



SHOWNEWS

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» INSIDE «



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High Flier at Defexpo

Sachin Pilot,
Union Minister of State,
Communication and IT, inside the
Eurofighter simulator



Congratulations, once again!

Browse through the success story of Defexpo 2010, which showcases a host of promising technological solutions

By Vishal Thapar

Two months ago, a congregation of the biggest and best in the international arms bazaar at New Delhi in mid-February looked improbable. The 6th edition of Defexpo seemed to be precariously placed, with the traditional venue, Pragati Maidan, being taken apart for extensive overhaul ahead of the Commonwealth Games. Worse, there was no industry back-up in organising India's best-known Land and Naval Defence Systems exhibition.

The Ministry of Defence took it upon itself to pull off, what most observers thought was an 11th hour salvage job at an under-renovation venue. What it did pull off, against odds, was the biggest-ever Defexpo, now poised to become one of the premier shows in Asia.

The industry sentiment was reflected in the increase in participation by 45 per cent, and the augmentation of display area by 75 per cent over the Defexpo 2008 tally.

Defence Minister A.K. Antony set the ball rolling, buoying the market with a commitment to increase budgets for India's military modernisation. He provided an overarching vision to give momentum to domestic industry and promote self-



reliance in military acquisitions. A new Defence Procurement Procedure and a Defence Production policy are on the anvil. The Minister promised to

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Boeing pushes its rotors

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FIRING TRIALS STALLED IN MEGA ARTILLERY TENDER

The much-awaited trials in the multi-billion dollar tender for 1,580 towed artillery guns for the Indian Army have been stalled

By Vishal Thapar

Trials for the 155 mm, 52 calibre guns were scheduled to begin in the Kargil Mountains of Jammu & Kashmir in end-

February. The schedule has been thrown in disarray after one of the contenders, ST Kinetics of Singapore, reported damage to its FH-

2000 gun which was to be subjected to field trials, thereby expressing inability to show-up for the trials.

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Naveen Jindal, MP and Industrialist, visits SP's stall in hall 14. He discusses the persisting concerns of the Indian armed forces and the means to address them at higher levels.

FLIR & PCI at Defexpo

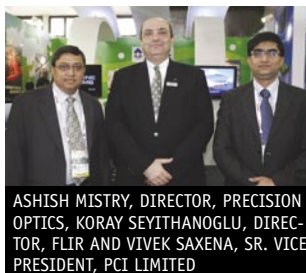
At the defexpo 2010, FLIR with its technology and service partner PCI Limited is showcasing its advanced Gimabll based infrared E/O systems.

FLIR is the largest manufacturer of infrared thermal imaging systems globally. "In India, PCI is our technology and service partner. Currently, we have specific projects with Bharat Electronics and look forward to work with HAL on other projects," Ashish Mistry, Director, Precision Optics.

PCI limited is the technical and service partner of FLIR in India. "The ability to see in darkness gives an extra edge to our forces," said Vivek

Saxena, Sr. Vice President, PCI Limited.

FLIR's success in India is through the Star Safire 111 Systems to be installed on the C-130J's being delivered to India. "Apart from the teaming with Bharat Electronics Limited for specific projects, FLIR is also working on several helicopter projects with HAL," Koray Seyithanoglu, Director, FLIR. •



ASHISH MISTRY, DIRECTOR, PRECISION OPTICS, KORAY SEYITHANOGLU, DIRECTOR, FLIR AND VIVEK SAXENA, SR. VICE PRESIDENT, PCI LIMITED



Nikhil Gandhi, Chairman of Pipavav Shipyard elaborates on the company's strengths

Pipavav Shipyard was conceived by Skill Infrastructure Group. It is a Project of National Importance, which has brought India into the World map of Shipbuilding Nations. The state-of-the-art facilities set up at PSL compare is the best in the world. It has the latest automatic panel line, the largest dry dock in the country and Goliath cranes capable of handling upto 1200 tonnes blocks. The Fitting-out Jetty has berthing length of

684 metres.

With a capacity of handling 144,000 tonnes of steel per annum, PSL stands as the largest engineering facility in the country to meet the growing needs of the Indian Navy and the Coast Guard. Pipavav is an ideal shipyard for faster delivery of quality ships in a cost effective manner. Similarly the shipyard is ready to take on the challenges of being a part of the ambitious plans of the ONGC. •

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Customer Success Is Our Mission

'SDS delivers high-quality products'

Puneet Kaura, Executive Director, Samtel Display Systems

SP's: Can you elaborate the short term goals of the company for Indian defence production?

Puneet Kaura, Executive Director, Samtel Display Systems (SDS): The multifunction displays (MFDs) developed by Samtel under the aegis of DRDO, and further enhanced and manufactured by the Samtel-HAL JV, have been cleared for flight worthiness. They are currently flying on Su30 MKIs. With such proven capabilities, our immediate focus is to indigenise all possible cockpit displays on both fixed-wing and rotary-wing platforms manufactured by HAL. We also plan to become a preferred source of supply of state-of-the-art cockpit displays for international players.

Our focus is also on the MMRCA contract and the opportunity to supply cockpit displays to the winning bidder. Additionally on the cards is the Mirage upgrade which is in advanced stages of discussion. Through our association with Thales, we hope to bag a significant portion of the offset business. Moreover on our radar are the contracts for attack helicopter, Light helicopters and the IJTs.

SP's: What are the prospective defence busi-



ness deals you plan to close with foreign collaborators for production in India?

Kaura: In the defence space, our current portfolio of partners includes industry leaders such as Thales and HAL with whom we hold joint ventures. We are also hopeful of working with Thales for some portion of the upcoming Mirage upgrade. Interestingly, we also have standing MoUs with all the contenders for the MMRCA

contract. These are currently 'Build to Print' arrangements to meet offset obligations.

SP's: How helpful will be the recent changes in TOT policy, incorporated by MOD?

Kaura: With the introduction of the new category 'Buy and Make (Indian)' in the DPP 2009 the production and development by Indian industry will be through transfer of technology and not through Research & Development. Under the earlier procedure in 'Buy and Make' cases, RFP was issued only to foreign vendors, who are required to transfer technology to Indian Defence Industry, called Production Agency. This does not promote setting up of Joint Ventures or Co-production arrangements in India by big foreign OEMs. The new category will help Indian Industry to work out the technological needs and build in-house capabilities in order to meet the future defence requirements.

SP's: Where do you see yourself in 2020?

Kaura: Our key objective for the coming years is to be a complete aerospace company providing end-to-end solutions to our customers and to be viewed as an organization offering world-class products across the globe. •

SAAB & SDS sign MoU

By Sucheta Das Mohapatra

Saab has signed a Memorandum of Understanding with Samtel Display Systems (SDS) to jointly develop, manufacture and market RIGS Head-Up Displays (RIGS HUD) in India. RIGS is a new generation advanced lightweight Head-Up Display designed by Saab to provide helicopters with a cost effective display system. This was announced by Micael Johansson, Senior Vice President and Head of Saab's business area Electronic Defence Systems, and Puneet Kaura, Executive director, Samtel Display System at the Defexpo.

The RIGS will be manufactured at Samtel division in Ghaziabad. Saab and SDS will jointly market RIGS in India to potential Indian customers for the Indian commercial and military airborne market. SDS will be involved in the development of RIGS electronics and software and will also develop and manufacture parts of the RIGS HUD. Initially, the parts manufactured by SDS will be for the Indian market, with the potential of serving International market in the long run.

Speaking about the MoU, Puneet Kaura, Executive Director, SDS said, "Our current goal with reference to this MoU is to help Saab serve the Indian market in the Head-Up Displays segment. But we are hopeful that through our fo-

cus on quality along with cost effectiveness this collaboration will extend to other international markets as well over the next few years."

"India is a very important market for us and is an important cornerstone of our overall global strategy. We are very confident about SDS' technological and manufacturing capabilities and are happy to partner with them. This collaboration marks our next step towards consolidating our position in the Indian aerospace and defence market," said Johansson.

"The RIGS HUD provides pilots with information linked to flight and navigation. It is easy to install, gives all-weather capability, and is ideal for flying and landing helicopters in challenging conditions. Its enhanced vision sensors enables pilots to see through darkness, smog, smoke, rain and fog. It has enhanced capability for early detection of runaway incursions and improved awareness of terrain during the day-night operations," informed Hans Brandtberg, Senior Business Development Executive- Avionics Division, Business Area Electronics Defence Systems. RIGS consist of one or two display units, to serve one or two crew members in a cockpit and an electronics unit. The open systems architecture allows customers to tailor applications their specific needs and to upgrade the system capabilities. •

FMS, the route to success

By Ruchika Chawla



Once again, Raytheon made news at Defexpo during the 'Javelin Joint Venture Media Briefing' with Lockheed Martin on Day 3. Walter Doran, President of Raytheon Asia, and John Ward of Lockheed Martin, Vice President Missile Systems, together pointed out the current success rate of the Javelin- close combat/anti-armor weapon system, around the world and the Indian Army's first exposure to the instrument in October 2009 during a joint exercise between the US and Indian Armies.

Currently going through the Foreign Military Sales (FMS) route to be acquired by the Indian Army, the Javelin has been in production since 1994 and purchased by 11 other countries. "We look at the FMS route as a benefit," said Ward of Raytheon. Optimised for close combat and to destroy armour targets and other vehicles, bunkers, buildings and helicopters; the Javelin features a 95% success rate of on target firing. Doran also emphasised on the minimum time it takes to get trained to fire the Javelin successfully. •



F-16IN SUPER VIPER

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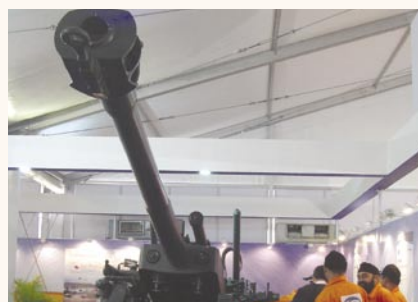
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'Both public and private companies can co-exist'



Atul Punj, Chairman, Punj Lloyd

By Sucheta Das Mohapatra

SP's: Elaborate on Punj Lloyd's initiative in the Defence sector?

Atul Punj (Punj): Punj Lloyd has strategically diversified into the defence industry, under the Government of India's public-private partnership initiative. The company is establishing itself as a credible original equipment manufacturer with focus on state-of-the-art technology. The group's objective is to indigenously develop genuine force multipliers that will provide a decisive edge to the Indian armed forces. We are in the process of developing capability and infrastructure which can be effectively leveraged for defence programmes.

Punj Lloyd's initiatives in the defence sector include:

- **Naval ship building, maintenance and repair:** Punj Lloyd is the co-promoter of Pipavav Shipyard, and is amongst the world's largest shipyard strategically located in the industrialised state of Gujarat with a Dry Dock. It is the largest in South Asia and has nine automated state-of-the-art workshops. It is the only shipyard that can dock Admiral Gorshkov.
- **Manufacture, assembly, MRO of land systems and weapons:** The Group has the license to manufacture guns, rockets, artillery and missile systems, electro optical systems, FCS, C3I systems & power packs associated with armoured fighting vehicles (Tanks & ICVs). The Group is also setting up a world class, state-of-the-art manufacturing and assembly facility at Malanpur, Gwalior, which is expected to be operational by the end of 2010, for potential manufacture, assembly, upgrade, MRO of land systems and weapons such as artillery, missile systems and A-vehicles (T-72, BMP and FICV).

- **MRO:** It is a facility for maintenance, repair, overhaul and modification of aircraft.
- **Design and engineering capability:** PL Engineering, the group's stand alone engineering arm provides design support, engineering animations, analysis, manufacturing support and miscellaneous engineering services
- **Other initiatives:** The Group is also developing capabilities in Defence Electronics & Avionics and has plans to invest in facilities for manufacture of precision aero components, sub systems (sheet metal & composites)

SP's: How do you view the offset clause?

Punj: The Government is developing a comprehensive industrialisation strategy for building defence capabilities. The use of offsets will be a critical part of this strategy. The government is moving in the right direction by ensuring that the offset clause is realised in its full potential.

SP's: What is your opinion about the public/private partnership in the defence sector?

Punj: The Government of India is taking adequate steps to promote public-private partnership in the Indian Defence industry. We believe that both the sectors can benefit from each other's expertise. The market is very large for both the public and private companies to co-exist.

SP's: Ten years from now, where do you see Punj Lloyd in the defence sector? Highlight on some of your major plans.

Punj: The Group has entered this sector from a strategic perspective. We are here as a long term committed partner to fulfill the requirements of the Indian defence sector as per the GoI guidelines. •



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Boeing pushes its rotors



By Priya Tyagi

During the show, Boeing is pushing its host of rotor machines such as Apache Longbow attack helicopter and the heavy lift Chinook. The AH - 64D Apache Longbow, hailed as the 'most advanced multi-role combat helicopter'. The CH-47F and the MH-47G Chinook heavy lift helicopters, come in two variants - one for Standard Logistics and the other, for Special Operations.

The Indian Government has expressed its interest in Chinook,

which is capable of performing long distance, multi-role missions, even at altitudes of up to 20,000ft. The MH-47G has a fully integrated digital Common Avionics Architecture System (CAAS), which permits global communications and navigation. Besides, another product of interest is the V-22 Osprey with an operable radius of about 1000 km.

Boeing has already submitted proposals in October 2009 to the Indian Government for 22 Apache and 15 Chinook helicopters. •



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'Don't doubt our reliability'



US Ambassador Timothy Roemer in an exclusive interview to SP's ShowNews vouches for direct Government to overnment sales and describes Indo-US defence trade as a 'strategic win-win' for both sides

“ The world has changed dramatically in the past decade, and the Indo-US relationship has become closer, deeper and more reliable. Our commitment to India is enduring and the reliability of the US as a weapons supplier to India should not be doubted. ”

SP's: Indo-US Defence cooperation has been described as a great success story of the last decade. What will drive this relationship forward?

Timothy Roemer (Roemer): As President Obama says, “This US-India relationship is an indispensable partnership based on many principles. There are many convergent issues and shared aspirations driving not only the unprecedented defence cooperation between our two countries, but the cooperation in all fields of human endeavour our countries enjoy – from counter— terrorism to climate change, education to women's empowerment, and science to security. As Defence Secretary Gates mentioned on his recent visit here, going forward, India can be an anchor for regional and global security.

SP's: The US has been the biggest exhibitor at the last few editions of Defexpo. What's the message for India and the rest of the world?

Roemer: With the Indian economy's tremendous growth, this is a great place to do business – not just in terms of sales, but also in manufacturing, and engineering centres. US manufacturers benefit substantially from Indian services when you consider reliability and life-cycle costs.

Alternatively, US products are increasingly of interest to the Indian military. We offer some of the finest innovations, technology, and equipment in the world, and are proud to share this with one of our greatest global partners. Business between the United States and India is a strategic win-win for both countries.

SP's: If one of the two US companies in the fray was to bag the Indian order for 126 fighter aircraft, could that be the defining moment, or the stimulus, to propel defence-industrial ties?

Roemer: I wouldn't put too much emphasis on any one competition. As I mentioned, ours is a broad and deep, global partnership spanning the full spectrum of human endeavour. US manufacturers produce leading equipment with world-class technology. We are committed to sharing our technology and insights with India as a global partner. This competition for the MMRCAs is certainly important and America is eager to compete for it in an open and fair manner.

SP's: The reliability of the US as a weapons supplier to India has often been commented upon. Does political distrust still limit the potential of Indo-US defence ties?

Roemer: The world has changed dramatically in the past decade, and the Indo-US relationship has become closer, deeper and more reliable. Our commitment to India is enduring and the reliability of the US as a weapons supplier to India should not be doubted. Our shared values transcend any changes in our respective governments. From

Republican to Democratic administrations, from Presidents Clinton and Bush, now to President Obama, all have emphasised the vital partnership and global cooperation between our countries.

SP's: Could the continuing impasse over pacts like CISMOA and Logistics Support Agreement limit the scope of defence ties with India?

Roemer: As our Defense Secretary Gates recently said on his visit to India, these agreements are preponderantly in India's benefit because they give high tech systems additional high tech capabilities. They are enablers to the highest quality equipment in the Indian armed forces. These agreements, at the end of the day, are focused on protecting the technology of both India and the United States, and are in the interest of both countries as we move forward.

SP's: For a country like India, is Foreign Military Sales (FMS) the most assured and reliable route for defence trade with the US at this stage?

Roemer: The government-to-government FMS route offers you assurances that you are buying the highest quality equipment being used by the US military and thus offers benefits such as quantity discounts, technical support, and an established, reliable supply system. From those perspectives, FMS is a very reliable option for our continued defense trade.

SP's: What is the scope for cooperation in building up India's homeland security and counter-terrorism capability? Could this also be a big driver for Indo-US defence trade?

Roemer: Our two countries enjoy an unprecedented level of cooperation and information sharing in the fields of homeland security and counter-terrorism. The US will continue to work closely with India in these critical areas to strengthen our combined efforts and to fight the global terrorism that threatens our citizens where they live, study, work, and worship.

SP's: How do you visualise Indo-US defence engagement evolving? What is the next level of the Indo-US military engagement?

Roemer: I believe we will see a steady expansion of engagement across the board – from collaboration on humanitarian, disaster relief, and maritime security efforts through exchanges, exercises and defense sales. The sky is literally the limit as, together, our two countries forge ahead solving some of the greatest challenges facing the 21st century. •

(This interview has been published in an abridged form. The full interview will appear in the next editions of SP's various publications.)




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Remote controlled weapon stations by Rafael

The Samson-RCWS is an advanced development of the previous generation's Overhead Weapon Stations (OWS), which were pioneered jointly by Rafael and the Israeli Defense Forces (IDF) to provide the best available protection for the crew.

The Samson-RCWS design is based on the principle of mounting the weapon in an external, above deck mount, while the gunner is located under the vehicle deck in any convenient position and protected by the vehicle's armour.

The remote controlled concept provides the most cost-effective and compliant solution in terms of light weight, low silhouette, ease of integration to all vehicle variants and minimal associated cost. The additional benefits include excellent Human Engineering Factors (HEF), ballistic protection, ease of operation, isolation from firing effects, easy



NBC protection while firing the weapon, and efficient use of inner vehicle space.

The day and night sight enables round-the-clock effective surveillance and operation.

The Mini-Samson-RCWS enables the crew of an armoured vehicle to operate different caliber weapons (7.62 mm and 12.7 mm machine guns, 40 mm AGL, medium caliber cannons with caliber up to 40 mm, integrated Spike ATGM or other similar missiles) and integrated sensors of various kinds. It is installed on the vehicle's deck, operated from within with minimal interference with the other vehicle systems.

The Samson-RCWS can be stabilised for "on the move" target acquisition and firing. It can be slaved to direction data obtained from an external target acquisition system or Battle Management System (BMS), or conversely provide target positioning and directional data to friendly forces through the BMS.

The Samson-RCWS has full manual back-up capabilities. Optionally, it can be controlled and operated from the Commander's position, who can take over for the Gunner if the latter is incapacitated.

The Samson weapon stations have a low silhouette, enabling air transportation of the carrier vehicle without any further preparation.

The high elevation angles enable tracking and shooting at targets (snipers etc.) in high rise buildings.

Being lightweight, with no deck penetration necessary for its installation (except for the two interface harnesses), the Samson-RCWS can be easily mounted on any vehicle type at any hatch location with minimum interference.

It is designed to operate within full specification in all climatic theatres. The Samson-RCWS has been chosen by the US, UK, Canadian and Turkish land forces and IDF to equip their fighting troops. Other armed forces show a great interest in the concept and in the system.

The Samson Family includes:

- Samson JR. for 5.56 mm and 7.62 mm weapons
- Mini-Samson for 7.62 and 12.7 mm weapons
- Samson RCWS for 30 mm cannon, anti-tank missiles, smoke grenades and other weapons •

ThyssenKrupp Marine Systems: New Technologies for Naval Surface Vessels

The surface division of ThyssenKrupp Marine Systems (TKMS) includes Germany's best known naval shipbuilder, Blohm + Voss, and Sweden's Kockums.

Together, they are an international driving force for new technologies in naval shipbuilding. Their new developments and designs continually prove themselves worldwide.

TKMS is the global pathfinder for modern stealth technology for naval vessels. The first VISBY class corvette built with composite materials went into service as early as 1990. Shortly afterwards, the four steel-hull MEKO® 200 SAN frigates left the shipyards. They are extremely difficult to locate due to their low infrared and radar signature design and technology.

The design of these types shows that groundbreaking ideas have become a reality at TKMS. The VISBY, with its smooth exterior walls made of non-magnetic composite materials, concealed onboard equipment and low-signature construction, is barely visible to radar and sets new standards in the stealth properties of naval surface vessels.

TKMS consistently applies stealth technology and innovative, signature-reducing elements to all new ship designs. Underwater exhaust outlets with low wakes and the most modern sensor and radar technology ensure that the acoustic and sensory signatures are barely measurable. TKMS has the longest experience worldwide in the design and construction of stealth technology.

TKMS also relies on state-of-the-art propulsion technology. COD-LAG propulsion (combined diesel-electric and gas turbine) combines three different systems: diesel engines, electric motors and gas turbines. Without gearing, two electric motors directly drive a low-noise and progressively controllable shaft for a cruising speed of up to 20 knots. Under mission conditions, a gas turbine is added to the power mix and ships can accelerate to more than 40 knots. Four diesel engines combined in an energy pool generate the power required for the electric motors and for the on-board systems. The engines are controlled according to the required power and are cut in or out individually as needed. This energy management reduces fuel consumption to the minimum level needed at any given time. The TKMS propulsion system allows long service intervals of up to two years.

The MEKO® concept developed by TKMS is based on the principle of interchangeable modules allowing for a very flexible deployment of frigates and corvettes. The container-like modules include complete systems connected to the on-board networks via standardised interfaces. MEKO® Technology-equipped vessels can be adjusted to specific mission functionality or combat requirements very quickly. The MEKO® modules are produced independently of the shipbuilding process, considerably accelerating the construction period for new naval ships.

Another advantage of the MEKO® concept is the ability to retrofit ships. The system makes upgradation in current technological standards. The concept has proven itself for over more than 30 years.

TKMS continuously works to improve the MEKO® approach. The module system that has established itself in the naval sector is now being transferred to civilian shipbuilding. This principle will be applied for the first time on the civilian MEKO® MESHD – Multi-Role Expeditionary Support Helicopter Dock. •

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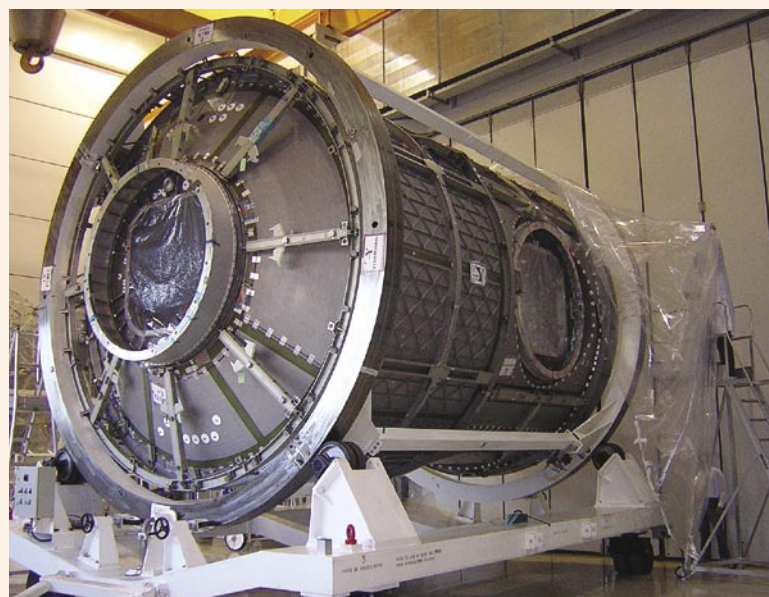
US Army Awards General Dynamics \$253 Million for Stryker Logistic Support

The US Army TACOM Lifecycle Management Command recently awarded General Dynamics Land Systems, a business unit of General Dynamics (NYSE: GD) \$253 million (Rs 1,175 crore) for contractor logistics support of the Stryker family of combat vehicles. Logistics support, vehicle resets and upgrades are a continuing portion of General Dynamics' combat systems-related business.

The contract awarded on January 28, 2010, funds contractor support of US Army Stryker Brigade Combat Teams in the United States and overseas, including ordering spare parts, managing a spare-parts warehouse, worldwide distribution of repair parts and completing maintenance services on the Stryker vehicle fleet. Work will be performed by existing General Dynamics employees in Alaska, Hawaii, Michigan, Pennsylvania, Texas, Washington, and overseas in Afghanistan, Germany, Iraq and Kuwait. The period of performance is March 1, 2010 through February 28, 2011. •



Thales Alenia Space's successful launches



Shuttle Endeavour has lifted off from NASA's Kennedy Space Centre in Cape Canaveral, Florida, on the STS-130 mission with the Node 3 and Cupola on board – a module and a workstation both fully built in Thales Alenia Space's plant in Turin.

Node 3 and Cupola, two true jewels of technology, reached the International Space Station after a two-day journey, to become key elements of the completed ISS structure and support its operations.

"Our company and indeed the entire European space industry, is extremely proud of this new launch," declares Luigi Pasquali, Chairman and CEO of Thales Alenia Space Italy.

"It gives further evidence of the great skills and important international role we have played in this ambitious International Space Station project. This success is a result of all the work and energy we invested in developing the living spaces with account for more than 50 per cent of the pressurised elements of the orbiting home. It is a very valuable technological commitment that allows us to enjoy the status of one of the major international industrial players in the development of orbiting infrastructures and space return and transport systems," he adds.

"For decades, Thales Alenia Space has been better known as a provider for communication, weather and remote sensing satellites as well as for our unmanned space probes. In addition to our role in space applications for serving and securing citizens, I think it's now time that we also be known as a trusted provider of 'living and life giving space' for human space flight," says Reynald Seznec, chairman and CEO of Thales Alenia Space. "Our demonstrated capabilities and skills enabled us to become a major partner in NASA's Commercial Orbital Transportation Service programme – with our contribution to the Cygnus resupply vehicle - and we will play a key role in keeping the ISS operational through 2015 and, hopefully, well beyond this date," he adds.

Node 3, dubbed 'Tranquility' by NASA, is the second connecting node module built by Thales Alenia Space and commissioned by the European Space Agency (ESA) as part of its Columbus Launch barter agreement with NASA. Its twin, Node 2 "Harmony", also built in Turin, has been docked to the ISS since October 2007. This can-shaped module, about the size of a double-decker bus, will provide berthing locations for future modules or vehicles while expanding the habitable volume of the ISS by 75 cubic metres. It features standardised interfaces to accommodate research racks and living quarters. Moreover, Node 3 is equipped with the most sophisticated environmental and life support system ever flown in space, which will not only recycle water and generate oxygen but will also purify the atmosphere from toxic substances and measure their components.

The Cupola workstation is a spectacular, technological robotised control room that will allow two astronauts to work with a direct view on the outside of the ISS. It is a truly exceptional observatory for surveying the cosmos and our planet, consisting of seven windows, six to the sides and one above, thereby providing a 360 degree view of space.

Each window is composed of two 25-mm thick panes with two thinner panes for damage protection from the inside and the outside. These are the largest windows ever mounted on a manned space station. Once operational, it will be used as the station's "flight control center", monitoring all incoming and departing vehicles.

In order to ensure the success of the programme, Thales Alenia Space has also supplied the support to NASA in carrying out the final tests and preparation for launch. Activities that are set to continue throughout all stages of the future mission, and are provided by the Altec Centre, a company set up jointly by Thales Alenia Space, the Italian Space Agency (ASI) and public bodies from the Piedmont region. •



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BAE Systems unveils new modernised Howitzer vehicle for US Army

BAE Systems today unveiled its upgraded PIM (Paladin Integrated Management) vehicle to military customers, Congressional representatives, community leaders and employees at a ceremony held at its York facility. PIM is the next generation howitzer in the M-109 Paladin family of vehicles, a combat proven weapon system manufactured by BAE Systems at York.

"The modernisation of the Paladin is a critical step in providing the Army with a sustainable and supportable fleet of upgraded vehicles," said Joe McCarthy, vice president and general manager of the Heavy Brigade Combat Team (HBCT) systems for BAE Systems. "The roll-out of our PIM system will ensure that the HBCT continues to have the premier Fire Support Platform needed to support the warfighter," he added.

BAE Systems was awarded a contract in August 2009 to produce seven PIM vehicles: five Self Propelled Howitzers and two Field Artillery Ammunition Support Vehicles.

The PIM uses the existing main armament and cab structure of a Paladin M109A6 and replaces the out-of-date chassis components with up-to-date components from Bradley Combat Systems. PIM incorporates a state-of-the-art "digital backbone" and robust power generation capability and integrates electric elevation and traverse drives, electric rammer and digital fire control system. The upgradation of the PIM ensures maximum commonality with existing systems in the Heavy Brigade Combat Team (HBCT), and reduces its logistical footprint and operational sustainability costs by replacing obsolete components within the mobility chassis.

The BAE Systems Paladin Integrated Management vehicle is the first production vehicle equipped with the company's enhanced on-board power management capability, representing the first implementation of the US Army's Common Modular Power System (CMPS) requirement. BAE Systems enhanced on-board power management solutions will double the electrical power of most military vehicles, exponentially increasing the mission effectiveness of ground forces in theatre.

Design and engineering analysis work for the vehicle structure, automotive systems and electric and vehicle electronics will be performed at the BAE Systems facilities in Pennsylvania, California, New York, Minnesota and Michigan as well as US Government facilities at the Army Research and Development Center in Picatinny, New Jersey. The remanufacture for the Paladin fleet will be performed in partnership with the Anniston Army Depot in Alabama and at BAE Systems facilities in York, Pennsylvania and Elgin, Oklahoma. •

Raytheon BBN Technologies demonstrates first-of-its-kind Disruption-Tolerant Military Network

Raytheon BBN Technologies demonstrated the successful transmission of voice and data across a wireless mobile ad hoc network that was in a constant state of flux, impersonating the communications challenges that military networks confront in tactical use.

These results mark milestone achievements for the Wireless Network After Next (WNaN) programme, which is sponsored by the Defense Advanced Research Projects Agency and the Air Force Research Laboratory.

Raytheon BBN Technologies is a wholly owned subsidiary of Raytheon Company (NYSE: RTN).

"The results prove that WNaN works in the field with affordable, commercially available radios," said Jason Redi, WNaN principal investigator, Raytheon BBN Technologies. "With these results, we are one step closer to getting this much needed, first-of-its-kind technology to the battlefield and putting a reliable network in the hands of every warfighter," he added.

The WNaN network operates on low-cost radio hardware to establish a wireless network that adapts to changing conditions and enables war-fighters to communicate on the battlefield despite frequent disruptions and high demand. Raytheon BBN Technology network software operates in concert with radio hardware developed by COBHAM.

The specific achievements during the field experiment included:

- 10 WNaN mobile handheld radios that participated in multiple, simultaneous call groups and delivered situational awareness data despite communications disruptions
- Proof of the network's ability to avoid interference from hostile signals and continue operation even when large numbers of war-fighters try to use the channel at once
- Software that automatically assigns the best frequencies for use by each device as the war-fighters move and the mission requires change
- Techniques that allow the network to scale to hundreds of nodes in a single group without the need for a fixed network infrastructure
- Capability to relay voice transparently over more than four different network radios so that soldiers can communicate reliably regardless of their location in the battlefield •

India developing Anti-Satellite Spacecraft

India has begun development of lasers and an exo-atmospheric kill vehicle that could be combined to produce a weapon to destroy enemy satellites in orbit.

"The kill vehicle, which is needed for intercepting the satellite, needs to be developed, and that work is going on as part of the ballistic missile defence programme," said V.K. Saraswat, director-general, Defence Research and Development Organisation.

In a televised press briefing during the 97th Indian Science Congress in Thiruvananthapuram, Saraswat said the programme includes the development of lasers which will be able to give a concrete picture of the satellite, and use that picture to guide your kill vehicle towards that. That work has yet to be done.

India is not the first country to announce plans for anti-satellite spacecraft. In 2007, China

intentionally destroyed an old weather satellite during an anti-satellite demonstration that created a swarm of orbital debris above Earth.

The United States also successfully destroyed a crippled spy satellite in 2008 with an SM-3 missile launched from a Navy ship. That satellite kill was ordered to destroy the falling satellite to avoid toxic debris from raining down on parts of the US, military officials said. •

INTEGRITY IN ACTION



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PURPOSE	STRONG PARTNERSHIPS
FUNCTION	MUTUAL GAIN
ETHOS	INTEGRITY



Royal Netherlands Air Force selects AAI's Advanced Boresight Equipment for helicopter platforms

AAI Corporation, an operating unit of Textron Systems, a Textron Inc. (NYSE: TXT) company has announced that the Royal Netherlands Air Force has selected its Advanced Boresight Equipment (ABE®) for aircraft harmonisation on the AH-64D Apache Longbow® and CH-47F Chinook® helicopters.

ABE is a gyro-stabilised, electro-optical angular measurement system designed to align

aircraft subsystems. Under these new awards valued at, AAI will deliver an additional ABE AH-64D Apache Depot Boresight System to align various sensor, weapon and sighting systems, as well as an additional ABE AH-64D Apache Maintenance Aircraft Survivability Equipment (AMASE) Boresight Kit for AMASE alignment. AAI's ABE Boresight solution has supported the AH-64D Apache for the Royal

Netherlands Air Force since 2004.

In addition, AAI's ABE system has been selected as the harmonisation solution for the Royal Netherlands Air Force's CH-47F Chinook aircraft survivability equipment. Under these awards, AAI will design, develop and deliver adapters, platform-specific firmware called a personality module, training and manuals.

"AAI is committed to creating reliable, cost-effective test solutions that provide confidence to warfighters. ABE is the Boresighting solution of choice for dozens of platforms in several countries," says Vice President of Test & Training Systems Robert Peters. "Not only is it a proven, accurate and repeatable resource, it minimises harmonisation time and required manpower. The Royal Netherlands Air Force will now use our common ABE Model 310A alignment system on both of these helicopter platforms," he adds. •

IAI-Made UAS in Operational Use by Five Armed Forces in Afghanistan

The Canadian, French, German and Australian air forces and the Spanish army have all chosen to employ Israel Aerospace Industries' (IAI) Unmanned Aerial Systems (UAS) to support their troops fighting in Afghanistan. The Canadian and the French air forces have both utilised IAI's Heron UAS, while the Spanish army uses IAI's Searcher III UAS. In addition, the Heron UAS will be operational with the German and Australian air forces in the coming months. The troops in Afghanistan rely heavily on these UASs, as they provide crucial intelligence, surveillance, and reconnaissance (ISR) information in real-time to commanders and directly to front line soldiers.

The Heron is a Medium Altitude Long Endurance (MALE) UAS for strategic and tactical missions. With a wingspan of 16.6 m and a takeoff weight of 1,250 kg, the Heron UAV can reach an altitude of 30,000 ft and has the endurance of up to 50 hours (pending on the mission and payload configuration).

Heron's size has far-reaching significance in terms of its ability to carry a wide variety of sensors, which can provide real-time information over a wide area for an extended period. The Heron has a low acoustic signature, making it difficult to detect.

In August 2008, MacDonald, Dettwiler and Associates Ltd (MDA) of Richmond, B.C. Canada was awarded a \$95 million (CAD) contract for a long endurance UAV surveillance solution to support the Canadian forces in Afghanistan. IAI's MALAT Division, as the major subcontractor, supplied the Heron UAS for this critical service. The platform and equipment are built at IAI's facilities in Israel, while management, training, and in-theatre maintenance for the Canadian operators is the responsibility of the Canadian prime contractor, MDA.

The French Air Force has put the Heron, known in France as Systeme Interimaire de Drone MALE (SIDM) into operational use with European Aeronautic Defense and Space (EADS) acting as a prime contractor and IAI as subcontractor. The French MALE UAV performed its maiden flight in Afghanistan on February 17, 2009. The SIDM provides the French forces with up to 20 hours of surveillance capability per mission. It carries electro optical sensors, a laser designator, and a Synthetic Aperture



Radar (SAR) with ground moving target indicator (GMTI) capability.

December 2009 marked the first delivery of the Heron Unmanned Aerial System (UAS) to the Canadian company MDA, and to the customer, the Royal Australian Air Force (RAAF). The Australian Department of Defense (DOD) had awarded a contract to MDA to supply Heron systems to Australia for operations by the RAAF in Afghanistan for ISR missions as part of Project NANKEEN. The Heron was chosen from among a number of UAS competitors, after successfully completing a series of tests, for its ISR capabilities. The Heron system will start operations

with the RAAF in early 2010 for one year, with the option to extend for another two years.

Rheinmetall Defence and the German Federal Office of Defense Technology and Procurement signed a service provider contract in October 2009 to provide the German Bundeswehr with ISR capabilities through the deployment of a UAV system. Under the current multimillion-euro contract, the Bundeswehr will lease the UAV system for one year with an option for a two year extension. Flight operations will commence by mid March 2010. Compared to UAV systems currently in service with the Bundeswehr, the UAS to be deployed is capable of covering a substantially larger footprint, while its high-performance sensors can provide reconnaissance data, even under severe weather conditions. Rheinmetall Defence and IAI will provide IAI's Heron MALE UAV system, including full in-theatre logistical and maintenance services performed by Rheinmetall Defence. Missions of the UAV system will be performed and controlled by Bundeswehr personnel.

In 2007, IAI, together with the Spanish companies INDRA and EADS-CASA, won a tender published by the Spanish Ministry of Defense for a tactical UAS for the Spanish Army. The system was delivered early 2008 and immediately deployed in Afghanistan.

Since then it has been in continuous and successful use by the Spanish Army for ISR missions using a high performance day & night E/O payload. •



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IAI conducts successful firing trial of LAHAT Missiles

Israel Aerospace Industries (IAI) has conducted a successful firing trial of two Laser Homing Attack (LAHAT) laser-guided missiles from an Israel Air Force (IAF) COBRA helicopter. The missiles were fired from the helicopter at ranges of 3.5 km and 7 km, resulting in direct impact on the targets.

"The LAHAT missile system was based on the company's long history of advanced laser weapon systems for air and ground forces," said Itzhak Nissan, President and CEO of IAI. "For more than 30 years, IAI's MBT Division has been the main Israeli supplier for laser guided munitions for the Israel Defense Forces, as well as for many other satisfied customers worldwide. We are very satisfied with this latest round of firing trials."

The LAHAT lightweight precision guided weapon utilises a semi-active laser homing guidance method, and can be fired from the barrel of a tank gun, from light vehicles and from light helicopters, hitting targets with pinpoint accuracy at ranges of up to 8 km. It is effective against armoured targets and in the war against terrorism.

LAHAT is also effective in urban areas, where a low collateral damage solution is absolutely required. The missile strikes both stationary and moving targets designated for the attack, and can be launched either from a firing platform or by an indirect designation such as a helicopter, Unmanned Aerial Vehicle (UAV) or a forward observer. •

SAGEM wins French government contract for Version 5 of the SLPRM mission planning system for French combat aircraft

In late December 2009, French defense procurement agency DGA announced the contract award to Sagem (Safran group) for the development and supply of SLPRM V5, including three years of system maintenance services.

The SLPRM (Système Local de Préparation et de Restitution de Missions) mission planning and debriefing system, developed for the Rafale omnivore fighter, is a key to efficient mission planning and debriefing.

It is used on different combat aircraft deployed by the French air force and navy, and supports all stores configurations. SLPRM integrates the latest Rafale F3 standard, as well as the latest guided air-to-ground weapons, including the ASMP-A nuclear cruise missile, Scalp conventional cruise missile and AASM modular air-to-ground weapon, developed and produced by Sagem, along with the Reco-NG optronics reconnaissance pod.

SLPRM V5 will feature new software, especially for the mapping function, plus an optimized, scalable architecture. It can run on a laptop computer, for simplified maintenance.

The SLPRM V5 contract was awarded within the scope of France's economic stimulus plan, enabling this upgraded version to be delivered ahead of schedule to the French air force and navy.

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

General Dynamics awarded \$33 million order for armour tile sets

General Dynamics Armament and Technical Products has been awarded an order of approximately \$33 million (153 crore) to produce reactive armour tile sets for the Bradley Fighting Vehicle by the US Army Contracting Command in Picatinny Arsenal, N.J. Deliveries are expected to begin in June 2010. General Dynamics Armament and Technical Products is a business unit of General Dynamics (NYSE: GD).

Work will be performed at the General Dynamics' facility in McHenry, Miss., and deliveries are expected to be completed by November 2010. The programme will be managed from General Dynamics' Burlington

Technology Centre in Vermont. The order is an extension of a contract awarded in 2006. A strategic partner, Rafael Advanced Defense Systems Ltd, Ordnance and Protection Division, will share the production workload in Haifa, Israel.

General Dynamics' reactive armour system is composed of tiles that fasten to the exterior of the Bradley Fighting Vehicle, allowing it to better withstand direct hits from a variety of anti-armour munitions.

"Our reactive armour package is a lightweight solution that can defeat full-scale, shape-charge threats of modern, long-range anti-tank missiles," said Russ Klein, vice president and general manager of weapon systems

for General Dynamics Armament and Technical Products. "Our team in McHenry is proud to produce reactive armour tiles that save lives and prevent severe damage to combat vehicles in Iraq," he added.

General Dynamics Armament and Technical Products, located in Charlotte, N.C., provide a broad range of system solutions for military and commercial applications. The company designs, develops and produces high-performance weapon and armament systems, defensive armour, countermeasure systems and aerospace composite solutions, as well as off-road axle and suspension systems. It is also a leading US producer of biological and chemical detection systems. •

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Bombardier 415

Amphibious Firefighting Aircraft

Bombardier Aerospace has announced the sale of Bombardier 415 amphibious aircraft to an undisclosed customer. Both the customer's identity and the number of aircraft have remained undisclosed. Based on current list price, the contract is valued at approximately \$126 million (Rs 589 crore) and includes training and technical support. Deliveries of the aircraft will begin during the fourth quarter of 2010 and will continue upto 2012.

"Since its launch in 1994, the Bombardier 415 aircraft has consistently proved itself to be a reliable and effective firefighting tool. The aircraft's unique operational capabilities and exceptional performance allow it to operate in the most rugged and demanding circumstances, and is recognised around the world as the most effective firefighting aircraft available," said Michel Bourgeois, President, Bombardier Specialised and Amphibious Aircraft.

Since the first Bombardier 415 amphibious aircraft was delivered in 1994, a total of four Bombardier 415 MP and 71 Bombardier 415 aircraft have been delivered to governments and firefighting agencies in Croatia, France, Greece, Italy, Malaysia, Ontario, Québec and Spain. In addition, 66 CL-215 amphibious piston aircraft remain in service.

The Bombardier 415 firefighter aircraft has a maximum speed of 224 mph (359 km/h) under certain conditions. In an average mission of six nautical miles (11 km) distance from water to fire, it can complete nine drops within an hour and deliver 14,589 US gallons (55,233 litres) of fire suppressant. •



D-SIMLAB Technologies & EADS

Innovation Works collaborate

D-SIMLAB Technologies Pte Ltd ("D-SIMLAB"), the Singapore-headquartered leading provider of high-performance, simulation-based decision support solutions, and EADS Innovation Works Singapore, have signed a Memorandum of Understanding (MOU). The MOU will pave the way for D-SIMLAB and EADS to undertake and promote joint collaboration activities and projects for the purpose of establishing and advancing new service models and logistics policies for spare parts.

D-SIMLAB's flagship product for the aviation industry is D-SIMPAIR, an advanced simulation-based spare parts planning and optimisation system. D-SIMPAIR enables the ongoing paradigm shift in the aviation industry. It can be applied across the entire lifecycle of spare parts logistics network. The product has seen increased acceptance by multinational customers. It aims to become the de-facto tool to study, develop and execute component support contracts in the aviation industry. In June 2009, D-SIMLAB also received a prestigious Proof-of-Value (POV) grant under SPRING Singapore's Technology Enterprise Commercialisation Scheme (TECS) to further extend D-SIMPAIR to include a novel "symbiotic simulation" framework. This MOU is aimed to extend partnership between D-SIMLAB and EADS for development of new spare parts logistics policies for future Airbus aircraft platforms and analysis of advanced spare parts logistics policies for mission-centric flight operations. This would also open up the military market for D-SIMPAIR, a mission centric version of which is presently under development.

The MOU is an endorsement that D-SIMLAB Technologies' capabilities and technology innovativeness meet critical enterprise needs for a spare parts service optimisation solution. Gan Yeow Beng, head of EADS IW Sin-

gapore said, "D-SIMLAB is an important partner in advancing our spares management capabilities. Leaner operations and better service levels for our customers, is an essential priority for EADS, and we are delighted to be a key driver for the development of this tool. With this new MOU in place, our research can move even faster and further."

Exploit Technologies had incubated D-SIMLAB for close to 18 months when the company first started business in 2007. On D-SIMLAB's tie-up with EADS, Mr Philip Lim, CEO, Exploit Technologies, said, "We are delighted that a forward-looking MNC like EADS finds a natural partner in D-SIMLAB, a company that we have helped grow at an early stage both its technology roadmap and business plan. This new partnership is a strong testimony of D-SIMLAB's capability and potential. We are confident that D-SIMLAB will be able to meet EADS' advanced technology needs, and help enhance the future of spare parts logistics management in civil and military aviation." D-SIMPAIR's engine was developed by the founding team at Singapore Institute of Manufacturing Technology (SIMTech).

Dr. Peter Lendermann, CEO, D-SIMLAB Technologies, who has been leading the team all the way since its SIMTech days said, "This is a great milestone for D-SIMLAB. Although we have already been working with a number of Aerospace companies, with this formal engagement with EADS, we can confidently claim that D-SIMLAB has evolved from a high-tech start-up into an established player and even a leader for providing simulation-based decision support solutions for spare component service optimisation. This will also strengthen the relationship with our present customers as a validation of the support they have provided since our early years." •

Firing trials stalled in mega artillery tender

Continued from page 1

"The auxiliary power unit of the howitzer was damaged while it was being loaded into an aircraft to be brought to India," sources claimed.

Consequent to this claim, the Indian Army has informed the competing companies that the trials will be rescheduled. The guns were to be airlifted from Chandigarh to Leh by the Indian Air Force and then to be moved to the trial area in Kargil by road after the conclusion of Defexpo 2010 in New Delhi.

Three weeks of winter trials in Kargil were to be followed by another three weeks of summer trials in Rajasthan in April-May, according to the original schedule. Environment and Maintenance Evaluation tests were to be done in October.

Only two guns, which are on the final short-list, will be tried out. These are the BAE FH-77 B05 and the FH-2000 of ST Kinetics. Two more guns were rejected following technical scrutiny of the tender bids; the German Rheinmetall's RWG-52 and the Israeli Soltam's Athos.

India's Defence Procurement Procedures discourage single-vendor situations and put weight on multi-cornered contests in open tenders. "Winter trials will now have to be pushed to the next season. This could result in a year's delay in evaluation," sources admitted.

The BAE FH-77 B05 is displayed at Defexpo. The same gun is to be used for the firing trials in Kargil and Rajasthan.

ST Kinetics has claimed the longest experience in manufacturing 155 mm, 52 calibre artillery guns. The first of the FH-2000 guns were inducted in service as far back as 1993. The Singapore Army is equipped with this weapon. Some observers wonder why a replacement for the damaged guns could not be managed despite the Singapore Army having this weapon in large numbers.

The Indian Army's artillery acquisition programme has been defined by excruciating delay. Extensive multi-vendor trials to select a new howitzer for the Indian Army started in 2002, after the importance of artillery firepower was underscored in the Indo-Pak conflict at Kargil. Five pain-staking rounds of trials later, the tender was abruptly cancelled in 2007. Thereafter, a fresh tender was issued in 2009.

No new howitzer has been acquired for the Indian Army after the controversial acquisition of 410 155 mm (39 calibre) guns in 1986 from Sweden's Bofors. The company since then had multiple changes in ownership, and is now part of British Aerospace Land Systems. It's again in contention with the FH-77 B05. It was reported that this gun had consistently outperformed the competition in the five rounds of trials between 2002 and 2007.

Artillery acquisition is central to the Army's modernisation plans. This tender involves outright purchase of 400 towed guns and transfer of technology for the manufacture of another 1,180 in India.

India is also in the market for 145 ultra-light howitzers for the Army's mountain divisions. There's also a long-pending requirement of wheeled and tracked self-propelled artillery, which too has gone through extensive acquisition processes which subsequently came to naught. •



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Northrop Grumman Wins Brunei Contract

Northrop Grumman has been awarded the contract by the Ministry of Defence of Brunei Darussalam to provide a Joint Operations Centre command and control capability for the Royal Brunei Armed Forces (RBAF). The contract, which will be undertaken by Northrop Grumman UK, will include the supply of an integrated Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) headquarters system and a deployable Joint Operations Centre (JOC) together with the provision of training and in-country support.

A total of 14 potential vendors from around the world participated in the competition. This award follows the completion of a rigorous phase of system assessment in which Northrop Grumman successfully demonstrated the capabilities of its technical solution.

"We are delighted to have been selected to provide this important enhancement to Brunei's defence capabilities. It will not only help improve national security and the protection of its natural resources but also will allow the Royal Brunei Armed Forces (RBAF) to be a lead nation in regional and coalition activities," said Paul Davison, director Defence Systems Europe for Northrop Grumman's Information Systems sector.

The core solution for the Brunei JOC will be Northrop Grumman's Inter-



THE JOC WILL PROVIDE THE RBAF WITH A FACILITY THAT WILL DELIVER COMMAND AND CONTROL CAPABILITY FOR MILITARY COMMANDS AND CIVIL ORGANISATIONS AT BOTH NATIONAL AND INTERNATIONAL LEVEL, AND WILL BE INTEROPERABLE WITH ITS NATO AND ASEAN ALLIES AND COALITION PARTNERS

national-Joint Operational Command and Control System, which incorporates the company's industry leading software applications Command and Control for the PC (C2PC) and Interoperable C4I Services (ICS). These are currently deployed in more than 40 countries with 100,000 users, making them among the most successful and widely used applications for strategic command and control systems worldwide.

Together, C2PC and ICS provide a seamless top-to-bottom architecture for command and control, from the strategic and

operational levels down to the dismounted soldier.

Northrop Grumman in the UK is delivering similar systems to other customers worldwide. C2PC and ICS currently provide the user interface and core functionality for many operational command systems around the world, including NATO's Maritime Command & Control System, the UK MoD's Joint Operations Command System and Royal Navy Command Support System. ICS is also the core application for both the US' joint and maritime Global Command and Control Systems and continues to be at the heart of the UK's next generation of joint command and control support programme. •

P-8I moves FORWARD

By Leland Wight

A little over a year ago, Boeing signed a contract with the government of India to provide eight P-8I long-range maritime reconnaissance and anti-submarine warfare aircraft to the Indian Navy. Boeing will deliver the first P-8I within 48 months of the initial signing and the remaining seven by 2015.

The Boeing P-8I programme is on schedule at the end of its first contract year. In August, the government of India and the US government signed a technical assistance agreement that allowed the program to move forward with the necessary technical discussions required to execute the programme. In October 2009, the programme completed a successful Preliminary Design Review.

We expect 2010 to be a very productive and exciting year for the team. Among other milestones, we will begin assembling the first P-8I aircraft later this year.

The \$2.1 billion (Rs 9,75 crore) contract, signed after a global tender, requires an offset commitment which will drive investments and transfer technology back into India. Boeing recently signed contracts with three Indian public-sector companies and one private-sector firm to source avionics and electronic equipment. Purchase contracts have been released to the Electronics Corp. of India Ltd. (ECIL), HAL Avionics Division, Bharat Electronics Ltd.

(BEL) and Avantel Softech Ltd.

Additionally, we have made source selections on three additional aircraft systems. Contracts for those systems will be solidified in the coming months. Equipment and software from the Indian suppliers will be delivered to Seattle for incorporation into the P-8I.

The P8-I is based on the militarised Boeing 737-800 aircraft being developed for the US Navy's P-8A programme. It is the latest example of Boeing's ability to develop military derivative products based on its commercial jetliner designs. Boeing Defense, Space & Security and Boeing Commercial Airplanes employees are working together under a joint management team on P-8I.

The P-8I team has integrated Raytheon's advanced AN/APY-10 synthetic aperture radar for tracking ships, submarines and small coastal vessels; Northrop Grumman's electronic warfare self-protection suite and electronic surveillance measures systems; BAE Systems' countermeasures dispenser system; GE Aerospace's flight and stores/weapons management system, and GE-SAFRAN's powerful CFM 56-7 engines.

The aircraft provides capability for nine crewmembers and operators, including stations for the pilot and co-pilot and five operator workstations.

The P-8I will offer India tremendous capability advances over legacy systems. Designed specifically to counter threats from enemy submarines in littoral and deep-water operations, the P-8I also will be a formidable deterrent to surface and over-land attacks.

Its exceptional range makes P-8I ideally suited to patrolling the vast Indian coastlines and busy shipping lanes. Couple this capability with the reliability of the Next-Generation 737 commercial airframe, and the P-8I stands out as the clear leader in any major naval modernisation

and capability-enhancement programme.

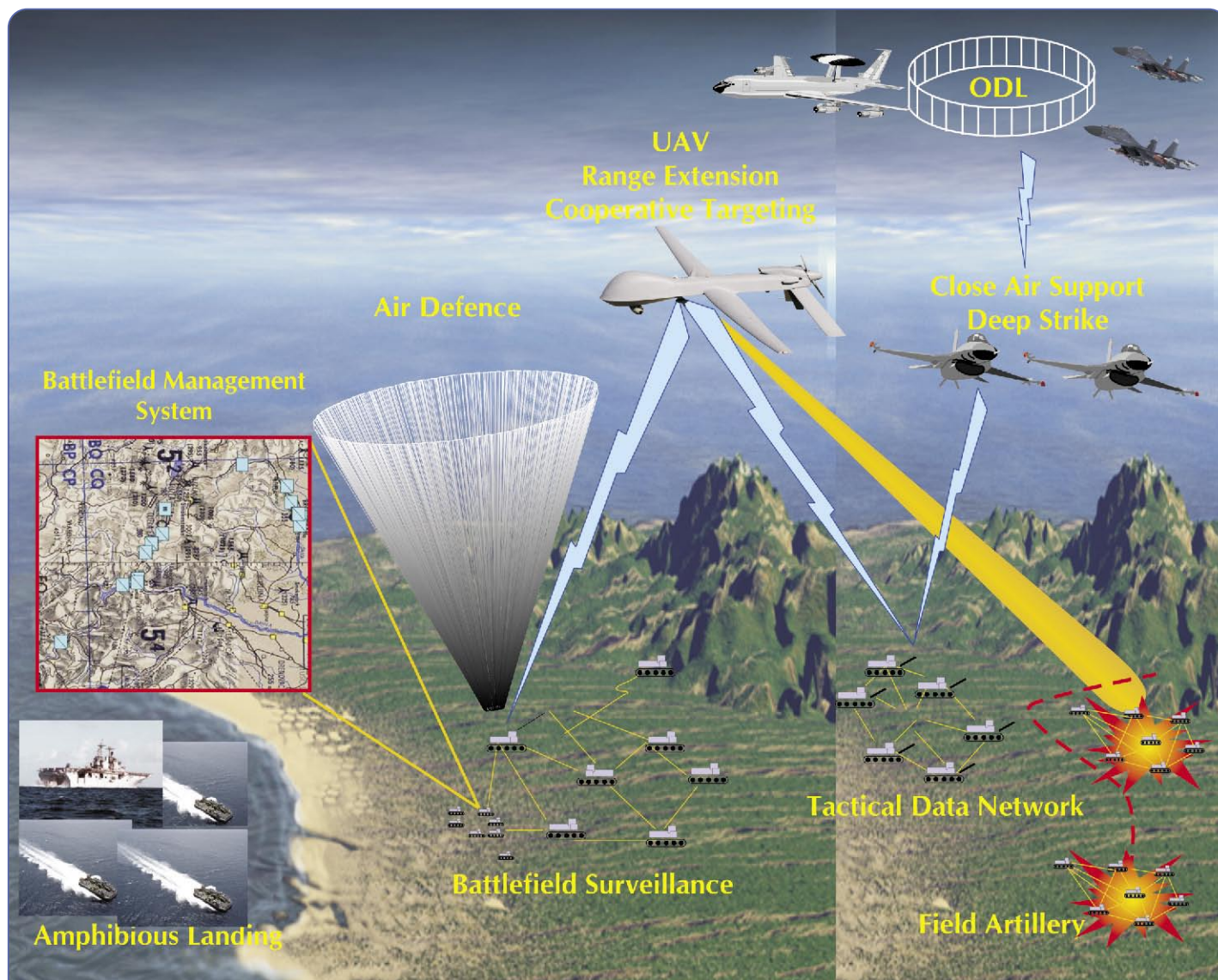
The P-8I's range of 1,200 nautical miles and ability to remain on-station for four hours make it an excellent fit for the Indian Navy's mission. Factor in an optional aerial refueling capability, and the P-8I is the ultimate vehicle for achieving maritime domain awareness. Boeing has offered the Indian navy a Universal Air Refueling Receptacle Slipway Installation, which can accommodate an air refueling boom similar to those used on the KC-135 and KC-10.

Boeing is supplying a fully integrated military aircraft, based on the highly reliable 737-800 platform. Weapons and stores, such as the Boeing-built Harpoon Block II missile, are part of the agreement, to be acquired through the US government under its Foreign Military Sales programme.

India is the first international customer for this sophisticated technology based on the P-8A system. There are provisions for future technology upgrades that can easily be inserted due to the aircraft's open architecture. The use of commercial off-the-shelf software provides more opportunities for incorporation of indigenous systems and facilitates future upgrades. This means that the Indian navy will remain on the cutting edge of maritime patrol technology well for decades to come.

The P-8I will provide all the necessary range, speed, and payload to deter future threats to India's security while fulfilling the Indian navy's requirement for complete maritime domain awareness. Boeing and its team look forward to continuing our working-together relationship with the Indian navy in 2010 and building what ultimately will be an immensely capable system.

Leland Wight is the P-8I Programme Manager, Boeing



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General Dynamics UK offers hi-tech small businesses the EDGE™

Small hi-tech companies are the lifeblood of innovation all around the world, but face similar problems wherever they are. Lack of funding, access to testing and proving laboratories, and the opportunity to have their product taken seriously by industry are major stumbling blocks that many small and medium enterprises (SME) never overcome.

As a prime systems integrator, General Dynamics UK Limited understands the value of collaboration and also how some of today's leading technologies may never have seen the light of day without some help from a stronger, bigger partner.

This is why General Dynamics launched a series of pioneering innovation centres in the USA and UK for knowledge-based industries.

In the UK this enables rapid testing of new advances in technology by the UK Ministry of Defence, Britain's leading universities, and high-tech small and medium size enterprises (SMEs). It is a business model that can be replicated anywhere in the world, and indeed the EDGE™ UK is the second one of these facilities in the world following the opening of the original EDGE™ in the USA.

The EDGE™ provides a collaborative environment for new equipment and software to be joined to existing defence communications and IT systems, facilitating speedy assessment and refinement of emerging capabilities for the armed forces and security services. It is a revolutionary model where industry and academia collaborate to deliver new technologies and in-

novative capabilities to users worldwide.

As well as helping innovative SMEs bring new capabilities to market, the EDGE™ UK facility has developed the partnership-based concept of the UK's unique Joint Systems and Joint Networks Integration Bodies (JSIB and JNIB). The Joint Integration Bodies, pioneered by General Dynamics UK and the MoD in delivering the UK's flagship C4I communications programme, bring together industry and the MoD to integrate key networks and systems into a coherent whole.

EDGE™ allows best-of-breed science and technology innovations to be rapidly turned into fielded capability, providing customers with a competitive edge.

For more information visit General Dynamics UK on Stand 14.28, Hall 14 of DefExpo 2010. •

Eurofighter Typhoon Targets 300 more orders in the next 20 years

The Eurofighter consortium foresees substantial growth opportunities in the world market, with India playing a crucial role. "We evaluate the global demand for combat aircraft in the next 20 years at around 800 units. For Eurofighter Typhoon we target 300 additional export contracts, with Asia representing a substantial part of these orders," says Enzo Casolini, CEO of Eurofighter GmbH, adding, "Given the developments already planned and the further upgrades we are studying, Eurofighter Typhoon will remain the most modern combat aircraft available in the global market for a long time."

Bernhard Gerwert, Chairman of the Supervisory Board of Eurofighter GmbH and CEO of Military Air Systems, a Business Unit of EADS Defence & Security (DS), underlines, "We are well positioned in the ongoing tender for the acquisition of 126 Medium Multi-Role Combat Aircraft (MMRCA) because the Eurofighter Typhoon is the ideal answer to the threats that India faces. The aircraft's outstanding operational performance coupled with low life-cycle costs and a tailor-made industrial partnership offer makes the Eurofighter Typhoon a key contender in India's competition."

More than 700 orders and over 200 deliveries to the four European core customers as well as to Austria and Saudi Arabia prove that Eurofighter Typhoon is a mature international weapons programme. The signature of the Tranche 3 A contract by Germany, the United Kingdom, Italy and Spain in July 2009 reiterated the strong commitment of its core customers. "This milestone secures production continuity for years to come, and forthcoming upgrades will further enhance the aircrafts' operational performance", says Gerwert. "Now we are keen to phase India into the Eurofighter programme as a true industrial partner. By co-developing cutting edge future capabilities with us, India could play a key role in tapping the plane's tremendous built-in growth potential. As a production and development partner for future enhancements, India could also customise the Eurofighter Typhoon to its specific requirements."

In addition to supporting the growth of India's indigenous defence industry, the four Eurofighter Typhoon partner companies and their 400



suppliers will give India access to an international sourcing network of unparalleled scope.

They are confident to meet the 50 per cent offset obligation of the Request for Proposal (RFP).

On behalf of the Eurofighter consortium, EADS Defence & Security submitted the Eurofighter Typhoon bid and a comprehensive offset offer to the Indian authorities, in 2008. Since then, 25 Memorandum of Understandings were signed to enhance the industrial cooperation with India's aerospace and defence industry.

Military Air Systems is an integrated Business Unit of EADS Defence & Security (DS). With revenues of € 5.7 billion in 2008, DS is a systems solutions provider for armed forces and civil security worldwide. Its portfolio comprises sensors and secure networks, missiles and aircraft, UAVs as well as global security, service and support solutions. EADS is a global leader in aerospace, defence and related services. In 2008, EADS generated revenues of €43.3 billion and employed a workforce of about 118,000.

Eurofighter Typhoon is the most advanced multi-role/swing-role combat aircraft available globally. With 707 aircraft under contract, it is Europe's largest military programme. The programme delivers cutting-edge technology, strengthens Europe's aerospace industry and secures more than 100,000 jobs in 400 companies. Eurofighter Jagdflugzeug GmbH manages the programme on behalf of Partner Companies Alenia Aeronautica / Finmeccanica, BAE Systems and EADS. Europe's four leading aerospace companies have a combined turnover of approximately €88 billion (2008). •

French Defense Ministry orders two Eurocopter EC225s



The two EC225s ordered by the French Armament Procurement Agency (DGA) will be the first to be operated by the French Navy. The helicopters, which will be used to perform search and rescue (SAR) missions off the coast of Brittany, are slated for delivery in the first half of 2010 and will be assigned to the Lanvéoc naval air station in the Finistère region. They will replace the navy's Super-Frelon helicopters and will be operated until such time as the first NH90 NFH helicopters enter service at the base in late 2011.

"We are extremely pleased that the DGA continues to place its confidence in Eurocopter products," declared Eurocopter CEO Lutz Bertling. "The EC225 has been selected in nearly every tender in which it was a candidate. This helicopter has quickly become the reference for sea SAR missions around the world," he added.

The EC225 was designed from the outset with SAR missions in mind. The twin-engine helicopter has an entirely redesigned five-blade rotor system and a maximum takeoff weight of 11 metric tons. Amongst its many possible mission scenarios, the EC225 is capable of rescuing ten people within a range of 300 NM. •

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Santel Group is India's largest integrated manufacturer of a wide range of displays for television, avionics, industrial, medical and professional applications, TV glass, components for displays, machinery and engineering services. The group employs 5000 people in nine world-class factories and has an annual turnover of Rs 12 billion (USD 300M).

Santel is a key Indian player in high-technology products for avionics and military applications in both domestic and international markets. Santel straddles the entire value chain from design, development, manufacture, testing, qualification, repair & maintenance and obsolescence management of avionics products and Display Systems for Military as well as Marine Applications. Its products include Color Avionics Tube (CAT), Multi Function Displays (MFD), Head Up Displays (HUD), Helmet Mounted Displays (HMD), Automated Test Equipments (ATE), Ruggedised LCDs for Navy and Smart Multifunction Displays. Santel also has a joint venture with Hindustan Aeronautics Limited (HAL) - Santel HAL Display Systems, which was created in 2006 to address the avionics requirements of HAL, especially cockpit displays of all kinds.

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DEFEXPO '10

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Continued from page 1

put a 15-year 'Technology Perspective and Capability Roadmap' on the web to indicate to the market the requirements of India's armed forces.

Industry acquainted itself with the changing rules of the game, and the armed forces got a glimpse of the latest technology enablers for war fighting.

Defexpo sets the stage for a number of industry developments. One was the emergence of India as an outsourcing hub for major helicopter manufacturers. **AgustaWestland** declared a JV with **Tata Sons** to shift the final assembly line of the AW-119 helicopter to Hyderabad for sales worldwide.

Another helicopter dada, **Sikorsky** too announced a tie-up with **Tatas** for the manufacture of up to 36 air frames for its showpiece VVIP helicopter, the S-92, which is used to fly nine heads of state around the world. The airframes will also be made at Tata's Hyderabad facility.

Sikorsky went on to promise shifting the production line of the iconic Black Hawk to India, should it decide to buy this helicopter. The company expects additional sales of at least 2,000 of these aircraft around the world. More business is being generated in this category by the impending lease of 16 surveillance helicopters to the Indian Coast Guard.

Defexpo 2010 happened against the back-



drop of the selection process in two mega Army tenders: those for 1,580 towed artillery guns and 197 utility helicopters, giving a glimpse of the mega bucks in the Indian market.

The evolving partnership between **BAE Systems** and **Mahindra & Mahindra** looked like a trend-setter in building a defence industrial base in India. The partners unveiled Mine Protected Vehicles, and provided an indication of teaming up in the artillery segment, giving an Indian face to international products.

Raytheon tied up with **L&T** to give night

sights for T-72 tanks. **SAAB** partnered **Samtel** for cockpit head-up displays. IT giant **Wipro** and **CAE** announced a pact in the growing simulator-based training business. **Ashok Leyland** declared an entry into the armoured vehicles market.

Thales launched the Vigile LW naval Radar Electronic Support Measures (RESM) system to beef-up coastal security to address growing concerns to thwart terror from the seas.

Generals and industry leaders put their heads together at seminars to discuss future requirements of the armed forces. Government and industry talked of ways of making offsets workable.

All this happened under a **hawk-like security vigil**. New measures were introduced to tighten access control through Radio-Frequency IDs (RFIDs). Access was restricted to business visitors on the first three days, enabling better quality interaction for exhibitors from across the world. **Army Bomb Disposal Squad** and **Medical Emergency Teams** were at hand to handle the unforeseen.

The curtains come down on the 6th Defexpo today. The next edition will take place from February 9 to 12, 2012. By then, the first couple of C-130Js would have been delivered to the IAF. The order for the AWACS would have also been completed. And hopefully, India would have made up its mind on the MMCA fighter. The market would be looking towards new horizons, perhaps. •

—With inputs from
Sucheta Das Mohapatra



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The innovative, twin-engine DA42 MPP (Multi-Purpose Platform) is a specially designed platform for carrying multi-functional aerial sensor equipment. It combines the advantage of extremely low operating costs with the specialized requirements of sensor operators. The investment in a multi-purpose platform pays for itself through the fuel savings alone.

The fully equipped DA42 MPP can operate in all weather conditions and at a wide range of speeds, from a minimum of 75 kts to a maximum of 152 kts (IAS). In monitoring mode the aircraft can fly for up to 12,5 hours without refueling. The maximum range at 50% power setting is more than 1350 nm. No other aircraft can match the flexibility of the DA42 MPP.

The DA42 MPP was specifically developed to carry the following mission equipment:

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'Airborne Battle Management' by Boeing

By Ruchika Chawla

Boeing, under its Defense, Space & Security division, held an informative and appropriate press briefing on 'Battle Management' during Day 3 of Defexpo 2010, focusing on Airborne Battle Management and the facilities available to gain from its range of products.

Tim Nogart, Director of Airborne Battle Management, gave a brief on the Airborne Early Warning and Control (AEW&C) EW&C for the 737. A state-of-the-art system providing airborne surveillance, communications and battle management, the AEW&C carries the Multi-role Electronically Scanned Array (MESA) radar. The MESA is able to track airborne and maritime targets simultaneously and help the mission crew direct the control of the

fighter aircraft while continuously scanning the operational area.

The other highlight of the briefing was the eight P-8Is ordered by the Indian Navy. The P-8I is a variant of the P-8A Poseidon that Boeing is developing for the US Navy. Having signed the first international contract for the P-8 with the Indian navy, Boeing will deliver the first P-8I within 48 months of contract signing, and the remaining seven by 2015.

"We received a level of release to meet 100% of the Indian Navy's requirement," expressed Nogart. The P-8I is a long-range anti-submarine warfare, anti-surface warfare, intelligence, surveillance and reconnaissance aircraft capable of broad-area, maritime and littoral operations. •

General Dynamics UK introduces rapid 3D mapping of urban environment

General Dynamics UK Limited introduces rapid 3D mapping of the urban environment to the world of security.

In addition to cutting-edge physical security solutions and interoperability of communications, good intelligence is the lifeblood of security services worldwide. But gathering and collating intelligence can take time, and in heightened threat situations time is not a luxury that security operatives have. In addition, the information that is gathered needs to be presented in an easily understandable format so that the response can be more effective.

In short, intelligence needs to be as fresh as possible and easily understood.

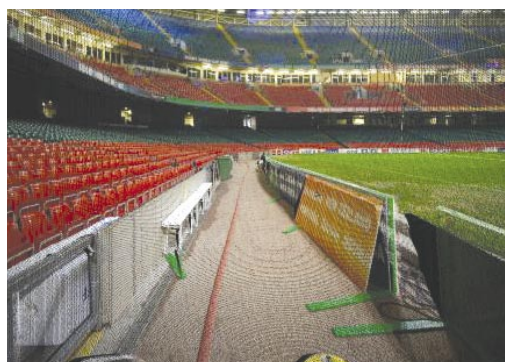
This is where General Dynamics UK's approach to Intelligence, Surveillance, Targeting and Recognition (ISTAR) systems, and its new technology VESPer (Virtual Extra Sensory Perception) can give security forces a real edge.

VESPer helps to increase organisations' safety and effectiveness in a wide range of scenarios, both planned (such as helping to develop permanent security facilities) and ad-hoc (for example, responding to a terrorist incident).

It collects huge amounts of data and very quickly fuses and compresses it down to a manageable size that is more easily communicated and shared up and down the chain of command. This speeds the delivery of a useful picture to the decision makers who need it.

To do this VESPer uses a set of sensors mounted on a ground vehicle or aircraft to build an accurate geo-referenced 3D map of an area. This might be a single building (such as a stadium), or an entire city area. Simply by driving through or flying over the area, a highly accurate 3D map of everything in range of the sensors can be generated. It is also possible to take a dismounted system, using rotating sensors, inside a building for example.

VESPer's 3D map is compatible with other



Rapid generation of the 3D map enables the captured data to be used almost immediately, and the map itself can be 'walked through', similar to the virtual reality experienced when 'walking' through a scene in a computer game. For example, having the ability to compare scans of a building before and after it has been taken by terrorists, means that forces preparing to engage in a scenario can see the differences on the outside and understand what to expect inside and rehearse their response. Knowing where combatants and non-combatants are likely to be located, for example, will hopefully cut down on innocent bystanders or hostages being injured, or worse, killed.

geospatial systems – every dot in the image is effectively a reference point. So you can take measurements or overlay data and other sensor-derived geo-referenced data such as cell phone locations, or information feeds showing the locations of police or Special Forces units.

Once VESPer has generated a 3D map, you can interact with it and exploit the intelligence gained in many ways. Uses and activities include:

Terrorist siege situations

In a siege situation, forces can use VESPer's through-the-wall sensor capabilities to analyse building structure, identify where the enemy is and decide which routes to take into the held area.

Public event security

Police working on security for a forthcoming public event at, for example, a sports stadium could use the 3D map to plan safe ingress routes for key personnel in the event of an incident. The 3D map can also be used for evacuation planning and virtual run-throughs to test the effectiveness of plans.

Urban emergency planning

When planning for a flood, a large scale 3D map of a town can be created to allow the impact of various scenarios to be tested, such as which areas will be damaged as water rises to different levels, so plans can be made to minimise the impact.

VESPer sensors

VESPer uses a variety of sensors, according to the situation and needs of the user. The system typically includes:

- **LIDAR** – Light Intensity Direction and Ranging.
- **Visible imaging**
- **Thermal imaging**
- **3D through-the-wall radar** – builds up a picture of a building's structure, and detect objects inside.
- **X-ray backscatter** – detects hidden objects, such as explosives inside vehicles.

For more information visit General Dynamics UK on Stand 14.28, Hall 14 of DefExpo 2010. •

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