israeli Air Force. •

Alkan's ejection equipment fits any aircraft

Alkan, a French historical military aeronautical supplier since 1923, is specialized in carriage and ejection equipment for any type of aircraft. Alkan's equipment are in use in 51 countries and qualified aboard the most recent platforms.

In India, Alkan has established a partnership with the most important aeronautical players for combat aircraft (MIRAGE 2000) operated by IAF: supply of pylons, and associated ground support equipment. Alkan has been selected by HAL for the supply of release unit. Alkan is involved in an ongoing Transfer Of Technology.

For future programs, Alkan proposes the latest available weapon ejection technology: the cold gas system. The concept is based on the use of a rechargeable nitrogen cylinder to replace these pyrotechnic components. This concept provides a maintenance free system with better ejection performances. Nitrogen being a non aggressive inert gas, life cycle costs are reduced drastically.

This concept is now in operational use for many years, and combat proven on aircraft as Rafale and Gripen. •

Increasing synergy for Command and Control

BEL to showcase network centric warfare capabilities



Navratna defence public sector undertaking (DPSU) Bharat Electronic Limited (BEL) will showcase network-centric warfare technologies developed in-house at Aero India 2011.

Network centric warfare makes use of computer processing power and networking communications technology to provide shared information of the battlespace among defence forces. The shared awareness increases synergy for command and control, resulting in superior decision-making and the ability to coordinate complex military operations over long distances.

NCW solutions on show would include command and control system, a major display on air space management; multi sensor tracking, situation simulator and tactical algorithm for air defence applications; battlefield management system for supporting military users of all levels in a tactical battle area—from the individual soldier up to the Battalion Headquarter and Coastal Surveillance System, an all-weather 24x7 surveillance system for safeguarding the nation's coastline. The system networks sensors such as radars, day and night electro-optical equipment, automatic identification system and meteorological equipment to present an integrated operational picture of the offshore to the user.

BEL will also showcase its inherent research and development (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 will 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.

Also on display would be the complete range of opto electronic equipment, including night vision devices, digital hand held compass and advanced land navigation system.

The highlight of BEL's outdoor display will be the entire range of sub-systems that constitute Akash, the indigenous guided missile air defence weapon system for which BEL is the lead integrator. Another major system is weapon locating radar, the state-of-the-art passive, phased array radar, which has undergone successful user trials. Both these systems have been designed by Defence Research and Development Organisation. Mobile communication terminal, a multi-layer communication network, will also be on display. •



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Nexter is aboard ALH and LCH

Nexter, an European leader in defense systems, is showcasing its light-weight THL20 turret which is production for the Indian advanced light helicopter (ALH). Nexter has delivered 12 THL20 turrets to HAL so far.

Nexter is a major supplier of the air forces and army light aviations for high performances weaponry and protection systems. It provides also the French forces and many forces around the world with advanced combat systems, AFV, munitions and logistic services. Those assets are widely deployed in overseas theaters, Afghanistan being the most demanding.

THL20 is also promoted as main gunnery solution for the future Indian light combat helicopter. THL20 combines very lightweight, high precision and easy integration aboard light helicopters. Its open design eases system inte-

gration issues with any kind of combat systems. The destruction power of the 20 mm projectiles is far more devastating than a 12.7 machine gun.

Nexter has developed the SH20 door mounted system. SH20 uses the same gun as THL20. It is suitable for assault helicopter used by the Special Forces. It is in service with the French army special operation squadron.

In India, Nexter is also promoting its advanced artillery system Caesar which is successfully deployed in Afghanistan by French Army and has already been sold to three customers (183 systems effectively ordered).

A new armoured cabin has been designed. It is capable of withstanding ballistic level-2 and 3A/2B mine aggressions (as per Stanag 4569). With this cabin the Nexter artillery system is called Caesar Mk2. •

DRS Technologies to provide logistics support for US Navy's E-6 fleet

DRS Technologies, announced that its C3 and Aviation Group received a \$43.5 million contract to provide contractor logistics support (CLS) for the US Navy's E-6 take charge and move out (TACAMO) and airborne command post (ABNCP) aircraft fleet.

Awarded by the Naval Air Systems Command, this contract has a total value of over \$242 million if all options are exercised. Under the terms of the contract, DRS will maintain and support the E-6B TACAMO and ABNCP aircraft and Support Equipment under CLS. CLS for this program includes contractor management of government owned inventory to support the E-6B

aircraft (O, I and D Level) including common aircraft spares support.

"We are extremely pleased to be joining Team TACAMO to support this strategic US Navy platform and mission," said Al Dietrich, President of DRS' C3 & Aviation Company. "To address aviation maintenance, modifications and logistics support opportunities such as the E-6B Contractor Operated & Maintained Base Supply (COMBS) program, we have formed a highly talented team comprised of experts from across the aerospace and defense industry. We look forward to providing a high level of quality service this customer expects and deserves." •

Aerojet and Raytheon finish integration on warhead

Raytheon Company and Aerojet, a GenCorp company, completed a kinetic warhead system integration test for Standard Missile-3 Block IB. The test verified the ability of the warhead to detect, track and intercept a moving ballistic missile target in a zero-gravity environment.

During the test, a fully operational, flight-weight kinetic warhead operated on an air-bearing test stand and performed in a high-altitude chamber at Aerojet's Sacramento, Calif., facility. The kinetic warhead's seeker tracked a simulated target while the guidance computer sent information to the new Throttleable Divert and Attitude Control System. Once the TDACS received the information, the system fired its divert and attitude control thrusters and maintained aim on the target during the entire test sequence, simulating an actual flight mission.

"The test demonstrated the fire control loop of the kinetic warhead on the ground, which is a key indicator that we're on track for the first SM-3 Block IB intercept in space this year," said Frank Wyatt, vice president of Raytheon's Air

and Missile Defense Systems product line. "The Raytheon SM-3 team remains committed to mission assurance for this important program. Raytheon has the right people, the best supply base, the most robust production facilities and the expertise to deliver this critical capability to the fleet in 2012."

Raytheon's next-generation SM-3 Block IB maintains the reliability of the Block IA variant while incorporating an advanced two-color infrared seeker, an advanced signal processor and a new TDACS. SM-3 Block IB will be deployed in both sea-based and land-based modes as part of phase two of the current administration's Phased Adaptive Approach for missile defense.

Raytheon is developing SM-3 as part of the Missile Defense Agency's Aegis Ballistic Missile Defense System, and more than 130 SM-3s have been delivered to date. The missiles are deployed with both the U.S. and Japanese navies to defend against short- to intermediate-range ballistic missile threats in the ascent and midcourse phases of flight. •

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DRDO's "Nishant" silent killer in the making



Nishant, the unmanned aerial vehicle (UAV) has successfully completed the series of confirmatory trials conducted by the Indian Army at Chandan Range Pokharan recently. Nishant has been designed and developed by the Aeronautical Development Establishment (ADE), a DRDO (Defence Research & Development Organization) laboratory specializing in UAVs, Flight Control Systems and Simulators, in partnership with other DRDO laboratories namely Defence Electronics Applications Laboratory (DEAL), Dehradun, Research & Development Establishment (Engineers), Pune and Aerial Delivery Research & Development Establishment (ADRDE), Agra.

Dr Prahlada, Chief Controller Research & Development (Aeronautics and Services Interaction) said that Nishant can be launched from a hydro pneumatic launcher, without the need of a runway. The launch vehicle can be parked in a safe area and moved to any location for launching when ever required making it very versatile. The system consists of the air vehicle supported by "ground control station" equipment mounted on "Tatra" vehicles.

It has endurance up to 4.5 hrs. It has been designed to facilitate recovery at a desired place with the help of parachutes and landing bags. Nishant can be used in roles like battle field reconnaissance (day and night), surveillance, target tracking and localization and correction of artillery fire. The payloads that can be carried onboard Nishant for surveillance include electro optical, electronic intelligence and communication intelligence payloads. It can also be used for counter insurgency operations.

The successful flight trials were conducted by the Army before taking delivery of a set of four Nishant – UAVs together with ground systems. The trials were witnessed by Lt Gen Vinod Nayanar AVSM, Director General Artillery, Shri P S Krishnan, Distinguished Scientist and Director ADE, senior scientists from ADE and DEAL, Army trial team and the representatives from the Army regiment that is ultimately going to use the equipment. The performance of the pay load sensors in particular has been better than even the imported UAVs with the Army. It is expected that more of such equipment will soon be purchased by the users. •

IAI spearheads UAV systems

IAI's Malat division spearheads the design and manufacture of Unmanned Aerial Systems (UAS's). Malat offers a family of systems that varies in size, mission and sensors, mainly for defense-oriented customers.

Malat offers a family of systems that varies in size, endurance, mission profile and on-board sensors, covering the full spectrum of operational requirements by providing micro and mini systems as well as tactical close and short range and medium altitude long endurance (MALE) systems.

Over the last three decades, IAI's UAVs have been sold to more than 47 customers, including the Israel Air Force, the U.S. army, and armies in Asia and Europe. 6 armed forces are currently operating IAI's UAVs in Afghanistan: Spain, Australia, the United States, Canada, France, and Germany.

As part of the German SAATEG program, German Air Force pilots doing their training at IAI's facilities in Israel to receive special certification. Following the training, the pilots are sent to Afghanistan as certified Heron UAV system operators. IAI's UAVs have logged approximately 800,000 operational flight hours to date, over 15,000 of which were in Afghanistan. •

European UAV from Saab to France

Saab has now delivered the fuselage for Neuron, the European UAV demonstrator, to the primary contractor Dassault Aviation.

Neuron is a European collaboration project to develop a UCAV demonstrator, Unmanned Combat Aerial Vehicle. The aim is to develop expertise within advanced aeronautics. Six European countries are involved together with their aerospace industries: France, Sweden, Italy, Spain, Greece and Switzerland.

The work packages being managed by Saab relate to low signature (stealth) technology, flight testing, aerodynamics, avionics, the fuel system, the critical part of the ground station, as well as the design and production of the main fuselage, which has now been completed. The material and design used is mainly a composites sandwich construction.

The fuselage is being transported from Saab in Linköping to Istres, where Neuron's aft section is already located. This has been produced by HAI in Greece. At the end of February, structural parts will be arriving from RUAG in Switzerland, and the two wing halves being produced by EADS-CASA in Spain will arrive at the beginning of March. •

UAVs with Indian Army

The Indian Army is acquiring two more "troops" (6-8 birds each) of advanced Heron UAVs from Israel for Rs 1,118 crore after getting the nod from the Defence Acquisitions Council headed by Defence Minister A.K. Antony. The Army has also projected a requirement of seven "troops" of the Rustom medium-altitude, long-endurance (MALE) drones, being developed by Defence Research and Development Organisation and Aeronautical Development Establishment with Israeli help. Rustom will be capable of operating for 24 hours, with a 300 km range and a 10,000 metre maximum altitude. The Indian Army is also already inducting the indigenous Nishant and Lakshya UAVs. •

Skylark and Hermes 900 from Israel

The Skylark mini-UAV from Elbit Systems has notched up an enviable reputation for very close range, over-the-hill type operations, particularly in counterinsurgency and anti-terrorist roles. Currently, in service with a number of armies, this highly portable, man-packed device is designed for ready pre-mission assembly and hand launching, making it swift to deploy and is versatile in use. In addition to cutting-edge electronics and software drawn from the company's large UAV projects, composite materials have been used extensively in the construction, the net result being proven close surveillance at an affordable price.

Hermes 900 is at the other end of the scale and is Elbit's latest large UAV offering. This too has made a name for itself, having successfully completed its maiden flight by the end of 2009. This new, top-of-the-line intelligence tool is shortly expected to begin serial production, offering expanded mission capabilities to the military user. Building on the 170,000-flight-hour track record of the earlier Hermes 450, the new UAV extends its predecessor's performance to offer longer endurance, a higher operational ceiling, a larger payload capacity and all-weather functionality. Add to this, a silent engine, innovative electronics and avionics, cutting-edge electro-optic systems, laser designators and sensor technology, 36-hour endurance, a top speed of 120 kt and a payload capacity of 300 kg and the combined package seems set to raise the bar for the sector as a whole.

IAIs Heron is among the most widely used UAVs in the Asia-Pacific region. It is not surprising because Israel is the most experienced UAV-developing nation in the world. The Heron I medium altitude long endurance (MALE) aircraft was originally developed for strategic reconnaissance, high altitude land surveillance and maritime patrol missions. The Heron I feature multiple operational configurations, two proven simultaneous automatic take-off and landing systems and state-of-the-art avionics. It is capable of 45 hours continual flight, with a range of 350 km and a maximum altitude of 30,000 ft. It has a maximum payload of 250 kg and relays information through a direct line-of-sight (LOS) data link. •

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CAE's versatile solutions for enhanced safety, efficiency and mission readiness

**Martin Gagne, Group President,
Military Simulation Products,
Training & Services, CAE**

SP's ShowNews (SP's): At Aero India 2011, what will your company be showcasing – one to meet specific Indian requirements and two – to the region per se?

Martin Gagne (Gagne): CAE is showcasing technology to meet Indian and regional requirements. CAE's exhibit at Aero India 2011 will feature a range of simulation-based technology and capability demonstrations aimed at helping civil and military customers enhance safety, efficiency, and mission readiness. We will showcase an integrated unmanned aerial system (UAS) mission training solution capable of representing any UAS platform or sensor suite. The demonstration features a medium altitude long endurance (MALE) UAS performing a non-traditional intelligence, surveillance, and reconnaissance mission over a high-fidelity common database (CDB). In support of fast jet pilot training, CAE has developed a suite of simulation capabilities to enhance air-to-air combat maneuver training. At Aero India 2011, we will demonstrate this CAE STRIVE Air Combat Environment software solution. The Indian defence forces have a range of requirements in the coming years for training systems related to unmanned systems as well as fighters, and CAE's simulation technologies can fit these requirements. We will also highlight the CAE SimfinityTM Virtual Simulator (VSIM), which is a powerful familiarization and practice tool for pilot training. The VSIM offers the functionality of a full-flight simulator (FFS) on a laptop or desktop computer, providing the pilot the capability to perform almost all procedures as if they were in the cockpit of an FFS. Finally, we will demonstrate some CAE SimfinityTM e-Learning courses that provide accessible, operational training for pilots and maintenance technicians.

SP's: What is the market size for your product/service - first in India and then in the region?

Gagne: The market for simulation and modeling in India and the region is quite extensive. At a macro-level, simulation offers a number of advantages that address an ever-increasing global threat level and new economic constraints that are pressuring top-line defence spending. The cost savings from the use of modeling and simulation is considerable. The cost of fuel, detrimental environmental impacts, and significant wear and tear on weapon systems all point to the greater use of simulation and synthetic training. Equally important as a market driver, however, is that the current state of simulation is so highly realistic that it has become an integral tool for training and mission rehearsal. India's defence forces, and other defence forces in the region, are in a perfect position to extend their use of simulation to help ensure the training and readiness of their defence forces. The Indian Defence forces are recognizing the benefit modeling and simulation can provide to enhance their operational training while reducing costs, and they are now requiring high fidelity simulation for all their major platform acquisitions.

SP's: Are these technologies/products you are bringing to Aero India the latest? Can you give some details how your technology/service is unique?

Gagne: The simulation-based technologies we'll be showcasing at Aero India are a sampling of some of the latest civil and military simulation systems that CAE has developed. As you might imagine, though, there is no way for us to demonstrate all the varied technologies and capabilities of the company within the confines of an air show exhibit. CAE is the world leader in modeling and simulation and the only 'independent company' specifically focused on applying simulation to analysis, training, and operations in the entire world. To be able to survive in this competitive environment, we have no choice, but to be the best in business in simulation and training. We try to develop efficient and effective simulation systems through R&D and we strive to maintain our technology leadership. Our civil and military customers come to CAE because they know they will get the very best in modeling, simulation and training that helps them enhance safety, efficiency and readiness. In summary, it is really CAE's focus, experience and technology leadership in simulation and training that makes the company truly unique.



SP's: What are your plans in India – expansion; tie-ups etc?

Gagne: The Indian market is of strategic importance to CAE and this importance is demonstrated in the investments CAE has made in India. These investments include the formation of CAE India Pvt Ltd following the acquisition of Macmet Technologies in 2007; the formation of a joint venture with HAL called the Helicopter Academy to Train by Simulation of Flying (HAT-SOFF) that opened India's first advanced helicopter training centre last year; and a 150 person engineering centre of excellence in Bangalore. For the civil aviation market, CAE opened India's first independent pilot training centre in Bangalore, initially for A320 and B737NG training. CAE and the Airports Authority of India jointly own the Rajiv Gandhi National Flying Institute in Gondia, and CAE also manages the Indira Gandhi Rashtriya Uran Akademi (IGRUA), the Indian government's national flying institute. Our commitment to India and our view of the long-term prospects for the country are illustrated in our opening of a beautiful new aerospace and defence complex in Bangalore, which brings together most of CAE's more than 300 employees in India. With the Indian aviation industry as well as the Indian defence forces facing growth challenges, CAE believes simulation and training will continue to take on more importance so we will continue to make significant investments in India and expect to significantly expand our business.

SP's: What is your competitive edge?

Gagne: CAE is somewhat unique in that the focus of the entire company is modeling, simulation and training. We invest a significant amount on R&D specific to this niche, and there are opportunities to leverage technologies between the civil and military markets. For example, in 2009 we launched a C\$714 million R&D program called Project Falcon, which will expand CAE's current modeling and simulation technologies and increase its capabilities beyond training into other areas of the aerospace and defence market, such as analysis and operations. Importantly, we leverage our global footprint to bring our modeling and simulation technologies into regional markets, which we are doing for India through CAE India Pvt Ltd. A good example is the CAE-developed Common Database (CDB), which was originally developed for the United States Special Operations Command and we are now leveraging in the global market to significantly enhance mission rehearsal capabilities. This is the kind of technology and innovation CAE can bring to market so defence forces can better use simulation to enhance safety, efficiency, and mission readiness. For the civil aviation market, quite simply no other company can offer a more comprehensive portfolio of products and services that can be tailored to an airline's specific training requirements, from cadets all the way to captains. •



focus

It's true ... there is only one truly global company focused exclusively on modeling, simulation and training. Here in India and around the world, training and simulation is our business. In fact, we train more than 75,000 crewmembers annually at our military and civil aviation training centres, including the HATSOFF helicopter training centre in Bangalore. And our CAE Global Academy is now the world's largest network of ab initio flight schools, with the capacity of producing more than 1,800 cadet pilots annually.

From experts performing up-front training systems requirements analysis and training systems design, to our in-house manufacture and modification capability of the most advanced simulation equipment, to our unmatched ability to provide a full range of training support services, CAE has a unique Training Systems Integrator (TSI) capability.

As a platform-independent company focused on training, our expertise and experience come together to provide world-class training systems integration capabilities. We can help the Indian defence forces increase efficiency, save money and most importantly, stay one step ahead with enhanced mission preparedness.

Come visit CAE's booth (Hall C, Booth #C7) at Aero India 2011 to learn more about our comprehensive portfolio of simulation products and services.



CAE is a world-class training systems integrator, offering up-front training needs analysis, expert instructors, high-fidelity maintenance and aircrew training devices, and comprehensive training support services.



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Northrop Grumman's critical ISR systems

Northrop Grumman Corporation is highlighting its industry-leading range of capabilities in intelligence, surveillance and reconnaissance (ISR) including airborne early warning and control systems for maritime reconnaissance, fire control radars and unmanned aerial vehicles.

"ISR systems are critical to effective homeland security and our leadership in multiple-domain ISR strongly positions Northrop Grumman to help create solutions for India's coordinated national defence structure", said Bill Schaefer, Vice President, business development, Northrop Grumman Aerospace Systems sector. "Developing our relationship with India and our presence is an important dimension of the company's activities. We look forward to highlighting our range of products and capabilities and to supporting India's defence modernization objectives."

The exhibit will showcase Northrop Grumman's world leading capabilities in airborne early warning and control. Featured will be the E-2D Advanced Hawkeye and the Multi-role Electronically Scanned Array (MESA) radar.

The E-2D Advanced Hawkeye programme couples a newly designed electronically scanned radar with a matching suite of sensors, avionics, processors, software and display's to provide the most technologically advanced command and control capability available worldwide. The AN/APY-9 radar, with a two-generation leap in capability, is the backbone of this aircraft and provides greater flexibility and significantly improved detection and tracking over all terrains. The first E-2D to enter the U.S. Navy fleet was delivered in July 2010 and aircrew training is currently underway.

An E-2D Advanced Hawkeye crew work-station will be among the exhibits to demonstrate the benefits of the E-2D for military and civil applications. India is among the very first countries for which the Advanced Hawkeye capability has been released.

Northrop Grumman's airborne surveillance capability will also be highlighted with models of the Broad Area Maritime Surveillance Unmanned Aircraft System (BAMS UAS), the Long Endurance Multi-Intelligence Vehicle (LEMV) and Fire Scout, vertical unmanned aircraft system (VUAS) multi-

role UAV on display.

The MQ-4C BAMS UAS is based on a maritime derivative of the combat-proven RQ-4 Global Hawk unmanned aircraft with sensors and is a multi-mission maritime ISR system that will provide a continuous on-station presence while conducting open-ocean and littoral surveillance of targets. Construction of the first BAMS UAS aircraft began in September 2010.

The MQ-8B Fire Scout has been designed to accommodate a variety of sensor payloads and recently deployed for the first time aboard a ship with the U.S. Navy. An at-sea and land-based deployment is planned early this year. The Fire Scout has demonstrated capabilities to operate from the deck of underway ships, from remote fields, and in desert environments.

Continuing its industry leading capabilities in unmanned systems, Northrop Grumman is developing up to three LEMV long endurance hybrid airship systems for the US Army. This system is designed to be optionally manned, providing the flexibility to operate with or without a crew onboard, and sustain altitudes of 20,000 feet for a three-week period, to provide persistent ISR capability. Final testing of the first LEMV is planned for the end of 2011.

The MESA surveillance radar is an advanced airborne surveillance sensor and provides national protection, enabling sophisticated air-to-air and maritime coverage and integrated friend-or-foe identification. It is the first of its type with potential capabilities that have yet to be exploited. MESA provides beam-on-demand electronic scan flexibility, revisits in any direction at any time, extends range and special features and adjusts coverage to match threats. A scale model of the array will be available for viewing.

Northrop Grumman's role on the P-8I Indian Navy Maritime Patrol aircraft programme includes early warning self-protection (EWSP) and electronic support measures (ESM) systems. The EWSP detects and defeats RF and infrared-guided missile threats and the ESM provides passive radar signals collection and location capability. The Embedded GPS/Inertial Navigation System (EGI) provides navigation data for the aircraft. •

Customising products for the Indian and the Far East markets

SP's Show News (SP's): At Aero India 2011, what will your company be showcasing?

Northrop Grumman Italia (Italia): We will showcase some of our more sophisticated inertial navigation systems and attitude and heading reference systems, for example, the LISA 200 AHRS, the NAVEX (i.e. the all-European, ITAR-free solution of the LISA 200), some missile stabilisation systems such as the G2000, the STX—a new-generation system mounting the very latest, innovative technology, the micro electro mechanical system (MEMS) accelerometers—the ISA cluster for missiles (such as the IRIS-T missile) application, NAVEX-GL land navigation system, the newest magnetic sensor unit and another new-born—the TRIAX accelerometer.

The company will also exhibit an integrated avionics suite designed as a cockpit simulator and showing the application of a terrain and obstacle proximity system (TOPS), and a latest technology Jeppesen Map Computer.

These products are all designed and conceived to meet the requirements not only of a country that is living a new, expanded and top level "technologic renaissance" as India is but also for the Karnataka region, the whole Far East region, and of course other regions of the—mainly European—world.

SP's: What is the market size for your product/service—first in India and then in the region?

Italia: Our main market size is given by our cooperation and installation of our AHRS Systems on HAWK helicopters in India. We also hope to widen our horizons business-wise both in India and in the region.

SP's: Are these technologies/products you are bringing to Aero India, the latest? Can you give some details how your technology/service is unique?

Italia: Yes, they are. Dedicated to inertial navigation systems since its foundation 50 years ago, Northrop Grumman Italia has been lately developing new solutions for UAVs based on the latest sensor technologies such as fibre-optic gyros, micro electro-mechanical systems gyros and accelerometers.

But if innovation, research and development of new products are one of the main target of NG Italia, the company also offers a wide and consolidated range of products that go from low accuracy systems, used in the missile field, to the medium and high accuracy systems, generally developed for avionics programmes such as the Eurofighter Typhoon, Tornador, Alenia Aermacchi M346,

and several kinds of helicopters such as the Sikorsky UH-60, or tanks, for example, for the SICCONA programme.

In fact, we represent an excellence in a product area where we certainly do not have

rivals in Italy and very few abroad. Almost the totality of the supplied systems of navigation from Northrop Grumman Italia is the result of in-house development and production. And even when some systems developed by Northrop Grumman Corporate—i.e. our parent company—are supplied, these are customised by the Italian subsidiary in order to satisfy the specific requirements of anyone of our customers.

Our range of navigation products is more and more based on fibre optic sensors, a sophisticated technology that sees Northrop Grumman as a world leader. Moreover, we own a unique know-how as far as software development and integration of systems accessories are concerned; a quality that makes us extremely competitive when it comes to non-COTS solutions that require very high level operational performances.

SP's: What are your plans in India—expansion; tie-ups, etc?

Italia: Yes, in fact our mission in India is to expand our range of contacts in order to reach. An expansion of our business/market range; tie-ups with new customers/partners for new agreements; an activation of new projects (Research and Development); development of new products; identification of new customers; and a technology transfer or production licensing.

SP's: What is your competitive edge?

Italia: Customisation and tailoring of our products for the Indian and the Far East markets is our competitive edge. •



PERPETUAL **PROGRESS**



The governments, authorities and corporations Saab serves have a common goal – to prepare for tomorrow’s defence and civil security challenges. Saab works constantly, developing innovative technologies to meet those demands efficiently and effectively.

We place great value on research and development, allowing us to keep learning, adapting and evolving. But we understand that ability must be matched with commitment to trust; we always apply our expertise with intelligence and integrity.

Saab’s established international portfolio is built on over 70 years of experience in civil and military technologies. We develop products and services for land, air and sea defence, as well as for a range of civil security applications.

Our ambition and passion for innovation is endless – join us in perpetual progress. ●●●●●

PURPOSE	EVOLUTION
FUNCTION	SECURITY
ARENA	GLOBAL

Rafael's leading edge technologies

VADM (Retd) Yedidia Yaari
President and CEO
Rafael



Rafael attributes great significance to the Aero India Show, while envisioning the aerospace sector as a key area for achievement, capitalizing on its leading edge technologies and state-of-the-art products. A broad spectrum of Rafael's products have already attained world-class standing.

This year we will be displaying a wide range of advanced defense systems, such as the Spike Family, which consists of precise, tactical, electro-optic missiles suited for several platforms, multiple ranges and a variety of targets. Furthermore, we will exhibit the Spice 1000/2000 Autonomous Precision Guidance Kits, the Litening – Airborne Targeting and navigation Pod, and the Reccelite Family, Real Time Tactical Reconnaissance System.

For the first time at Aero India, Rafael will display the Imilite System - a multi-source, multi-task imagery intelligence system, which receives, exploits and processes multiple imagery sensors and data in a unified way, and disseminates relevant reports, products and materials over the network to authorized end users and clients.

In addition, Rafael will be displaying its multi-layered air defense solutions:

“David's Sling” – Air Defense System against mid-range missiles, in cooperation with the US company Raytheon, and “Iron Dome” – Air Defense System against short and mid-range missiles; along with the Python and Derby air-to-air missiles, and the Spyder Short and Medium Range Air Defense Systems.

The “Net Centric Warfare” solutions, with the introduction of the Global Link, integrated, airborne voice and data communication and applications suite solution for air forces NCO (Net work Centric Operation).

Rafael Advanced Defense Systems Ltd develops and produces state-of-the-art armaments for the Israeli Defense Forces (IDF) and Israel's defense system, while deriving its economic strength from international sales.

The company provides innovative solutions on the technological cutting edge from underwater, naval, land and air through space systems. Rafael focuses on such areas as Electronic Warfare (EW); Command, Control, Communications, Computers and Intelligence (C4I); Training and Simulators; Armor and Precision-Guided Weapon Systems. The company has also formed partnerships with civilian counterparts to develop commercial applications based on its proprietary technologies. Rafael is the second largest government-owned defense company in Israel, and in 2009 sales amounted to \$1.6 billion with a backlog of orders worth \$1.86 billion. At the end of 2009, the company made a profit of \$112 million.

Rafael's huge investment in R & D, together with the high quality of our work force, is fundamental to our success in offering the wide range of products and technologies that enable us to offer customers both dedicated solutions and custom-made solutions based on the specific requirements determined by varied types of combat scenarios.

Elbit Systems Next-Gen solutions

A broad spectrum of Elbit Systems innovative solutions designed for the changing requirements of the defense industry is on display at Aero India exhibition. Visitors to the Elbit Systems' booth (Israel Pavilion - Hall A) can view a wide range of cutting edge integrated solutions and technologies that have established Elbit Systems as an industry leader in every one of its fields of operation. A variety of product presentations and capabilities will highlight the company's comprehensive, leading edge defense and security technologies.

The company has live multimedia presentations and a number of high tech products on display.

Tadiran SDR-7200 AR:

Specifically designed for aircraft, the Tadiran SDR-7200 AR provides continuous networking throughout any mission, greatly enhancing situational awareness and contributing significantly to mission success. The SDR-7200 AR unique features and capabilities include extended reach using distinctive automatic routing and relay capabilities. In addition, it simultaneously transmits voice, video and data. Embedded in the radio are fundamental avionics applications, including maps and video that enable strategic on-the-move commands and real-time intelligence. The SDR's versatility is integral in supporting air-to-air, air-to-sea and air-to-ground communications, providing a significant tactical edge in battle. Part of Elbit Systems' SDR family of products, the Tadiran SDR-7200 AR is fully compliant with the Software Communications Architecture (SCA) Lite 2.2.2 and compatible with other communications systems. It is the latest in a series of software-defined radio systems from Elbit Systems – a world leader in field-proven military communications solutions.

Avionic Products and Systems

Elbit Systems, with its comprehensive airborne systems capabilities, can provide a single sensor or an entire cockpit avionic suite. The following will be displayed in the Company's booth:

Fixed Wing Airborne Systems

Elbit Systems has earned international recognition in the aircraft upgrade market and has maintained its leading position in the field. Using its expertise as an integrator and developer of cutting edge next generation defense electronics systems, Elbit Systems has expanded its line to encompass such features as data link systems, data fusion expert systems and 3-D digital maps. Based on its vast experience as the main supplier of avionic systems for Lockheed Martin and Israel Air Force F-16s, Elbit Systems is a world leader in addressing entire platforms and upgrading existing aircraft with enhanced performance, extended life and next-generation capabilities.

Glass Cockpit Solutions

Elbit Systems presents a glass cockpit featuring three digital 6"x8" independent smart, multi-functional displays (SMFD) enabling maximum situational awareness and flight safety with a high level of mission simulation and capability for visual tactical training.

Unmanned Systems:

Elbit Systems' Unmanned Aircraft Systems (UAS) have earned international recognition and play vital roles in the global war on terrorism. The Company's UAS are the backbone of the Israel Defense Forces and other world leading armed forces. •

Along its key marketing strategy, Rafael has created partnerships with companies in Israel and with leading aerospace and defense companies overseas. Offset activities and industrial cooperation have been organized with over 20 countries worldwide. Over the last decade, international business activities have been steadily expanding across the globe, with Rafael acting as either prime contractor or subcontractor, capitalizing on its strengths at both system and subsystem levels.

We would like to emphasize the uniqueness of the partnership between India and Israel, based on mutual trust and esteem leading to excellent professional ties, for the economic and defense benefit of our countries. Special effort is invested in strengthening the cooperation with the Indian industries, the Indian Forces and the DRDO, towards establishment of a joint venture in India. •

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Rockwell Collins aviation solutions for today and tomorrow

T.C. Chan
Vice President and Managing Director
Asia Pacific, Rockwell Collins

SP's Show News (SP's): What solutions does Rockwell Collins bring to the fixed and rotary wing aircraft in India?

T.C. (Chan): The needs for situational awareness, reduced crew workload and enhanced levels of flight safety for military forces are constantly changing and Rockwell Collins continues to stay at the forefront of those evolving needs with our Flight2 and CAAS (Common Avionics Architecture System) avionics systems. These systems can be customized for new or retrofit solutions to include controls and displays, information/data processing and communication, navigation and safety and surveillance systems.

Thousands of fixed and rotary wing aircraft have been delivered and are in operational service with Rockwell Collins products, systems and support. We have also been the prime contractor on many complex avionics system installations and upgrades in the United States and around the world.

Some avionics system highlights we offer include:

- A modular open systems architecture for interoperability with new and legacy systems and lower overall life cycle costs.
- Our architectures use components from the most modern avionics systems in use in the United States and other countries.
- Our systems are qualified and certified to military standards.
- We offer redundant systems to improve system reliability and safety.

In addition to our Flight 2 integrated avionics we also offer our commercial Pro Line 21 Integrated Display System (IDS) with advanced capabilities for our customers in India. Pro Line 21 IDS delivers digital display with timely and specific information for the planned flight by integrating industry leading display and graphics with existing sensors, radios, flight management systems and autopilots. The end result is increased situational awareness, state-of-the-art functionality and trusted reliability.

SP's: What systems do you offer for UAVs?

Chan: With a growing focus on developing indigenous UAVs in India, we see

tremendous opportunities for our flight control and navigation systems, communication data links, engine control systems and systems integration.

Recent news from India indicates greater exploration and implementation of UAVs in -country, including the following examples:

- The Indian Navy is adding reconnaissance UAVs including a squadron to monitor the coast of Gujarat;
- India is adding combat drones from Israel to fight terrorism;
- Due to the devastation caused by cyclones in India last year, the Indian Meteorological Department is planning to purchase UAVs that will be flown into cyclones to gather data to enable the government to take action and save lives.
- Indian scientists are working on anti-collision and better landing systems for UAVs.

At Rockwell Collins, we understand that UAVs are considered "systems" and not stand alone vehicles, and that these systems include controls, propulsion systems, payloads, communications, ground control systems, life cycle support maintenance teams, and more. We offer nose to tail systems for UAVs and are active on over 20 platforms around the world.

Our Athena flight control and navigation systems for UAVs are miniaturized, light-weight, highly reliable integrated control, INS, GPS and Air Data, Attitude, Heading and Reference systems. Available in low cost redundant configurations, these systems enable autonomous operations and are proven with over 750,000 flight hours in combat theaters. Used on both manned and unmanned aircraft, these systems are moving towards obtaining commercial classification.

In addition to control and navigation systems, we offer a wide range of communications, command, control and intelligence solutions, as well as payloads and engine controls for UAVs. By doing business with Rockwell Collins, customers can also gain insight and access to sense and avoid and damage tolerance technologies to enable UAVs to fly safely alongside manned aircraft in shared airspace. For more information, visit www.rockwellcollins.com •

Cobham's avionics for Indian helicopter programmes?

Over the years Cobham antennas, intercommunication systems, radios and radio navigation equipment have been selected by major original equipment manufacturers (OEM's) for its technical performance, robustness and reliability.

The latest confirmation of this is a multimillion pound long term agreement which Cobham has recently entered into with Korean Aerospace Industries (KAI), to supply a range of equipment for the Korean Utility Helicopter, the Surion. South Korea plans to produce 245 helicopters over the next 10 years to replace their ageing fleet of helicopters. KAI's selection of Cobham follows a successful multi-year trials programme and further enhances a long standing relationship which has already seen the Company's equipment selected for KAI's KT-1 turboprop trainer and T-50

supersonic advanced jet trainer/fighter.

Cobham has also supplied antennas, radios and radio navigation to Hindustan Aeronautics Limited (HAL), for their Advanced Light Helicopter, the Dhruv. HAL is manufacturing 157 helicopters for the Indian Army and a commercial version for various customers.

In addition to the above partnerships, Cobham is supplying cockpit avionics for the United States Navy's TH-57 helicopter, and their Synthetic Vision EFIS has been selected to fly on the combined fleets of the Los Angeles Police Department and Los Angeles County Sheriff's Department.

With a proven record of civilian, commercial, special mission, and military helicopter avionics experience, Cobham is uniquely qualified to provide world class equipment for India's breadth and depth of programme needs. •

Allan Cook is Chairman of Selex Galileo

Selix Galileo, a Finmeccanica company, has appointed Allan Cook to the post of company Chairman. Allan Cook's wealth of experience and expertise in the defence and security industry will represent a distinctive asset for Selex Galileo's transnational business.

Allan Cook will maintain his current position at WS Atkins plc, one of the world's leading engineering and design consultancies, where he held the role of Chairman from February 2010. Cook is chairman of the National

Skills Academy for Manufacturing, a Director of Industry Forum and a committee member of the UK Ministerial Advisory Group for Manufacturing.

In late 2010, Mr Cook became chair of the Skills and Jobs Retention Group, a new industry-led and Government-supported group which has been created to ensure that high value skills in the defence sector can be effectively redeployed where there are industrial changes as a result of the UK's Strategic Defence and Security Review. •

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Jose Eduardo Costas
Vice President
Marketing and Sales
Asia Pacific-Executive Jets, Embraer



Embraer expects about 11,000 global deliveries of new executive jets between 2011-2020, representing a total market of \$210 billion. Please note that these are figures for the total market, not Embraer's share alone. Prospects for Asia Pacific are good, in that it is seen as a market for significant growth.

Asia Pacific today accounts for around 4 per cent of the worldwide population of business jets (less than 700 units). In the next 10 years, it is expected that about 1,250 new jets (out of the 11,000 global amount forecast) will be delivered into Asia, which is equivalent to something around \$35 billion. This indicates that in 10 years' time Asia Pacific will be the home of 16.7 per cent of the global fleet of business jets, thus representing an impressive growth (from current 4 per cent) in absolute numbers and in comparison with any other region in the world. Again, please note these are figures related to the total market, encompassing all OEMs, not only Embraer.

We see in India, and in most of Asia, an initial appetite for mid to large aircraft due to mission requirements (longer range). This however does not exclude good opportunities in the entry-level-jet to mid light segments, where new entrepreneurs looking at the market opportunities of providing a differentiated and reliable charter services, with low acquisition cost, low operating cost and state-of-the-art jets like the Phenom 100/300 and the Legacy 450/500. Also, some mid size businesses which are growing as the Asian

economy grows, start looking at alternatives to make their top executives and CEOs more productive as time becomes the most stressing issue to manage.

Price will always be a hot topic, especially in the Asian culture. However, the pre-owned market that was flooded with many bargains since 2008 (very new and low flight hours airplanes were been offered at unbelievable low prices as a result of the financial downturn in the world economy). This depressed the sales of new aircraft in 2008, 2009 and most of 2010. For the manufacturers there was no point in building big amount of new aircraft to compete in such scenario, and thus the production capacity has been significantly reduced in all OEMs. As the market recovers, the low priced aircraft finds new homes and the demand for new products recovers. This is the stage the industry is now, generally speaking.

Embraer's Executive Jets are positioned at the top of their categories and offer ultimate comfort – both for the passengers and also in terms of ease of piloting (thanks for instance, to the fly-by-wire facility found in selected models of the jets) – outstanding performance, clean sheet design, state-of-the-art technology and at low operational cost(s), permit greater work productivity and valuable travel time-savings.

Specifically, our jets are: the entry level Phenom 100 and light Phenom 300, to the mid-light Legacy 450, midsize Legacy 500, super midsize Legacy 600, the large Legacy 650, and the ultra-large Lineage 1000. All of them have been designed to offer cabin sizes and flexible ranges to suit the differing needs of various customers, whether for private use, corporate travel or even business jet charter services for instance.

In India, Embraer has appointed Indamer & Co Pvt Ltd as its authorized service center – based in Mumbai – to provide MRO services for all of the Company's Legacy 600 as well as Phenom 100 aircraft in the country. Embraer has also appointed a Field Support Representative (FSR), based in Mumbai, to provide dedicated technical and maintenance support to all Embraer's executive jets in India. •

Dassault Aviation evaluates Laminar designs in flight for clean sky research programme

Dassault Aviation recently performed a successful flight test to evaluate potential applications of a laminar wing for large business jets. The flight was performed with a Falcon 7X at Dassault's Flight Test Center in Istres, France. The tests are part of the "Smart Fixed Wing Aircraft", one of the Integrated Technology Demonstrators of the European Clean Sky initiative. Clean Sky, one of Europe's largest research initiatives ever, aims to develop technologies for cleaner and quieter next-generation aircraft which will enter service beyond 2020.

The flight evaluated a new infrared (IR) camera technology, developed by FLIR, which is capable of measuring temperature gradients in high altitude/low temperature and pressure environment. The camera measured differences in surface temperatures between laminar and turbulent areas of the horizontal tail plane on the Falcon 7X. While the Falcon 7X is not based on a laminar design, at high altitudes a laminarity of up to 40% was predicted on the upper surface of the horizontal tail. Measurements from the IR camera placed at the top of the vertical tail were performed to provide experimental validation.

"The results, which are still under analysis by Dassault Aviation and ONERA, (the French national aerospace research center) do show laminar extensions as expected," said Philippe Rostand, Future Falcon Programs Project Manager. "The tests also permitted us to qualify new measurements techniques and equipment that will be used in future test flights to be flown by Dassault, Airbus and the other European partners on an even larger scale, such as the 'smart laminar wing' that will be flight tested in 2014 on a modified Airbus A340-300 test aircraft."

Among other aerodynamic innovations, a laminar wing offers the largest potential for a dramatic decrease in drag. Laminar wings are currently only used on sail planes and small business jets. Initial studies indicate a potential 5-10% drag decrease and corresponding reduction in fuel burn and CO2 emissions with a laminar wing design on a large aircraft. Demonstrations and analysis on a larger scale have yet to be performed to confirm possible efficient and safe application on larger aircraft. •

"Powerfly" by Deccan Charters, Taj Air and Business Jets India

Deccan 360, the cargo airline of Capt. G.R.Gopinath, has tied up with Taj Air, air charter company of Tata group and Business Jets India to promote and market airline charter business under the name "Powerfly".

"This is an attempt to tap the top of the pyramid and an attempt to offer seamless travelling solutions in India and abroad," said Gopinath. "Powerfly will have a fleet ranging from helicopters to private jets that can be available (for hire) in the range of Rs.70,000-Rs.3 lakh."

Business Jets, which charters planes to corporates, is backed by Singapore-based Briley Group and Tata group has significant investment in the former. Deccan will bring in 16 planes to Powerfly, including helicopters and turboprop planes, while Taj Air and Business Jets will bring in four planes each, including new Falcon jets. •

Ultra-long range from Gulfstream

Gulfstream has placed the first ultra-long-range G550 aircraft on the Indian civil registry after winning type validation from the Directorate General of Civil Aviation (DGCA) in 2010. The G550 is the current range leader in the business-jet market, with the capability to fly 6,750 nautical miles nonstop.

It joins a growing fleet of Gulfstream jets in the Indian skies, which will soon include the all-new and much-anticipated G650 – the largest, fastest, longest-range purpose-built business jet. The Mach .925 G650 is due for Federal Aviation Administration (FAA) certification next year and entry into service in 2012. The aircraft will have a range of 7,000 nautical miles, connecting Mumbai or New Delhi to London nonstop at very high speed. Alternatively, it will link any two cities across the globe with a maximum of one stop. Gulfstream has a 200-order backlog for the G650, its new flagship aircraft.

Gulfstream has received type validation from the DGCA for many models, including the GIII, GIV, GV, G100, G200, G450 and G500.

"Over a quarter century, Gulfstream has earned a reputation as the preferred provider of private jets to many of the country's business leaders," said Gulf-

stream Regional Vice President Jason Akovenko, who is responsible for the Asia-Pacific region. "The Indian aviation industry is strong and vibrant, and we are excited about the future. Gulfstream continues to expand its commitment in the country by significantly increasing marketing and product support activities to serve our customers."

Air Works in Mumbai has long been an authorized service center, recently supplemented by the presence of a Gulfstream field service representative, Kannan Kumar, in Chennai. In the last year alone, Gulfstream has doubled spare parts at bases in Asia. Globally, it maintains a parts inventory of \$1.2 billion. The company has a service presence on six continents with 44 facilities,

including those of sister company Jet Aviation. This extensive service network assures customers of support wherever they fly.

In the last few years, Gulfstream has seen its sales shift from 60 percent North American to 60 percent international, with much of the shift toward Asian markets. "When we look at the market in India, we see considerable upward potential," said Akovenko. "The country has been enjoying robust economic growth, which has contributed to wealth creation. This has spurred strong demand for private jets." •



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Honeywell partnering with HAL to build engines

Over 25 years ago, Honeywell Aerospace and Hindustan Aeronautics Limited (HAL) launched its successful collaboration with the TPE331-5 engine. The TPE331-12 engine programme builds on this success, producing engine parts—and ultimately engines—for export around the world. Honeywell's TPE-331 turboprop engine provides high performance and lower cost of ownership to business aviation aircraft operators around the world.

TPE331-5 Turboprop Engine

Honeywell licensed its TPE331-5 engine technology to Hindustan Aeronautics Limited (HAL) for manufacturing, which is responsible for engine production as well as full after market service and support for indigenous customers including the Indian Air Force, Coast Guard and Navy. Over 200 TPE331-5 engines from HAL have been fielded till date.

TPE331-12 Turboprop Engine

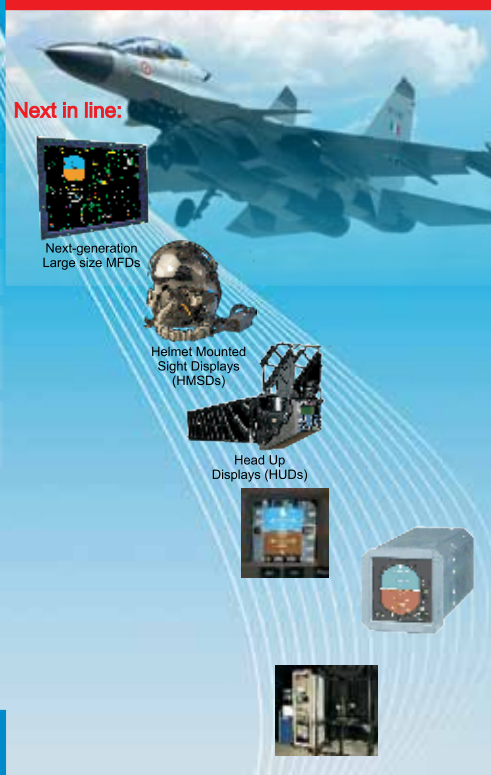
As a result of the success of the TPE331-5 programme, the foundation was set for expansion of business relationship with the TPE331-12 programme, which will ultimately transition full manufacture of the engine to HAL. At the conclusion of the transition, engines produced by HAL will be delivered directly to Indian customers or will be exported to customers around the world.

The first phase of the programme was launched in 2008 and focused on engine components. These components are shipped to Honeywell's engines facility in Phoenix, USA for inclusion in the final engine assembly.

This initial phase includes two manufacturing "waves". Final acceptance through the quality systems at both Honeywell and HAL is the final critical measure for success of the waves. In the first wave, 241 parts are provided by HAL, with over 95 per cent of this wave now complete. The second wave includes over 355 parts, and is currently almost 75 per cent complete.

The second phase of the programme, launched concurrently with Phase 1, was initiated in 2009. Its focus is on engine "kits" which are then forwarded to Phoenix for final assembly, test and shipment to customers. This transition is currently under way, as Honeywell works closely with HAL to ensure quality and volume requirements. •

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Rosoboronexport at Aero India 2011

80+ Defense Systems on Display



MiG-35



Be-200



Mi-28NE

Aerospace systems have been a centrepiece in the defence cooperation between Russia and India since 1964 when the first MiG-21s were delivered. The mutually advantageous collaboration has raised to a strategic partnership level, proved by President Dmitri Medvedev visit last December. A number of important agreements were signed, including a feasibility study contract for the Fifth Generation Fighter Aircraft (FGFA) development.

Another ambitious programme is the Multi-Role Transport Aircraft (MTA) intended for both military services and commercial air lifting.

"We are moving up to deep-rooted cooperation and joint development of advanced systems. It does require a renewed level of trust. It is one thing to sell finished items or assembly them by licence, and it is quite different to implement programmes such as the fifth generation fighter aircraft, transport aircraft MTA or BrahMos missiles. We have already started, as it is, a number of major programmes that will define future defence capabilities of our countries", - pointed out Viktor Komardin, Rosoboronexport deputy director general, who heads company's delegation to the exhibition.

Russia was the first country to transfer to India up-to-date technologies. One of successful examples is a licence production of the Su-30MKI by HAL. This fighter was developed to meet the Indian Air Force requirements. Su-30MKI proved to be a highly effective and reliable system. In 2009 President Pratibha Patil made a flight aboard Su-30MKI.

India also produces by licence the RD-33 series 3 engines for the MiG-29 fighters. The huge operational experience amassed by this type aircraft and existing infrastructure in the IAF give odds to the Russian fighter MiG-35 participating in the MMRCAT tender.

Apart of MiG-35, one can find at Rosoboronexport stand info and mock-

ups of the Yak-130 combat trainer, Su-35 multi-role fighter, two versions of IL-76MD (one powered with the D-30KP, the other - with the PS-90 engine), IL-78MK-90 tanker, MiG-29K and MiG-29KUB ship-borne combat aircraft.

It is expected that visitors will show great interest in the Be-200 multi-role amphibian aircraft which can be equipped, on customer request, with a set of up-to-date open-architecture surveillance and detection systems enabling it to perform maritime reconnaissance, search-and-rescue as well as cargo/troops transportation and medical evacuation missions.



IL-78MK-90



Ka-226T

Rosoboronexport offers a wide range of helicopters. Amongst them a family of the Mi-17s, being delivered these days to the IAF. Proven and effective in operation, these helicopters continue conquering new markets.

Another star is the Mi-28NE helicopter, a bidder in the Indian tender for 22 attack helicopters. Mi-28NE employs a wide range of weapons, boasts unique survivability features, and can operate on all-weather 24/7 basis. These helicopters entered service with the Russian Armed Forces in 2009 to be praised by the pilots.

The Ka-226T light multi-role helicopter participates in the Indian Army tender. Ka-226T advantages - service ceiling, coaxial rotor layout, and options available for various mission modules.

Specialists will undoubtedly be interested in Mi-26T2, a bidder in the Indian heavy lifter tender. The vehicle has no rivals as regards its load-carrying capacity (up to 20 tonnes). Also under display are the Mi-35M combat transport, Ka-31 radar, Ansat and Ka-32A11VS multi-purpose helicopters.

Other attractions include a wide range of weaponry, modern training aids and unmanned air vehicles, the Dozor air monitoring system in particular.

Air defence systems, being among the world's best, form up integral part of the exposition. Air defence assets marketed by Rosoboronexport can build up an integrated system capable of intercepting and defeating targets at various ranges and altitudes.

Information is available on the S-300VM Antey-2500, Tor-M2E and Buk-M2E missile systems, as well as an upgraded version of the Tunguska-M1 gun/missile system. In addition, info on the Igla-S MANPADS and Strelets control equipment and launch modules for Igla-S firing is also available. •



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Fast development of **MC-21** program

Russia is planning to be back to the international single aisle jet airliners' market

The program of developing MC-21 airliner is conducted in precise correspondence with the schedule", - as President of Irkut Corporation Oleg Demchenko commented the program's status.

MC-21 is an ambitious program purposed to return to Russia her solid positions on the international single aisle airliners' market. Irkut is the main contractor of the program and designer of the aircraft. Assembly of MC-21 will be conducted in the city of Irkutsk where Su-30MKI fighters and Yak-130 brand-new combat trainers are manufactured nowadays.

MC-21 airliners' family includes aircrafts with capacity from 150 to 212 passengers and range of flight up to 5,500 km. Program has successfully come through the third gate and is at the design documentation development's stage.

Designers see their task in reducing direct operational costs by 12-15 per cent with parallel significant improvement of passengers' comfort.

This purpose dictated a choice of innovative technical solutions such as employment of a high share of composite materials in the airliner's design. It will contribute to ab. 40% which is much more than up-to-date single aisle airliners employ. It will enable to reduce weight of the design and introduce more efficient aerodynamic configuration with large stretch of wing.

High level of requirements to MC-21's particulars dictated invitation to the program of the leading international producers. MC-21 became the first airliner with capacity of more than 150 passengers featuring the Pratt & Whitney 1400G brand-new turbojet geared engine. The other sub-contractors are Rockwell Collins, Hamilton Sundstrand, Eaton, companies from the French Zodiac group.

Analyzing competitiveness of MC-21, the experts mention that a number of analogous innovations can be also introduced during upgrade of existing single aisle jet airliners. However more advanced aerodynamics and design of fuselage will remain a trump card of MC-21.

Choosing an increased in comparison with competitors' diameter of fuselage Irkut presents a good offer to future passengers. Wider seats and aisle, larger volumes of luggage shelves and compartments, increased windows - all this enables to reach same level of comfort passengers they enjoy in fat-body transcontinental airliners. Increased cross-section also enables to speed up turnaround in the airports and extend flying hours to 150 per year.

Full-sized MC-21 aircraft mock-up was for the first time presented at Farnborough 2010 and was met with interest by airlines. Oleg Demchenko mentions receipt of first orders as a success of 2010. Malaysian Crecom Burj

Resources Ltd signed a contract on delivery of 50 aircrafts. Russia's leading lease companies - VEB-leasing and Ilyushin Finance Co are also among first customers. In September of 2010 Russian Technologies Corporation (RT) ordered the first batch of 50 aircrafts. RT is the Russian largest state industrial holding possessing shares of a number of airlines.

By January 2011 the total number of ordered MC-21s contributes to 190 aircrafts. This is a significant number given current stage of the program's implementation.

According to Irkut's forecasts global market will require more than a thousand of MC-21 aircrafts. Western participants of the program in particular from Pratt & Whitney agree with that assessment. Stable financial and economic positions of Irkut, active support of the Russian Government, efficient international cooperation serve a pledge that plans of MC-21 designers are realistic. •



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BEL banks strongly on it's R&D strengths

I.V. Sarma,
Director (R&D), BEL

SP's Show News (SP's): What are the new R&D initiatives of BEL?

I.V. Sarma (Sarma): As often said Bharat Electronics Limited (BEL) is a R&D driven company. Significant emphasis is given at senior management level for R&D. We have initiated a number of actions recently for further strengthening our R&D. Technology roadmap and three year R&D plan process is being reviewed periodically to initiate futuristic product development. We have also formed technology committees for radars and electro-optics to guide the initiation of projects. Similar teams will be formed for other technology areas also. Considering the importance of microwave components and computing platforms, we have formed teams for new product development in these areas. EW and EO sections have been created in Central Research Lab. We are also introducing a company wide knowledge management (KM) system for synergising the R&D teams located in different units. Proactive in-house R&D and product development will continue to be our emphasis. We are also funding joint development programmes.

SP's: Can you tell us about some of the new products developed by BEL?

Sarma: Every year BEL develops a number of products and subsystems, in addition to concurrent engineering and joint developmental support to DRDO labs. Some of the recent products developed by BEL include integrated air command and control system, combat management system, advanced naval gun fire control system, gap measuring device, laser target designator, multi-function thermal imager, HF transceivers, ground-based mobile ELINT, an electronic warfare system and G3 grade encryptors.

SP's: What are the exciting new projects BEL is working on?

Sarma: R&D at BEL has always been exciting to the engineers, managers and the senior management as well. Some of the projects on which BEL's R&D teams are working and will result in the development of state-of-the-art products are software defined radios, coastal surveillance system, battlefield management system, tactical communication system, future infantry soldier as system, futuristic radars, new generation EW systems and night vision devices and next generation encryptors.

SP's: What is your investment on R&D?

Sarma: We have been continuously increasing our investments in R&D. R&D expenditure of BEL in the last year (2009-10) was Rs 316 crore, which is 6% of our turnover. During the current year, it will be Rs 400 crore, which is an increase of 25% year on year. It will be about 7% of the turnover. We are planning to increase the investment in R&D to 8% of the turnover in two years' time.



SP's: How is your R&D structured?

Sarma: We have a three layered R&D structure which is designed to meet our requirements in this field, in which technology changes at a fast pace. On one end we have the product development teams in SBUs and units with the responsibility of developing products and systems of the respective lines. On the other end we have Central Research Laboratories engaged in futuristic research. They form the foundation for the knowledge base in the company and also interface with academia and other research centres. In the middle we have a group called Central D&E, which is responsible for developing technology modules and critical sub-systems common to many products.

SP's: What is the role of BEL's R&D in defense offsets?

Sarma: Offsets are opportunities for Indian companies to add value while MNCs execute their contracts. Customising our products/sub-systems to integrate with the systems supplied by MNCs is an obvious role our R&D plays. Value addition is also achieved through software development, product engineering, system integration, design of sub-systems, qualification, etc. R&D of BEL carries out all these activities for offsets.

SP's: How is your interaction with DRDO labs?

Sarma: BEL has a long association with DRDO laboratories – nearly five decades. A large number of DRDO products have been inducted into the defence services through BEL. We work with DRDO laboratories on many fronts like product engineering, software development, in-house design of BEL workshare, integration, testing, evaluation and qualification, product and system documentation, etc. We have also started partial funding of some of the DRDO projects.

SP's: What are your strategies for acquiring technology from abroad?

Sarma: Technology support from abroad is required primarily for some of the sub-systems where Indian technology has not matured to meet certain critical performance specifications. We have select technology partnerships for such products. We are also discussing the possibility of joint development. Joint ventures in India with leading MNCs could be another option. •

AgustaWestland signs contracts for two AW139s in India

AgustaWestland, a Finmeccanica company, has announced sale of two more AW139 medium twin helicopters to customers in India. Adani Group has signed a contract for one AW139 to perform VIP/corporate transport missions as well as another corporate customer.

Emilio Dalmasso, Senior Vice President Commercial Business Unit, AgustaWestland said "We are happy to have received these latest orders which bring the total number of AW139s sold in India to almost 20 and continues the success achieved by AgustaWestland's range of helicopters in the Indian commercial market."

The company is proud to have been doing business in India for 40 years and in the last five years over 50 commercial aircraft have been sold comprising AW119Ke single engine, AW109 Power, Grand and GrandNew light twin engine and AW139 medium twin engine helicopters.

A new generation medium twin-turbine helicopter setting new standards against which all new medium twins are measured, the AW139 has been designed with inherent multi-role capability and flexibility of operation, offering unmatched performance and safety levels as well as the largest and the most comfortable cabin in its class. State-of-the-art avionics equipment



and outstanding performance enable the AW139 to accomplish its mission in the most demanding conditions. The AW139 has found great success in India, especially for VIP/corporate and offshore transport purposes. Orders for almost 500 AW139s have been placed by nearly 140 customers from around 50 countries for many applications including VIP/corporate transport, offshore transport, EMS/SAR, law enforcement, fire fighting, utility and other commercial and government roles.

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