As GIS Gets Integrated Into Geospatial,

Transforms Into All Encompassing

www.geospatialworld.net
HARNESSING TECH FOR OPTIMUM SECURITY

Homeland security needs to keep pace with the increasing technological prowess of sources of threats. The adoption of C4ISR, which makes extensive use of geospatial technologies, provides security forces the wherewithal to do so.

ARTICLES

Deciphering Intelligence 28
Militaries throughout the world are drowning in intelligence data. The challenge for them is no longer to collect data but to retrieve and analyse it to make it actionable.

PREVIEW

One stop shop 32
DGI 2011 is all set to become one of the largest gatherings for the world’s geospatial intelligence community

EVENT REPORTS

Building 'GEOINT 3.0' 36
GEOINT Symposium 2010 registered the highest participation to date

Information is the new weapon 40
Industry and armed forces came together at Defcom India 2010 to discuss the future of net-centricity in Indian Defence

ARTICLES

Deciphering Intelligence 28
Militaries throughout the world are drowning in intelligence data. The challenge for them is no longer to collect data but to retrieve and analyse it to make it actionable.

GIS Development Pvt Ltd
A-145, Sector 63, Noida, India
Tel +91 120 4612500 Fax +91 120 4612555/666

GIS Development does not necessarily subscribe to the views expressed in the publication. All views expressed in this issue are those of the contributors. The publication is not responsible for any loss to anyone due to the information provided.
Rolta has signed a partnership agreement with Augusta Systems, Inc., a provider of technologies that power the convergence of devices, systems and networks. Through the partnership, Rolta will be able to incorporate Augusta EdgeFrontier middleware for use in security, defence and other geospatial applications where sensor integration and fusion are essential elements in providing situational awareness. EdgeFrontier is field-proven, and has been successfully deployed by government organisations with security mandates, such as the US Department of Defense, the company said.

“Security and defence agencies have found EdgeFrontier to be the ideal platform for building and managing applications featuring data and control functions from diverse devices and systems,” said Patrick Esposito, President and Chief Executive Officer of Augusta Systems. “These EdgeFrontier capabilities, coupled with Rolta’s market knowledge and technical solutions are uniquely positioned to help agencies around the world protect critical infrastructure and save human lives.”

“Real-time sensor information management is a major challenge in providing robust situational awareness during both normal operations and crisis periods, when the amount of raw sensor data can become overwhelming. EdgeFrontier enhances Rolta’s capability to rapidly build flexible, configurable systems to intelligently process, integrate and control sensor networks,” said John Halsema, Rolta Senior Vice President Public Safety and Homeland Security Solutions.
Saab’s coastal surveillance system in India

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

The order comprises sensors to be installed along the Indian coast and equipment for regional and national control centers. Users of the system, apart from DGLLL, will be the Indian Navy, Coast Guard and DG Shipping.

Saab together with its Indian partner, Elcome Marine Services, will implement the project which includes installation, commissioning, training and support.

The project starts immediately and will be completed within 18 months.

“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 Defence Solutions.

Rafael introduces ImiLite ISR Exploitation System

Rafael Advanced Defense Systems Ltd. recently unveiled its multi-sensor, multi-platform intelligence, surveillance and reconnaissance (ISR) Exploitation System, Imilite.

ImiLite is a cost-effective intelligence system designed to receive, process and exploit multiple standalone imagery video and other intelligence data in a centralised and a unified way. Main system capability includes the reception, processing and exploitation of EO, IR, SAR/GMTI and VIDEO, in various formats, over one desktop. In order to enhance the exploitation process, ImiLite further combines non-imagery data such as targets, threats, COMINT detection and mission status within the system workflow. ImiLite generates a variety of standard and customer tailored ISR reports and IMINT products such as alphanumeric reports, annotated maps, GIS data layers and visual aids, and disseminates them to external information and operation systems over standard and tailored protocols.

Haim Jacobovitz, Corporate VP and General Manager of Network-Centric Warfare Sector at Rafael, said, “ImiLite’s advanced ISR exploitation capabilities provide defence and police forces a leading edge in dealing with today’s intelligence collection and processing demands.”

ImiLite joins Rafael’s battle-proven C4ISR solutions to complement its vast variety of other advanced defence systems in use by dozens of customers around the world.”
GeoDecisions opens office in Scott Air Force base

GeoDecisions, an information technology company specialising in geospatial solutions, recently added a new satellite office in Scott Air Force Base, Ill.

For the past six years, GeoDecisions has provided on-site support to the US Military Surface Deployment and Distribution Command (SDDC) and the US Transportation Command (USTRANSCOM), which are both located at the base.

GeoDecisions supports SDDC’s and USTRANSCOM’s use of its patented IRRIS® technology, a geospatial Web application used to track, manage, and document the movement of surface cargo transported throughout the world, as well as enterprise geographic information systems (GIS) for the Command.

Northrop Grumman delivers Global Hawk sensor

Northrop Grumman Corporation delivered the first production Multi-Platform Radar Technology Insertion Program (MP-RTIP) sensor to Edwards Air Force Base for integration on the first US Air Force Block 40 Global Hawk.

The first MP-RTIP Global Hawk flight is scheduled to occur by early 2011. MP-RTIP’s unique application of advanced technologies can detect multiple stopped, slow and fast-moving objects on the ground in any weather, day or night.

This capability combined with the endurance of the Block 40 Global Hawk provides the warfighter with more than 30 hours of greatly improved situational awareness and combat identification per mission, said the company.

Northrop Grumman Aerospace Systems is the prime contractor for the Global Hawk and MP-RTIP programmes; and is teamed with Raytheon Space and Airborne Systems to develop, produce and deliver the radar.

Upgrading sensors for target location

Raytheon is upgrading sensors with enhanced target location accuracy and high-definition imaging. “This is an important upgrade for our Multi-Spectral Targeting Systems (MTS) family of sensors as we continue to provide high-performance, state-of-the-art technology for the warfighter,” said Tim Carey, Vice President for Intelligence, Surveillance and Reconnaissance Systems. “Target location accuracy will allow soldiers to accurately assess threats and effectively engage targets.”

With this enhanced target location accuracy and high-definition upgraded technology, MTS will provide more accurate targeting, said the company. Raytheon Multi-Spectral Targeting Systems deliver superior ISR and pinpoint targeting capability as a cost effective solution.

Raytheon is upgrading sensors with enhanced target location accuracy and high-definition imaging. “This is an important upgrade for our Multi-Spectral Targeting Systems (MTS) family of sensors as we continue to provide high-performance, state-of-the-art technology for the warfighter,” said Tim Carey, Vice President for Intelligence, Surveillance and Reconnaissance Systems. “Target location accuracy will allow soldiers to accurately assess threats and effectively engage targets.”

With this enhanced target location accuracy and high-definition upgraded technology, MTS will provide more accurate targeting, said the company. Raytheon Multi-Spectral Targeting Systems deliver superior ISR and pinpoint targeting capability as a cost effective solution.
**SAIC unveils new motion imagery exploitation system**

A new motion imagery exploitation system was unveiled by Science Applications International Corp. (SAIC). The system enables intelligence analysts to fuse, exploit and report on motion imagery data from a full range of sources.

The Advanced Intelligence Multimedia Exploitation Suite (AIMES) is a new product release in the SAIC Advanced Analytics Application line of tools, which are designed to support the geospatial visualisation and fusion of motion imagery data with other geospatial and spatial data sources.

AIMES helps break down single-source stovepipes to enable near real-time and forensic fusion of full motion video (FMV), all-source intelligence information as well as synchronised visualisation of raw data, chat and processed intelligence.

It offers an open architecture that can adapt to the evolving needs of the FMV and geospatial intelligence communities. Its open architecture features the ability to rapidly integrate third party tools, algorithms and services through the use of cloud technologies. This enables the retention of a consistent FMV infrastructure, while keeping pace with the new technologies.

**Raytheon awarded USD240 million for Aegis production**

The US Navy awarded Raytheon company USD240 million for production and delivery of critical components of the Aegis weapons system for the Arleigh Burke class of destroyers. Under the contract, Raytheon Integrated Defense Systems (IDS) will provide production, engineering and support services for four ship sets of the AN/SPY-1D(V) transmitter group and MK99 Mod 8 Fire Control System. The radar and fire control system equipment is essential to the Aegis weapon system’s ability to track and defend against multiple threats, including planes and missiles. Raytheon’s AN/SPY-1 radar transmitters and MK99 Fire Control System have been in continual production for 30 years as part of the US Navy’s Aegis shipbuilding programme. The AN/SPY-1 and the MK99 are currently installed in the US Navy’s fleet of Ticonderoga-class cruisers and Arleigh Burke-class destroyers, as well as in Japanese Kongo-class destroyers and Spanish F100-class frigates.

**Lockheed Martin develops vehicle-mounted tablet**

Lockheed Martin has developed a ruggedised tablet computer for use in tactical vehicles. The TacFleet 8 allows real-world tactical situational awareness exchanges for brigade-and-below forces on the move.

TacFleet 8 provides superior tactical communications capabilities while meeting ultra-ruggedised military standards for harsh environments in combat and civil operations. The tablet will be mounted into a lightweight and compact dock, and is compatible with current US Army Force XXI Battle Command Brigade-and-Below (FBCB2) systems. It allows users to exchange messages with other terrestrial and airborne units, as well as utilise sophisticated mapping tools. The TacFleet 8 meets all Joint Battle Command-Platform and FBCB2 requirements.

TacFleet 8 users can also wirelessly control and stream imagery from ground vehicles and fixed- and rotary-wing aircraft sensors.
BAE bags USD 38 million contracts for thermal imagers

BAE Systems has received multiple contracts totaling USD38 million to provide thermal imagers for the US Army’s Common Remotely Operated Weapon Station (CROWS) II and Stryker programmes.

The TIM1500™ thermal imagers used on remote weapon stations allow soldiers to detect and identify enemy targets while remaining protected inside their vehicles through remotely controlled, vehicle-mounted platforms for light- and medium-caliber weapons. The TIM1500 provides extended viewing range capability to detect vehicle targets at a significant range for target acquisition, long-range surveillance and situational awareness.

"The TIM1500 provides high performance imaging while offering a smaller, lighter, lower power and lower life-cycle cost compared with other competitive options," said Michael Mawn, Product Line Manager for TIM1500.

Under the contract, BAE Systems from its Lexington, Massachusetts operations, will provide the TIM1500 to Kongsberg Defence and Aerospace AS. The company recently shipped its 10,000th TIM1500 imager, and increased its production rate in support of Army requirements, including deployment of the units on MRAP combat vehicles.
Boeing recently announced its new Surveillance Detection System (SDS) capable of near real-time, 360-degree detection of optical threats. The system identifies when friendly forces are being monitored or targeted by cameras, binoculars, sniper scopes or other optical means.

It provides the range and GPS position of detected threats in a prioritised database built on real-time target interrogations to greatly increase situational awareness and identification.

The SDS can be adapted to meet specific customer needs, including tracking of counter-surveillance; snipers; intelligence, surveillance and reconnaissance; and improvised explosive devices.

“Combining Boeing’s advanced pointing and tracking solutions and real-time processing with our rapid-prototyping experience, this system is able to provide warfighters with the tactical advantage they need in hostile environments,” said Mike Rinn, Vice President of Boeing Directed Energy Systems.

The SDS design combines advanced sensing and processing components in a compact, lightweight and environmentally rugged package.
BAE Systems helps modernise NGA’s applications

BAE Systems recently transferred a server-based mission application into a virtualised data-centre environment to increase reliability and reduce operating costs, completing the first task order under the National Geospatial-Intelligence Agency’s (NGA) Total Application Services for Enterprise Requirements (TASER) contract. BAE Systems transferred a server-based mission application into a virtualised data-centre environment to increase reliability and reduce operating costs, completing the first task order under the National Geospatial-Intelligence Agency’s (NGA) Total Application Services for Enterprise Requirements (TASER) contract.

Raytheon to upgrade CDU of F-16 aircraft

Raytheon has won a contract to upgrade the Center Display Unit (CDU) of US Air Force Reserve and Air National Guard F-16 aircraft. The initial contract value is USD3.1 million for system integration and pre-production units. The contract includes options for production of up to 120 systems per year for five years.

The Raytheon CDU will replace multiple analog flight instrument displays currently used in the F-16 cockpit with a single large-LCD colour display. Advanced technology will provide pilots with new capabilities, including the ability to overlay data from both onboard and remote sensors on a digital moving map, video processing, and two-way data-link situational awareness messaging, said the company.

Raytheon Technical Services Company LLC (RTSC) will perform engineering and low rate initial production on the system at its site in Indianapolis under the initial contract. The contract includes five optional years of full rate production.

Under TASER, NGA will similarly transition other legacy hardware and software systems to an application and infrastructure service provider business model over the next five years, as part of USD1 billion indefinite-delivery/ indefinite-quantity contract in which BAE Systems will compete for task orders. TASER is the primary vehicle for evaluating, integrating and sustaining new applications across the National System for Geospatial-Intelligence, which combines technology, policies, capabilities and the communities necessary to produce geospatial intelligence. Earlier this year, BAE Systems was one of the four contractors awarded all four functional categories of the contract including engineering and trade studies; pilots and prototypes; integration and deployment; and application sustainment. BAE Systems is transforming the geospatial-intelligence tradecraft through the development of innovative geospatial and analytic solutions that support critical national security missions.

New suite to help collect GCPs of hard-to-reach areas

CompassData announced the release of a new game changing resource for the geospatial profession. The RS Suite of Remotely Sensed Ground Control Points (RSGCP) allows for the collection of ground control points in areas of the world that were previously difficult, if not impossible, to map due to access or geopolitical influences.

The RS Suite, empowered by TerraSAR-X technology from Infoterra GmbH, makes mapping points in these sometimes dangerous and unreachable locations possible, and allows for two categories of accuracy: Precision RS-1 (up to one meter accuracy) and Precision RS-2 (up to three meters accuracy).

“As the geospatial industry continues to expand, the need for accurate ground control to enhance imagery and GIS is expanding to every corner of the world to produce maps with consistent accuracy. Terrestrial GCP collection in many areas has been difficult due to logistics, political restrictions and safety,” said Brant Howard, Founder and Chief Executive Officer of CompassData.

Until now, Howard said, getting GCPs in areas like Africa, Asia, Middle East and the Korean peninsula was difficult and expensive.

Raytheon to upgrade CDU of F-16 aircraft

Raytheon has won a contract to upgrade the Center Display Unit (CDU) of US Air Force Reserve and Air National Guard F-16 aircraft. The initial contract value is USD3.1 million for system integration and pre-production units. The contract includes options for production of up to 120 systems per year for five years.

The Raytheon CDU will replace multiple analog flight instrument displays currently used in the F-16 cockpit with a single large-LCD colour display. Advanced technology will provide pilots with new capabilities, including the ability to overlay data from both onboard and remote sensors on a digital moving map, video processing, and two-way data-link situational awareness messaging, said the company.

Raytheon Technical Services Company LLC (RTSC) will perform engineering and low rate initial production on the system at its site in Indianapolis under the initial contract. The contract includes five optional years of full rate production.

Under TASER, NGA will similarly transition other legacy hardware and software systems to an application and infrastructure service provider business model over the next five years, as part of USD1 billion indefinite-delivery/ indefinite-quantity contract in which BAE Systems will compete for task orders. TASER is the primary vehicle for evaluating, integrating and sustaining new applications across the National System for Geospatial-Intelligence, which combines technology, policies, capabilities and the communities necessary to produce geospatial intelligence. Earlier this year, BAE Systems was one of the four contractors awarded all four functional categories of the contract including engineering and trade studies; pilots and prototypes; integration and deployment; and application sustainment. BAE Systems is transforming the geospatial-intelligence tradecraft through the development of innovative geospatial and analytic solutions that support critical national security missions.

New suite to help collect GCPs of hard-to-reach areas

CompassData announced the release of a new game changing resource for the geospatial profession. The RS Suite of Remotely Sensed Ground Control Points (RSGCP) allows for the collection of ground control points in areas of the world that were previously difficult, if not impossible, to map due to access or geopolitical influences.

The RS Suite, empowered by TerraSAR-X technology from Infoterra GmbH, makes mapping points in these sometimes dangerous and unreachable locations possible, and allows for two categories of accuracy: Precision RS-1 (up to one meter accuracy) and Precision RS-2 (up to three meters accuracy).

“As the geospatial industry continues to expand, the need for accurate ground control to enhance imagery and GIS is expanding to every corner of the world to produce maps with consistent accuracy. Terrestrial GCP collection in many areas has been difficult due to logistics, political restrictions and safety,” said Brant Howard, Founder and Chief Executive Officer of CompassData.

Until now, Howard said, getting GCPs in areas like Africa, Asia, Middle East and the Korean peninsula was difficult and expensive.
NVision Solutions Inc., has announced the deployment of its NVTouch Surface Computer to the National Center for Spectator Sports Safety and Security (NCS4), for the training of sports security professionals. Apart from allowing for a better way to visualise training scenarios, it provides a real-time common operating picture for police, fire and medical personnel.

Earlier this year, NVision became a founding partner of NCS4, providing its Real-Time Emergency Action Coordination Technology (REACT), as part of NCS4’s SportEvac tool, to help sports officials train in providing security for sports events worldwide. REACT is NVision’s comprehensive emergency management system designated as a “Qualified Anti-Terrorism Technology (QATT)” under the Department of Homeland Security Safety Act. “The NVTouch Surface Computer is one of the most innovative technologies we’ve seen,” said Socorro Harvey, NVision President. “It draws people into our cutting-edge geospatial applications in a whole new way. This system is already used in the defence, medical, and retail industries in Europe.” NVTouch comprises an off-the-shelf Microsoft Windows ™ computer, coupled with a projection system and infrared sensing technology resulting in a 42-inch interactive touch table which is robust and portable. The technology is unique as it allows for unlimited multiple users and multi-touch ability. The components are durable and can be upgraded, which is also unique to the system.

Harris Corporation has announced the new version of its commercial Full-Motion Video Asset Management Engine (FAME™) that enables analysts to more quickly search and analyse metadata.

The release of the FAME 3.1 solution expands upon previous versions by adding greatly enhanced enterprise-level services, which allow tools to be utilised concurrently across hundreds of systems. New tools include virtualisation, a video exploitation processor (VEP) and a geospatially enabled multiviewer. The FAME 3.1 architecture greatly speeds an organisation’s ability to process metadata by allowing any PC in the system to act as a browser-based client that relies on a FAME server for the processing power, said the company.

The FAME 3.1 system ingests H.264 or MPEG-2 transport streams in digital standard- and high-definition formats, retaining metadata within the stream so that it can be stored in the FAME database for searching/cataloging purposes. The stored information is Motion Imagery Standards Board (MISB)-compliant and includes geospatial and mission-critical information. Geospatial markers within the video are inserted into the database as quickly as they are received, making the data searches accurate to the second/frame.

The FAME 3.1 solution includes a new video exploitation processor, which time-stamps all video, providing a universal reference for annotation, metadata correlation and searching - ensuring the data is encoded according to MISB standards.

The FAME 3.1 geospatially enabled multiviewer provides a mapping context to a data wall, allowing multiple, incoming motion imagery streams to be displayed as an overlay on a common operating picture.
Boeing recently introduced DataMaster 5.0, a software system with full-motion video capability that will enable defense and intelligence community customers to better manage vast amounts of intelligence to meet their missions and counter global threats.

“The goal of DataMaster’s video management and exploitation is to extend the ‘half-life’ of the video. It catalogues and organizes the video to give analysts the full benefit of the information gathered for their intelligence, surveillance and reconnaissance (ISR) missions,” said Dewey Houck, Director of Mission Systems for Boeing Intelligence and Security Systems.

Version 5.0’s full-motion video capability improves how users store, catalog and retrieve video, in addition to imagery, maps and terrain data -- all managed in a single system. DataMaster 5.0 uses open video standards set by the Motion Imagery Standards Board (MISB) to manage video from ISR sensors. MISB was established by the National Geospatial-Intelligence Agency Innovation Directorate to standardize motion imagery, associated metadata, audio and other related systems for use within the Department of Defense and the Intelligence Community.

Northrop Grumman Corporation has been selected to supply an additional 40 STARLite wide area surveillance radars featuring synthetic aperture radar (SAR) and ground moving target indicator (GMTI) capabilities for the US Army’s Extended-Range Multi-Purpose unmanned aerial vehicle (UAV). Under the terms of the contract option, radar deliveries to the Army’s Product Manager Robotic and Unmanned Sensors Program Management Office will begin in March 2011 and conclude in March 2012. STARLite is a small, lightweight radar used for supporting tactical operations. Each STARLite radar features both SAR and GMTI capabilities and comes equipped with a complete software package for interfacing with the US Army systems, enabling easy operator control of the SAR maps and ground moving target detection features on standard army maps.
Boeing receives contract for tactical intelligence aircraft

Boeing has received a two-year engineering and manufacturing development contract for the Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS) from the US Army. EMARSS is a manned, airborne intelligence, surveillance and reconnaissance system. It will provide a persistent capability to detect, locate, classify/identify and track surface targets in nearly all weather conditions, day or night, with a high degree of timeliness and accuracy, according to company.

The initial contract covers the engineering and manufacturing development of four aircraft, with options for two additional aircraft, six low rate initial production aircraft, and interim contractor logistics support. The total performance of the contract, if all options are exercised, is 42 months.

Boeing’s EMARSS will consist of a commercial derivative aircraft, the Hawker Beechcraft King Air 350. The aircraft will be equipped with an electro-optic and infrared full-motion video sensor; a communications intelligence collection system; an aerial precision guidance system; line-of-sight tactical and beyond line-of-sight communications suites; two operator workstations and a self-protection suite.

InPho programme gathers momentum

Raytheon BBN Technologies has been awarded USD 2.1 million in funding by DARPA (the Defense Advanced Research Projects Agency) for two projects under the Information in a Photon, or InPho, programme.

The goal of the two projects is to develop new theory and experimental techniques that enable optical communications and imaging systems to operate at their ultimate limits of information encoding efficiency as permitted by the laws of quantum physics. The first project, PIECOMM (Photon information efficient communications), aims to create techniques that increase the current limits of optical communications technology while approaching the ultimate limits of photon information efficiency.

The second project, FINESSE (Fundamental information capacity of electromagnetism with squeezing and spatial entanglement), aims to determine the theoretical performance limits for imaging technology as determined by the laws of quantum physics. “Conventional imaging techniques use classical light pulses from lasers and detect the resulting reflection from a target or scene,” said Jonathan Habif, Raytheon BBN Technologies senior scientist. “We have set out to define new quantum states of light and subsequent detection methods from which we can obtain far more image information from a lot less light.”

Raytheon BBN Technologies will develop new sources of quantum-entangled light and state-of-the-art optical sensor technologies to demonstrate improvement in the information efficiency of light used for imaging.

Next-generation long-range surveillance radar

Lockheed Martin has successfully completed a capability demonstration in the latest phase of the US Air Force’s development of the next-generation mobile, long-range surveillance and ballistic missile defence radar.

The recent demonstration for the Three-Dimensional Expeditionary Long-Range Radar (3DELRR) was the second and final required under USD 25 million, 20-month technology development contract awarded in May 2009. Lockheed Martin completed an initial demonstration of critical technology elements in March 2010 and an initial preliminary design review in October 2010.

The 3DELRR will serve as the principal long-range, ground-based sensor for detecting, identifying, tracking and reporting aircraft and missiles for the Air Force. The system will replace the Air Force’s AN/TPS-75 air surveillance radar. The Marines are also evaluating the system as a replacement for their AN/TPS-59 ballistic missile defence radar.

The Electronic Systems Center at Hanscom Air Force Base, which is leading the acquisition for 3DELRR, plans to award one contract by early 2012 to complete the 3DELRR technology development and engineering manufacturing development phases.
Raytheon has been awarded USD3.3 million contract modification to develop and install a sensor tracking correlation system that will provide improved intelligence and information sharing to the Joint Interagency Task Force South. Raytheon will provide JIATF South with a track correlation system consisting of a multisensor correlation, intelligence fusion and information-sharing capability as part of the Joint Operations Center modernization project known as JOCC 2010. The original contract, awarded by the Department of Defense’s Counter-Narcoterrorism Program Office, included a base and two options, valued at nearly USD4.8 million.

**Sensor tracking system for improved intelligence**

Northrop Grumman Corporation has been awarded a contract by the UK Ministry of Defence (MoD) to design, develop, integrate, test and support the Mode S upgrade to the Identification Friend or Foe (IFF) Interrogator for the Sentry E-3D Airborne Warning and Control System (AWACS) aircraft based at RAF Waddington. The IFF interrogator is a sophisticated airborne defence system that provides a long-range, rapid early warning and detection capability allowing discrimination between friendly and hostile forces. The Mode S system will enable the aircraft to be used in controlled airspace. The contract modification for Mode S is valued at approximately USD 64 million over three years. Work will be performed under the company’s existing Sentry E-3D Whole Life Support Program (WLSP). Northrop Grumman delivers the WLSP for the Sentry E-3D AWACS fleet and is on contract until 2025.

**UK selects Northrop Grumman for Mode S upgrade**

DGA, the French arms procurement agency, awarded EUR 795 million (approx. USD 1 billion) contract to Astrium for two satellites for the optical space component (CSO) that will replace the current HELIOS 2 military observation satellites. The first satellite is scheduled to enter orbit in December 2016. The contract also includes an option for a third satellite. As prime contractor for the CSO satellites programme, Astrium will provide the agile platform and avionics, and will also be responsible for the integration work, testing and delivery of the satellites to CNES-French space agency. Thales Alenia Space will provide Astrium with the very-high resolution optical instrument. Astrium will be making use of new technology to deliver satellites that are 100 times more powerful than the current generation, all at reduced costs. The company has drawn on the latest technological advances and operational feedback from its entire fleet of reconnaissance satellites to cut costs by 30 per cent over the last decade. The satellite will also carry a Galileo navigator developed by Astrium and the latest generation of Sodern star trackers.

**Astrium bags billion dollar military contract**
Saab receives 3D mapping order for Gripen simulators

Saab has received an order from FMV, the Swedish Defence Material Administration, for the delivery of 3-dimensional (3D) models to the Swedish Gripen simulators. The 3D-models will give the simulators a highly realistic visualisation model, said the company. The 3D-models will be generated by the system Rapid 3D Mapping™ based on aerial images, developed by Saab. “This is an important milestone that proves that 3D-models generated by our new product Rapid 3D Mapping™ can be used with excellent results for visualisation in simulators”, says Ulf Hellberg, Head of Business Development within Saab’s business area Dynamics.

New radar system for patrol vessels

Northrop Grumman Corporation recently announced the introduction of a new family of X-Band Coherent Radar (XBCR) systems designed primarily for offshore patrol vessels (OPV) and other smaller combat ship platforms. The SeaGuard XBCR systems are expected to be available for deliveries in early 2012. The system’s Doppler signal processing enables detection of aircraft and helicopters at ranges of 20 nautical miles over sea or land at altitudes up to 6,000 feet as well as high- and slow-speed surface targets such as rigid-hull inflatables or periscopes. It also provides superior clutter suppression, increasing the probability of detection of small targets under extreme weather conditions.

Cobham launches wireless sensor network node

Cobham recently launched wireless sensor network node (Nugget), which is a fully portable networked, unattended ground sensor with five internal sensors built in. It is ideal for covert surveillance applications such as detection of people entering and exiting a building or asset protection, said the company. The complete system consists of one or more nodes configured as detector nodes and one node configured as a destination node, which connects to a monitoring station.

Each Nugget employs a range of internal sensors which include short range Passive InfraRed (PIR), GPS location receiver, ambient light sensor for detecting changes in illumination, tamper detect and a trip wire/break detector. External devices can be switched on and off manually or autonomously through wireless access provided by the Nugget.
Boomerang Warrior-X selected for field trials

Raytheon BBN Technologies’ Boomerang Warrior-X wearable shooter-detection system has been selected by the United Kingdom Ministry of Defence (MOD) for field trials related to urgent operational requirements. The selection follows an assessment by the MOD’s Defence Science and Technology Laboratory that found Boomerang Warrior-X the most effective system tested. Now, Boomerang Warrior-X will be assessed in theater conditions. “Individual dismounted soldiers are the most vulnerable,” said Mark Sherman, general manager, Boomerang, Raytheon BBN Technologies. “Sending Boomerang Warrior-X to the field will provide U.K. troops with the very best protection available.”

Boomerang Warrior-X is a compact shooter-detection system that is easily integrated into the tactical vests of dismounted troops. Weighing less than 11 ounces, the system delivers an alert through an earpiece and provides details of the shooter location on a matchbox-sized display.

It incorporates the technology used in the vehicle-mounted Boomerang III system. More than 5,000 Boomerang III systems have been deployed in Iraq and Afghanistan.

Saab receives order for weapon-locating system

Saab has received an order worth MSEK 114 for equipment to be used with its weapon locating system ARTHUR.

ARTHUR is a stand alone C-band medium-range weapon-locating system that detects and locates enemy fire. It utilises a passive phased-array antenna technology for optimised battlefield performance. The technology provides the perfect balance between mobility, range, accuracy, ECCM (Electronic counter-countermeasures), operational availability and operational cost, said the company.

The ARTHUR system is used by countries like Czech Republic, Denmark, Greece, Norway, Spain, Sweden and UK. More than 60 ARTHUR units have been sold so far.
Northrop appoints VP for space systems business

Northrop Grumman Corporation has appointed Susan Sloan as Vice President of the Space Systems business area within the company’s Navigation Systems Division.

In her new position, Sloan will be responsible for overall leadership of the division’s inertial measurement unit programmes and products for space applications, including Northrop Grumman’s industry-leading Scalable Space Inertial Reference Unit (Scalable SIRU™), said the company.

Sloan brings over 30 years of experience in high technology product development, production, business operations, programme management, systems engineering, mission assurance and strategic planning to her new role. Prior to joining Northrop Grumman, she held several senior positions, including programme manager for Intelsat (International Telecommunications Satellite Organization) in Cannes, France; division director of Operations and Product Manufacturing, Boeing Satellite Systems; and senior director, Space Systems Operations, and vice president of Mission Assurance, Quality and Programme Leadership, Space and Airborne Systems Division for the Raytheon Company in El Segundo, California. Most recently, she led a start-up aviation business as president and CEO.

Sloan earned a bachelor’s degree in mechanical engineering and a master’s degree in business administration from the University of Southern California.

Brad Hicks joins Lockheed Martin’s MS2 business

Lockheed Martin announced that Brad Hicks has joined its Mission Systems and Sensors (MS2) business as Vice President of radar programmes.

“Brad brings extensive air and missile defense system knowledge and expertise to Lockheed Martin,” said Carl Bannar, vice president of Radar Systems. “His appointment recognizes the importance of leveraging our technology investments across our radar portfolio as we provide our customers with the most reliable, affordable solutions for their mission requirements.”

Hicks joins Lockheed Martin from the Monitor Group where he served as a consultant after retiring from the US Navy in 2009. His last active duty position was as Aegis Ballistic Missile Defense programme director for the Missile Defense Agency. He held several command assignments during his 33-year Navy career including commanding officer of the USS Cape St. George (CG-71). He received his bachelor’s degree in international studies from the University of Louisville and completed the Seminar XXI programme at the Massachusetts Institute of Technology.

Saab Denmark gets new CEO

Heino Lundgren has been appointed as the new CEO for Saab in Denmark from December 1, 2010. He will also continue in his present role as CFO.

Lundgren succeeds Troels Birkedal, who quit Saab after almost four years as CEO for Saab in Denmark.

“During my years with Saab, I’ve come to know the business very well. I’m looking forward to take on this role and develop our position on the market, both in Denmark and worldwide.

“We have an interesting portfolio with good potential, including, for example, mine warfare and communication systems,” said Lundgren.

Lundgren will report to Ulf Campner, Head of the Communication Systems division within the business area Security and Defence Solutions, Saab.

Raytheon appoints new president for network centric systems

Raytheon has appointed Daniel J. Crowley as President of Raytheon Network Centric Systems (NCS), effective November 1, 2010. Crowley succeeds Colin J.R. Schottlaender, NCS president since August 2002, who will retire from Raytheon on December 31, 2010. Crowley will work with Schottlaender during the interim period prior to Schottlaender’s retirement date.

Raytheon Network Centric Systems is headquartered in McKinney, Texas, USA.

“Daniel’s extensive industry background and deep expertise in operations, engineering, strategic business development and global customer engagement are ideally suited to his new role with Raytheon,” said William H. Swanson, Chairman and CEO of Raytheon.

Crowley brings significant experience in the aerospace and defense industry to NCS’ top leadership role, including 27 years with Lockheed Martin Corporation, said the company. He most recently served as chief operating officer of Lockheed Martin Aeronautics, a business unit that supports key military aviation platforms such as the F-16, C-130, and F-35 Joint Strike Fighter, as well as Advanced Development Programs (Skunk Works”).

He earned his M.S. degree in Manufacturing Systems Engineering from the University of Texas at Austin in 1991, and a M.S. in Management from Stanford University as a Sloan Fellow in 2001.
Harnessing tech for optimum security

Homeland security needs to keep pace with the increasing technological prowess of sources of threats. The adoption of Command, Control, Communications, Computing and Intelligence, Security, Reconnaissance (C4ISR), which makes extensive use of geospatial technologies, provides security forces the wherewithal to do so.

With the increasing frequency and diverse nature of threats to the State, what previously used to take place as uncoordinated activities by different branches and chapters of law-enforcement agencies, is now consolidated under an architecture that allows disparate agencies and their chapters to gather specific and useful information, and share the same across a network of interested parties. This architecture, loosely termed homeland security is, today, seen as vital to the continued survival of the State. Homeland security needs to leverage the technological advances and practices of the day, to keep pace with the increasing technological prowess of sources of threats. The adoption of C4ISR (Command, Control, Communications, Computing, and Intelligence, Security, Reconnaissance) concept, from military practice, provides homeland security the wherewithal to do so.

C4ISR can be thought of as a framework for organising multi-media information emanating from a situation (typically a crisis), in a manner that enables non-local users to analyse such information (from multiple sources): act

Border/Coastal Surveillance

Unregulated borders and coastlines are the chinks in a nation’s homeland security armour. Smuggling (contraband and human trafficking), illegal immigration, and terrorism are the three threats to a country’s security, most likely to exploit the porosity of unregulated borders and coastlines. Think of the 26 November Mumbai attacks or think of the smuggling of contraband through the borders of Gujarat, Jammu & Kashmir or Rajasthan. C4ISR Border/Coastal Surveillance Systems (B/CSS) seek to significantly reduce, if not eliminate, the incidence of such activities.
applied to border/coastal surveillance (B/CSS) and critical infrastructure protection (CIP).

As can be seen from the above functional flow (Figure 1), there are four components of a C4ISR solution:

- Sensors (Remote Sensing)
- GPS
- GIS
- Command & Control Application

Operational Components

Before going into further details of the technologies used in C4ISR solutions, it would be useful to gain a perspective on the operational components of a C4ISR solution, as

on that information or advise local players on actions to be taken; receive feedback from local players on actions taken; based on which a follow-up set of actions or advice can be initiated, to resolve the situation to the advantage of the users. C4ISR systems make extensive use of technology: especially geospatial technologies.

Critical Infrastructure Protection

Critical Infrastructure Protection (CIP) is the term used to refer to the systems and processes implemented to ensure that designated critical assets are protected from actions intended to curtail, seriously disrupt, or altogether prevent their functioning. A critical infrastructure need not refer only to physical assets of national importance (ports/airports, nuclear facilities, Parliament etc.); it may refer to any asset (physical, virtual) considered by an organisation (government, parastatal or private), as vital to its functioning. A C4ISR CIP solution provides comprehensive cover to key infrastructure.

Sensors

Sensors are the eyes, ears, and skin of a surveillance network, and the effectiveness of the surveillance set-up in a particular environment is critically dependent on the type and specifications of the sensors employed in the network.

How many times have we heard of a jewelry store heist where the surveillance footage was of little use because the resolution of the installed surveillance cameras was too low; because the lens used was not right; because the entrance-facing camera did not feature a WDR (Wide Dynamic Range) sensor or support BLC (back-light compensation).

There are a variety of sensor technologies in the market. Fig. 2 lists many of the popular sensor technologies, their delivery platforms, and the communications fabric, with respect to B/CSS and CIP requirements.
Given a plethora of options, users typically apply the following thumb-rules when choosing among sensor technologies for specific situations:

- Implement a design comprising layers of sensors, with each layer delivering an increasing resolution of the entity-under-surveillance, as it approaches a defined boundary: for example, radars may be employed to track entities at a distance of 5-50 kilometres; long-range thermal cameras may be employed to track entities at a distance of 1-5 kilometres; and high-resolution optical cameras may be employed to track entities at a distance of one kilometer and below.

- Each layer may be a mix of technologies, such that blind-spots in one technology are visible in another; and such that counter-measures by the entity-under-surveillance do not render the entire surveillance layer dysfunctional: for example, in the case of surveillance on land, a mix of radars and vibration sensors may be implemented in one layer to preclude the possibility of the entity-under-surveillance evading observation by employing radar-masking techniques.

- Data from different sensor technologies can be combined to deliver a level of information significantly greater than can be provided by each of the individual technologies.

**GPS Receiver Module**

Built around the SiRF Star III chip, the GPS Receiver Module from Mistral is the world’s smallest high-sensitivity GPS module. The 20-channel GPS receiver is capable of giving accurate details of location, altitude, velocity, and direction. This fully functional RF module receives spread spectrum signals from the MEO (Medium Earth Orbiting) satellites.

It features a low-noise RF amplifier with sensitivity below -159dBm; and has the ability to withstand ESD up to 2000V. The GPS module is PCB mountable, with a very small footprint; and can be easily integrated in a wide range of applications in the defense and consumer electronics segment. These include portable navigation, cellular phones and other communication equipment.
in isolation. This data fusion is typically handled at the application level (command and control application or sensor management software).

Choosing a sensor technology will be a function of parameters such as cost (or budget), the potential entities-under-surveillance, surveillance range, the terrain of the area-under-surveillance, and the features to be captured (of the entities-under-surveillance). Fig. 3 shows a range of sensors used in a typical CIP implementation.

**GPS**

The second important geospatial component of a C4ISR solution is the device that allows user resources to be tracked in real-time, in terms of location and movement. All C4ISR solutions include a Blue Force Tracking (BFT) module.

Blue Force Tracking (BFT) is a United States military term used to denote a GPS-enabled system that provides military commanders and forces with location information about friendly (and despite its name, also about hostile) military forces. In military symbology, the colour blue is typically used to designate friendly forces while red is used for enemies, and green or yellow are used for neutral forces.

A BFT system, at its simplest, consists of a GPS device and a means for relaying the GPS information to a monitoring centre: a police patrol unit may have a VHF radio set with the GPS device integrated in the microphone, so that location information is transmitted to the monitoring centre at the touch of a button. More sophisticated BFT systems will allow relaying of mobile sensor data, providing additional information specific to the location, etc.; along with the transmission of the coordinates.

Depending on the terrain being traversed, the GPS device will need to support a level of sensitivity that will allow it to function at all times.

**GIS**

The cartographic module is an important component of a C4ISR solution. A detailed digital representation of the area-under-surveillance will allow the user to integrate the data from the sensors and the GPS receivers on to map, and allow the user to associate real-time sensor feed with a location or feature on the map, as well as track its resources visually. The cartographic module typically imports maps from a third-party and then allows situation-specific interpretation to be imported or added to the maps. Multiple maps can be imported and used, provided they conform to widely used formats.

**Command & Control Application**

The command and control component integrates the feed from the sensors and GPS receivers with the cartographic representation of the area-under-surveillance, and allows the user to initiate SOPs in the event of an incident, query and receive additional information from sensors and resources in the field in real-time, and send out instructions to the resources on how to respond to an incident.

All this happens in a coordinated manner – even if there are multiple decision-makers participating from different locations – and with all available information at the fingertips of the decision-makers (common operational picture or COP). The command and control application sometimes also provides, through additional hardware, the capability to patch multiple communications protocols; thereby allowing different field units (some on V/U/
HE, others on GSM or CDMA etc.) to communicate transparently with each other. Such a communications matrix is extremely effective in maintaining command and control during crisis situations.

Finally, given that duplication of information is bound to happen during an incident, the application automatically recognises the reports of an incident that are similar, and allows a user to de-duplicate such information.

**Desiderata of a C4ISR homeland security solution**

Choosing a Homeland Security solution – B/CSS or CIP – based on a C4ISR framework should be a decision taken on the basis of support for the following functionality:

**Interoperability**

By interacting with legacy systems of involved agencies and with deployed mobile units as well, it is possible to develop a higher resolution picture of a crisis situation. For this purpose, a data model such as the standard JC3IEDM should be used, and web services should be XML-based.

**Sharing Mechanism**

Sensor data should be managed by publication/subscription mechanisms: the operator subscribes to the information or services offered by the solution, which incorporates a middleware layer in charge of searching for the information and publishing it to subscribers. This allows information to be received and consolidated in a database in real time.

**Openness**

Sensor-independence allows the solution to integrate new sensors (based on new technologies) at a future point in time. Cartographic independence allows the solution to support a variety of map formats.

**Architecture**

A decentralised and service-oriented-architecture (SOA)
allows the system to be managed from any fixed or mobile network device, providing an added robustness, in the event of failure or crisis situation.

**Low-bandwidth protocol:**
Data synchronisation mechanisms used should allow information to be shared in real-time, at rates as low as less than 10 kbps, for the solution to function effectively in crisis situation.

**Case Study**
This case study is of a C4ISR B/CSS implementation in Spain, covering Spain’s maritime border with North Africa (specifically Morocco). The problem Spanish authorities had was that this stretch of the maritime border was being used for illegal immigration and drug smuggling, and that the number of incidents were increasing at an alarming rate.

As can be seen in Fig. 6, the implemented system manages all phases involved in border management. The graph on the right plots the progress of the entity-under-surveillance towards the Spanish shore, with distance from the shore being plotted on the Y-axis, and elapsed time since detection being plotted on the X-axis.

The table on the right provides the phase-wise figures for three scenarios – detection at 20 to 16 kilometres, 15 to 11 kilometres, and 10 to 8 kilometres. The effect of the C4ISR B/CSS implementation, in this case, has been a staggering fall in the number of incidents featuring illegal crossing and drug-running across the maritime border covered by the solution.

**Conclusion**
Geospatial technologies can be used to deliver a far stronger implementation of homeland security solutions. In this connection, it is important to leverage the latest in the respective technologies (remote sensing, GPS, GIS) so that as detailed a COP (common operational picture) as possible is provided to decision-makers.

In addition, these implementations, across various law-enforcement agencies, should support a level of interoperability that will allow them to share relevant information in real-time.

Homeland security is too critical a responsibility to be left to be addressed through silo-type responses. C4ISR solutions, leveraging the latest in geospatial technologies, promise and deliver significant improvements in the manner the State responds to threats to its existence.

---

All illustrations in this article are the property of Amper Sistemas and/or Mistral Solutions Pvt. Ltd. They cannot be copied and reproduced without the permission of the concerned parties.
Capturing relevant geospatial data and getting it to decision-makers and warfighters in a timely fashion is an ongoing priority for the US military and the intelligence community. For today’s warfighter, there is an abundance of data available from many geoint sources. In addition, rapid changes continue to be made in deploying technologies that make geoint timely and actionable to the edge of the network and beyond.

Rather than relying on maps that are printed weeks or even months prior to an operation, warfighters now rely on geoint data that can be accessed on a computer in a disconnected environment or even printed in the field by a
mobile terrain team. While the role of geospatial intelligence in military operations has evolved over the past decade, access to geospatial assets, particularly those in digital form, has typically been limited to a small number of geospatial specialists.

Today, the ever-changing military landscape emphasises network-centric capabilities that empower every warfighter with robust information. GeoINT in the form of dynamic, digital maps, imagery and intelligence data is now the backbone of all intelligence, and acts as a cornerstone for the success of deployed warfighters around the world.

The US military and intelligence community now deploy innovative geoint collaboration tools that even warfighters and intel operators with no geospatial training can use. TerraGo GeoPDF maps and imagery and geospatial collaboration software are now widely deployed across defence and intelligence for enabling technical geospatial experts and forward deployed warfighters to distribute, reference, enhance and share geospatial information.

TerraGo Technologies invented the geospatial PDF, which is a PDF map or image that has been georeferenced so that geographic coordinates are embedded in a compact and portable intelligence product. With TerraGo Toolbar, an extension to the ubiquitous Adobe Reader and Acrobat software, operational personnel interact with GeoPDF maps and imagery to access, capture and share geoINT. TerraGo GeoPDF technology’s unique value is that it delivers a customised, interactive geospatial intelligence product that can be used by anyone, not just geospatial experts, in disconnected environments such as the battlefield or disaster areas.

How GeoPDF Technology Works

GeoPDF delivers customised maps and imagery that are configured by a geospatial expert to include layers and features from a GIS or imagery analysis software. This provides the end user with a base map. In the field, the warfighter can leverage the GPS capabilities of his device or the coordinates on the GeoPDF to navigate and improve situational awareness of the terrain and infrastructure in the area of operation.

GeoPDF also integrates a wide variety of intelligence such as mark ups, ground photos, audio, video, text documents, and hyperlinks into a deliverable that is compact enough to be easily distributed and loaded onto mobile devices (laptop or handheld).

GeoPDF products and software such as TerraGo Toolbar enable operators beyond the edge of the network to capture data about items that are not on map. This enables the warfighter to act as a sensor, capturing and sharing valuable on-the-ground intel.

Finally, GeoPDF provides a platform for geospatial applications. TerraGo Toolbar enables collaboration through georeferenced mark ups and the ability to import and export field data. GeoPDF maps can be assembled into robust map books that provide a portable, digital atlas. Even more advanced applications that leverage geocanvas enable near real-time intel sharing.

For example, when a user prepares for a mission in an area with connectivity provided by mobile SATCOM or other means, GeoPDF intelligence products can be dynamically updated with up-to-the-minute data and multimedia – all in a geospatial context. The warfighter can also collect and roundtrip intel back to command, vastly enhancing situational awareness. With GeoPDF as a platform, all users have customised maps and imagery that are geospacially intelligent.

Over the past few years, geospatial experts and field personnel alike have come to expect the availability and portability of geospatial assets, partly due to the proliferation of GeoPDF maps and imagery.
The US military and intelligence community (IC) use and disseminate GeoPDF maps and imagery in support of critical operations around the world. In fact, these users were among the first to recognise the value of GeoPDF for map and geospatial data distribution.

As a result of this early adoption by the DoD (Department of Defense), today GeoPDF is widely deployed for distribution of maps, imagery and 3D-derived products throughout the chain of command and out to personnel beyond the edge of the network. Many agencies are now required to produce geospatial PDF products as an end-user deliverable for reporting, collaborating, operations planning and intelligence gathering.

Starting in 2004, there were numerous key organisations within the US military and IC that began to work closely with TerraGo Technologies to explore and deploy GeoPDF for map and geospatial data distribution. At first, organisations began investigating the use of PDF as a method for improving the speed of delivery of its map products through a print-on-demand service.

The application of GeoPDF and software such as TerraGo Toolbar quickly advanced as it became clear that in addition to the printing advantage of PDF, there were also substantial advantages from the geospatial display functionality as well as layering, feature data, and file compression features. Finally, as the technology advanced, warfighters and intel operators increasingly adopted GeoPDF mobile applications, collaboration functionality, and other capabilities.

Initially, GeoPDF advanced as government organisations developed a series of hardcopy Iraq atlases for use by the US and coalition forces to assist in navigating the complex and poorly mapped Iraqi cities and terrain. After the success of these products, leading agencies converted most standard map and imagery products to GeoPDF. In 2006, approximately 90,000 map documents in a central library of geospatial assets were converted from paper to GeoPDF. Extending this, the US Army Geospatial Center (AGC) followed by assembling Country Area GeoPDF MapBook products that provide information-rich GeoPDF atlases of more than 140 countries. Furthermore, the AGC implemented TerraGo server-based solutions that enable end-users to explore assets available for an area of interest via a browser and select which type of data is required to create a custom GeoPDF MapBook product.

The AGC continued to work closely with TerraGo to innovate and develop additional geospatial products such as map books for urban mission planning and operations. These information-rich intelligence products are an example of how GeoPDF delivers a mission-specific intelligence package. These urban combat map books provide a single, multi-page PDF with robust functions for data display and navigation. They represent urban features important to US forces operating in complex and changing urban environments. These map books enable visualisation and analysis of key aspect of areas of operation, including built-up terrain zones, buildings of interest, roads, railroads, streams, forests, marshes, water bodies and vertical obstructions. These map books serve as operational planning tools to support Military Operations on Urban Terrain (MOUT). Because GeoPDF can be updated with new imagery and data, timely intel is available at the most critical times.

Extending geospatial applications: 3D GeoPDF

As GeoPDF products and capabilities are adopted throughout the US government as well as allied governments, TerraGo and its customers continue to innovate with GeoPDF and develop new applications. One exciting example is 3D GeoPDF. Now more than ever, the US...
military and intelligence community rely on maps and imagery that include elevation information as well as geographic coordinates. Operations in mountainous terrain such as that in Afghanistan require a three-dimensional representation of the battlefield. As such, the DoD has worked with TerraGo Technologies to develop a unique tool that gives GIS experts the ability to extend the value and application of their extensive libraries of elevation data. In addition, it allows users to view geographic coordinates, measure length and distance, and geo-locate a point on a 3D map.

Now, the AGC uses TerraGo 3D Composer™ software to create 3D GeoPDF products that leverage LiDAR and DEM data to create georeferenced 3D intelligence products that operate with the TerraGo Toolbar. What makes this capability particularly useful is the same as the overall GeoPDF value proposition: virtually anyone who knows how to use PDF files with Adobe Acrobat and Reader can access and interact with LiDAR and other sources of rich geospatial data. And with the dramatic increase in elevation data collection in recent years, the ability for more users to share and easily understand the data is becoming increasingly important.

Better information sharing

With the abundance of geoint data available today, GeoPDF technology plays a major role in distributing geoint to any user and enabling warfighters to capture and share timely on-the-ground geoint. Through greater access to rich data and the ability to collaborate with spatially aware information at all levels of operation, users can significantly enhance decision-making, improve response time, and more effectively, accomplish their mission.

From a policy perspective, General James R. Clapper, the new Director of National Intelligence (DNI), announced last summer that Robert Cardillo, the Defense Intelligence Agency’s Deputy Director, will now serve in a newly created position within the ODNI called Deputy Director for Intelligence Integration. In this position, Cardillo will bring together the roles of analysis and collection to advance information sharing and collaboration between these two essential functions.

The combination of key policy changes, more accountability at the DNI level, and the use of innovative collaboration technologies will help make great strides in helping keep data timely, relevant and actionable.

Conclusion

The US military and intelligence community continues to focus on enabling the frontline warfighter with real-time intelligence and advanced capabilities for capturing and sharing intelligence. GeoPDF technology has been a key advancement to taking geospatial assets that were previously only available to experts with sophisticated software, and delivering it in a digital, interactive intelligence product which anyone can use.

This changed the way information is shared with the warfighter and key decision-makers. This helped in addressing the ongoing challenge of making Intel data relevant and actionable.

Now, GeoPDF technology and its applications are advancing to enable ever more innovative geospatial applications. These include GeoPDF MapBook intelligence products, 3D GeoPDF, server-based delivery solutions, geojavascript-enabled dynamic GeoPDF maps, and more.

Today, the leading agencies of the US government, which constitute the largest network of geospatial resources in the world, leverage GeoPDF as a key technology for delivering advanced geospatial assets to operational users.
In many ways, the US military engagement in Afghanistan is much like the movie Groundhog Day. While our troops are not experiencing the exact same day over and over again, they are often engaging in similar battles that repeatedly occur in the same locations. The endless loop of battles not only slows down our overall military efforts, but also causes a morale deficit among our troops. The key to breaking out of this cycle is to have actionable intelligence data that is timely. From a data retrieval standpoint, it takes weeks for the necessary information to get into the hands of the warfighter. By the time the warfighter gets the information, whatever mission the troops were engaged in becomes ancient history, resulting in a case of too little, too late.

Marv Gordner
Programme Manager, Intelligence Solutions
MorganFranklin Corporation

Deciphering Intelligence

Militaries throughout the world are drowning in intelligence data. The challenge for them is no longer to collect data but to retrieve and analyse it to make it actionable.
Why does this happen? Simply put, there is just too much data and not enough means for retrieval. It is no secret that the US military is drowning in intelligence data — especially Geoint data — and we need to develop innovations that focus on data retrieval. Otherwise, all of our investments in data collection technologies will go to waste.

At this year’s C4ISR Journal Conference, the topic of “too much data” was a key theme that resonated with the keynote speakers. Speaking about data retrieval, Brig. Gen. Vincent Stewart, the US Marine Corps director of intelligence, said, “It is no longer looking for a needle in a haystack, but now it’s a needle in a stack of needles.”

According to a recent Defense News article, Stewart also said that intelligence analysts need to spend more time actually thinking about data rather than sifting through it. It is estimated that analysts spend roughly 80 per cent of their time conducting research, and only 20 per cent of their time developing solutions. The critical thinking that analysts bring is the secret sauce for having truly actionable intelligence.

So how did we get here? We have simply experienced a period of rapid growth and development in Geoint technologies. If you look at the annual GEOINT Symposium hosted by the United States Geospatial Intelligence Foundation (USGIF) as a key indicator of growth, the event has tripled in size and scope over the past six years. Many of the key players are companies that have also expanded in their development and capabilities. These players include DigitalGlobe, ERDAS, TerraGo, GeoEye, and other government contractors.

Along those lines, the theme for this year’s GEOINT Symposium was “GEOINT 3.0,” which reinforced the value of innovation in defence and intelligence. The event featured 220 exhibitors showcasing the latest and greatest in technology and services. In a world that uses the terms “Web 2.0” and “Gov 2.0” rather freely, the idea of the next generation in innovation is certainly exciting. The big question is whether the promotion of “GEOINT 3.0” will spawn more data collection innovations, or if this new movement will advance the “1.0” version of data retrieval.

In addition, the National Geospatial-Intelligence Agency (NGA) is making a significant investment in the development of commercial imagery. This past August, the NGA announced that it awarded DigitalGlobe and GeoEye its EnhancedView contract. Valued at USD7.3 billion dollars, the EnhancedView programme is designed to procure satellite images for use by the US Department of Defense (DoD), intelligence agencies and other parts of the federal government.

While the EnhancedView contract is a big deal for industry and the Geoint sector, the challenge is that it will create more satellite images. This is typically a good thing, but it may add more needles to the needle stack.

On top of that, technology advancements in the areas of...
full-motion video, 3-D imagery, remote sensing LIDAR, GeoPDFs, and cloud-based solutions have made it possible for analysts to experience cutting-edge benefits such as sharing and marking up 3-D GeoPDFs in real time via handheld devices. Again, although the Geoint data collection revolution has been remarkable, the next phase of this revolution should focus on data retrieval.

But what would this data retrieval revolution look like? Would it involve hiring more analysts? In a time of defense budget cuts, the DoD would likely not make a significant investment in hiring more personnel to match the growth in sensor development.

Maj. Gen. James Poss, the US Air Force Assistant Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance, said at the C4ISR Journal Conference that we would need between two and 802 individuals to process and disseminate unmanned aerial vehicle (UAV) data. According to Poss -- in a partially tongue-in-cheek comment -- this group of people would comprise the pilot, the sensor operator and 800 analysts.

Another major issue exists around knowledge management, which refers to data that has already been retrieved but not managed correctly. For example, server crashes and the issue of analysts storing their own data (and then leaving, making the data unavailable) continue to be very basic IT management issues that actually create these Groundhog Day scenarios. It may be surprising to outsiders that these basic
IT information management issues occur regularly on the battlefield, but unfortunately they do happen.

From an analyst perspective, there are also inherent challenges in the clearance process that play a major role in slowing down the acquisition of the right talent. Gaining clearances costs money and takes a tremendous amount of time. Often those who receive the clearances do not have the senior experience needed to best analyze data and spot risks and opportunities. As a result, the intelligence community (IC) is experiencing a war for talent, and the battlefield is mired with extended clearance processes and delays that go against the objective of quickly analyzing data and making it actionable in near real time.

Another issue is training analysts who can quickly be deployed in both Afghanistan and the US. The DoD and the intel community need to quickly access trained analysts who can step in and provide key insights to support current missions. In many ways, industry has stepped up and provided outsourced analysts who possess the experience and technical backgrounds needed to fill this void.

For example, many contractors bring tremendous value by providing talent that can be rapidly deployed, as well as deep expertise in areas of national technical means (NTM), commercial services, overhead non-imaging infrared (ONIR), and full-motion video (imagery/geospatial analytical support) to support OCONUS and domestic missions. The talent must be readily available and deployed quickly, and this is where industry excels.

What many do not realize is the tremendous value that the contractor community provides to the intel community. The Blackwaters of the world and other contractors that provide force protection on the ground have stirred up a formidable amount of controversy in the mainstream media for their nefarious battlefield tactics. While most defense contractors are not looking for accolades from the mainstream media and most possess deep backgrounds from the NGA and other intel agencies, as well as military service.

In a separate vein, it is no surprise that the intel community still comprises stovepipes that stifle collaboration. In the wake of the September 11 terrorist attacks on the US soil, this issue was brought to light and spawned the creation of the Office of the Director of National Intelligence (ODNI). Its mission is to serve as the head of the IC and provide a level playing field for collaboration and information sharing.

Beyond the usual stovepipe issues, the challenge with information sharing and collaboration in today’s IC is the massive amount of available data that is impossible to analyze, let alone share. Some have argued that the best solution is to provide widespread access to raw and processed sensor data across services and systems. This would ultimately mean that every analyst, decision maker and warfighter in the chain would be sharing the processing load.

During the GEOINT Symposium, Letitia Long, Director of the NGA, highlighted her new vision for bringing the agency into the “3.0 world.” She spoke of providing online and on-demand access to geoint knowledge, ultimately granting access to the agency’s content, services and expertise through more open-sourced solutions. This would certainly augment the creation and sharing of geoint data, but it is not surprising that bringing this vision to reality has been highly challenging.

While this solution levels the playing field and hopefully breaks down the silos, it still does not address how to analyze all of the available data. In a perfect world, the warfighter’s PDA would be equipped with distilled intelligence providing locational data, cultural insights from localised populations and other information needed to ensure a successful mission.

Fortunately, many members of government and industry have not only voiced their concern for this issue, but are also proactively developing solutions. The Grounding Day phenomenon is unfortunately alive and well for the warfighter. The combination of the push for data retrieval technologies and the desire to staff the right analysts will hopefully make this a non-issue. Otherwise, we will have too much viable data left on the cutting-room floor and soldiers will be stuck in the cycle of fighting the same battles.

One final thing to remember is that many analysts and warfighters share a sense of duty when it comes to sharing information. Many (myself included) are willing to follow the lead of former CIA Director Gen. Michael Hayden, who believed that we have a duty to share information. This often involved taking career risks to share information that ultimately advanced the mission, but isn’t that what it’s really all about?
The question of effective delivery of imagery and analysis tools to the operator in-theatre remains key to every defence organisation. Accurate and timely imagery needs to not only arrive at the right destination on time, but also be used in concert with the available analysis and decision-making tools. The latest use of imagery and imagery analysis tools in war, in national security operations and in strategic planning, will be the focus of several presentations at DGI 2011. The other major theme at the event will be the reduction of spend and the need for defence and military geospatial intelligence.

Hundreds of geo-specialists, C4ISR and architect commanders are expected to gather at the event to discuss how Geoint is affecting and impacting every aspect of the world’s armed forces. Over 50 speakers have so far, confirmed their participation which include the likes of Stuart Haynes,

"It is important to understand that, for us, it’s not technology that will make a difference now. It’s how we use the technology within defence. It’s how we make sure that we get information to people; it’s how we make sure that all information is specially referenced in some way so we can use it in GIS. A whole range of images and data needs to be referenced in some way to be used effectively."

Colonel John Kedar
Former Commander
JAGO, UK MOD

DGI 2011 is all set to become one of the largest gatherings for the world’s geospatial intelligence community

What: Defence Geospatial Intelligence (DGI) 2011
When: January 24-27, 2011
Where: London
Director, Defence Geographic Centre, Intelligence Collection Group, UK MoD; Sabato Rainone, Chief, Geospatial Section Information and Security Division – Policy Branch, Italian Defence General Staff; Colonel John Fitzgerald, Senior Staff Officer, Intelligence Policy, International Military Staff HQ NATO; and Brig. Gen. Walter Schmidt-Bleker, Director, Bundeswehr Geoinformation Office (BGIO), Germany, among others.

Nearly 50 solution providers will showcase their products at the exhibition. There will also be Live Demo presentations by various companies. Moreover, the exhibit area will have a Special Innovation Zone, featuring not only the big technology players, but also the most innovative, new companies with their best ideas and solutions.

Day 1 (Jan 24) - Technology Innovation Focus Day

The day is designed to focus on new technologies and solutions that can be turned into real geospatial intelligence capabilities. Senior geospatial executives from various armed forces like the US, the UK, Norway, Afghanistan, Denmark and companies like Esri, DigitalGlobe, Vexcel, etc will share their views about the topic, explaining the latest solutions and how they exploit technology and technological solutions in their GIS capabilities. Case study presentations from defence and national security organisations and live demonstrations will form the basis for the day.

Day 2 & 3 (Jan 25 & 26) - The Defence Intelligence and GIS Software Conference and Exhibition

The two days are dedicated to main conference and exhibition.

Air Marshal Sir Stuart Peach, Chief of Joint Operations at the UK MOD, will open the conference by speaking about his vision for geo capabilities in modern warfare, in command and control and in-theatre. Air Marshal Peach is responsible for the planning and execution of all UK military operations. He will be giving insight into the strategic role of geo capabilities in intelligence collection and analysis, as well as showing examples of effective use of Geoint.

The morning opening session will also feature a guest keynote address from Vanessa Lawrence, Director General and Chief Executive of Ordnance Survey. Given the key role Ordnance

“Data management will become the key to success and the demand for Geo technician will increase (and has increased) as systems come online. Data available could become the key factor in conducting operations.”

- Lt. Col. Michael Cairns
National Defence, Canada

KEY THEMES

GIS strategy: Presentations from heads of Geo departments in different MoDs across the world. They will be focusing on the strategic role of geospatial intelligence in defence operations, giving real life examples of how GIS is vital to the success of any campaign.

GIS support in-theatre: Officers who have just returned from Afghanistan and other key locations will demonstrate how they used geo capability, what support it gave them and what results they achieved in-theatre.

Geospatial architecture: Most defence IT, systems and GIS software will soon be based on map and fully integrated with all available geo capabilities. Given the importance of integrated networks, a special session is dedicated to speakers who will talk about interoperability and integration of GIS capabilities into the overall architecture.

Geospatial intelligence in C4ISR: There will be several case study presentations from different European and North American nations, talking about their experience of implementing a truly integrated GIS strategy in their C4ISR system.

Human Terrain Analysis (HTA): Most MoDs are rapidly developing their HTA strategy, making it a key part of their GIS capability. The last day’s debate will feature case studies, presentations, debates, panel discussions and new solutions to HTA.

Geospatial solutions and technologies exhibition: Speakers will talk about the latest ideas, concepts and capabilities, which are currently being developed and tested in defence intelligence.
Survey will play during the London 2012 Olympic Games (it is responsible for mapping the Olympic sites). Lawrence’s talk is likely to figure around strategies, plans and new ideas for using geospatial information and intelligence in the national security operations in the UK, and is expected to generate a lot of interest among participants.

They will be followed by the likes of John Graham, President, Security, Government & Infrastructure, Intergraph; Steven Ramage, Executive Director, Marketing and Communications, Open Geospatial Consortium (OGC) and others.

The second day of conference will include speakers like Jim Smith, President & CEO, DigitalGlobe, who will talk about innovation; Jim Hockenhull, D ISTAR, UK MoD, who will deliver a talk on ‘Evaluating the strategic role and opportunity for geo capabilities in command and control’; Hassibullah Samadi, Advisor, Afghan Geodesy and Cartography Head Office, AGCHO, who will speak about GIS capabilities in Afghanistan; and Amnon Sofrin, Head of the Intelligence Directorate, Israeli Intelligence Service (ISIS) who will present an Israeli case study on ‘Strategically positioning and using GIS in intelligence’.

The two days of conference will also see senior members from both defence and industry coming together for panel discussions.

Day 4 (Jan 27) - Human Terrain Analysis Focus Day

One of the biggest aspects of this year’s conference is human terrain analysis (HTA). Knowing everything about the landscape is vital. Knowing everything about the people who live in the landscape is even more important and can be the deciding factor in determining the outcome of war. The HTA will be the focus on the last day of the event where speakers will share the latest experiences, strategies and success stories of using the “people knowledge” in-theatre. Senior commanders and strategists from the UK, the US and other countries will debate the best ways of collecting, managing, analysing and disseminating the human terrain data.

With inputs from Defence Geospatial Intelligence (DGI)
EVENTS

January 2011

Gulf C4ISR
10-12 January, 2011
Armed Forces Officers Club
Abu Dhabi, UAE
www.wbresearch.com/gulfc4i

IQPC Airborne Early Warning and Battle Management
19-20 January, 2010
Cologne, Germany

IDGA 7th Total Asset Visibility for Defense
24-26 January, 2010
Washington DC, US
www.totalassetvisibilityevent.com

Underwater Battlespace
24-26 January, 2011
Radisson Blues Hotel, Rome, Italy

Defence Geospatial Intelligence (DGI) 2011
24-27 January, 2011
QEI Centre, London
www.defencegeospatial.com

Joint Forces Simulation & Training
25-26 January, 2011
Hilton Tower Bridge Hotel
London
www.smi-online.co.uk/events/overview.aspx?id=1&ref=3507

Marine West 2011
26-27 January, 2011
MCB Camp Pendleton, CA, USA
www.marinemilitaryexpos.com/marine-west/show

Soldier Technology US
31 Jan - 3 Feb, 2011
Marriott Gateway, Crystal City
Arlington, Virginia, USA
www.soldiertechnologyus.com

February

Unmanned Systems Program Review 2011
1-3 February, 2011
Omni Sheraton Hotel, Washington DC

Soldier Modernisation India 2011
1-3 February, 2011
New Delhi, India

Aero India 2011
9-13 February, 2011
Air Force Station Yelahanka
Bengaluru, India
www.aeroindia.in/Main.aspx

Navdex 2011
20-24 February, 2011
Abu Dhabi National Exhibition Center (ADNEC), UAE
http://www.navdex.ae/

Mobile Deployable Communications
28 Feb - 1 March, 2011
Marriott Prague, Prague
Czech Republic
http://www.smi-online.co.uk/events/overview.aspx?id=1&ref=3509

Defense Maintenance and Sustainment Summit
February 28 - March 2, 2011
Hilton San Diego Del Mar - San Diego, US
www.defensemaintenance.com

March

Avalon Australian International Airshow
1-6 March, 2011
Avalon Airport, Geelong
Victoria, Australia

Soldier Modernisation Asia
14-17 March, 2011
Amara Sanctuary Resort Sentosa
Singapore

New Concepts in Armour Engineering
16 - 17 March, 2011
Technion (Israel Institute of Technology)
Haifa, Israel

April

Latin America Aero & Defence - LAAD 2011
12-15 April, 2011
Rio de Janeiro, Brazil
www.laadexpo.com

SPIE Defense, Security and Sensing
25-29 April, 2011
Orlando World center Marriott resort, FL, USA
http://spie.org/defense-security-sensing.xml

May

USSTRATCOM Cyberspace Symposium (AFCEA)
5-26 May, 2011
Omaha, NE, USA
www.afcea.org/events
US Geospatial Intelligence Foundation (USGIF) recently held its annual symposium, GEOINT Symposium 2010, centered on the theme, “GEOINT 3.0”. More than 200 exhibitors, an increase from 174 in 2009, and over 4,000 total attendees, which were also up from about 3200 in 2009, participated in this four-day event. The occasion also witnessed enthusiastic participation from academic exhibitors with about 10 higher educational institutions setting up their stalls. Little wonder, USGIF described it as “the largest, and by all accounts, the best GEOINT Symposium to date”.

The first day revolved around technology and academics. The academic session featured the likes of Dr Max Baber, Director of Academic Programmes, United States Geospatial Intelligence Foundation; Chuck Benton, Technology Education Specialist and Chair, Practical Arts Department, Dover Area High School, Pennsylvania; and Stewart Bruce, GIS Programme Coordinator, Center for Environment and Society, Washington College, who talked about the education challenges and opportunities in this sector. The technology session had representatives from the National Geospatial-Intelligence Agency (NGA), Defense Intelligence Agency and various organisations who talked about the path-breaking technology projects within the intelligence community, and the process by which research is planned, funded and evaluated.

“We’re shifting from how we use multiple sources to how we use multiple disciplines to come up with new methods and new ways to make sense out of all kinds of data,” said session moderator Edward T. Cope, who manages NSG RDT&E for NGA.
He was followed by Gen. Bruce Carlson, US Air Force (retd), Director, National Reconnaissance Office who talked about the recent satellite launch and outlined his organisation’s priorities.

Caryn A. Wagner, Under Secretary for Intelligence and Analysis, Department of Homeland Security, was another keynote speaker of the day. Speaking on the occasion, she said that they are looking for ways to use geoint to improve the analysis of potential homegrown violent extremism.

“...We're trying to figure out how geospatial data can be...”

Stressing upon the need to bring in flexibility in the process of R&D, Dr H. Gregory Smith, NGA’s Chief Scientist and Deputy Director of its InnoVision Directorate, said, “There is a need for a type of approach to evaluation that can better express the value that they add to the enterprise. Part of the key in freeing up a programme to be more risk tolerant is to be able to communicate the value that an innovation programme can bring to the enterprise – not just technology, but also processes.”

Day two was full of activities and featured discussions on varied topics like ‘Maritime domain awareness’, ‘Open source in the 21st century’ and ‘GEOINT insight and influence through functional management’. The day’s opening keynote was delivered by James Clapper Jr., Director of National Intelligence. His talk focused on his future plans for the Office of the Director of National Intelligence (ODNI). Explaining his vision of a revamped intelligence structure, Clapper said, “We’re putting together collection and analysis, which previously were managed as separate endeavors. We’re integrating those and putting them under one management hat,” adding that he had selected former NGA and DIA official Robert Cardillo to lead the effort.

Advocating for the latest technology, Marine Corps Gen. James Cartwright, vice chairman of the Joint Chiefs of Staff., said that better intelligence technology, such as full-motion video and wide-area surveillance, need to be more persistent and fielded more quickly.

“The utility of a still image is not useful on the battlefield,” he said. Instead, service members on the ground and analysts need to be able to understand the “pattern of life” provided by full-motion video.

He also stressed the importance of all data being online and accessible.

“Everything we’re doing today has got to move to digital so that we can store [data], manipulate it, move it to whoever needs it and do it in a timely fashion,” Cartwright said. He expressed frustration with proprietary data standards and formats that hinder information-sharing, which could prevent US forces from keeping up with the enemy.

Better intelligence technology required: Gen Cartwright

Advocating for the latest technology, Marine Corps Gen. James Cartwright, vice chairman of the Joint Chiefs of Staff., said that better intelligence technology, such as full-motion video and wide-area surveillance, need to be more persistent and fielded more quickly.

“The utility of a still image is not useful on the battlefield,” he said. Instead, service members on the ground and analysts need to be able to understand the “pattern of life” provided by full-motion video.

He also stressed the importance of all data being online and accessible.

“Everything we’re doing today has got to move to digital so that we can store [data], manipulate it, move it to whoever needs it and do it in a timely fashion,” Cartwright said. He expressed frustration with proprietary data standards and formats that hinder information-sharing, which could prevent US forces from keeping up with the enemy.

Courtesy: Defense Systems
helpful, both in analysis and in conveying information to senior leaders. We want to know what more we can do with geospatial analysis,” she said.

Wagner explained that her office is focusing on determining different ways in which it can take advantage of geospatial intelligence. For example, it has extensive information on people who travel. “We’re trying to come up with creative ways to do that analysis,” she said, “and looking for new ways to display the information.”

Day three’s discussions centered around technology with participation from both industry and armed forces. Delivering the keynote address of the day, Lt. Gen. John C. Koziol, US Air Force, Deputy Under Secretary of Defense for Intelligence for Joint and Coalition Warfighter Support; and Director, Department of Defense ISR Task Force said plans are underway to create a light detection and ranging (LiDAR) map of the entire nation of Afghanistan. The LiDAR project, Koziol explained, got rolling recently with the arrival of a Gulfstream aircraft, which along with other LiDAR assets will put together high resolution imagery of the country over the course of the next few months.

“If you imagine the impact that’s going to have for both military and civilian operations?” Koziol asked. “It’s critical. Planners for a mission going into a village can see in three dimensions, understanding that a wall is so high, and the dimensions of a building are this. It’s an unbelievable capability.” The contributions of geospatial technology to the counterinsurgency fight, he indicated, included precise geolocation information, the tracking of individuals, knowledge of urban features, “place context” for multi-INT fusion, and information on patterns of life.

The last day saw speakers like Marine Corps General James E. Cartwright, Vice Chairman of the Joint Chiefs of Staff and Lt Gen. Ronald L. Burgess Jr., Director of the Defense Intelligence Agency among others.

During his speech Cartwright spoke about the need to leverage platforms, sensors and data in new ways that provide competitive advantages, “We’re starting to move to sensors that are substantially more capable rather than moving to more platforms.” Stressing on the fact that troops on ground no longer rely only on imagery but also need geotagged videos to better understand the battlezone and plan their strategy, the US’s second-ranking military officer said, “The utility of a still image today is not terribly useful on the battlefield. Seeing the pattern of life from full motion video, if you’re wondering what’s over the hill, that’s what you’re looking for. You’re looking to understand what’s going on and who’s doing what. Frankly, full motion video is what we want to see.”

Meanwhile, Lt Gen. Burgess expressed concern over the potential risks of wide information sharing. The WikiLeaks episode, in which thousands of documents related to the US activities in Iraq and Afghanistan were released over the Internet, “represents what I would consider a big ‘yellow flag,’” Burgess said. “I think it’s going to have a very chilling effect on the need to share. If one alleged individual with a thumb drive or CD burner can vacuum up thousands of documents from a shared drive and dump them onto the Internet for anyone to pick through, and with no hope of getting that toothpaste back in the tube, we as a community face some troubling implications,” he added. USGIF also presented the Lifetime Achievement Award to Jack Dangermond, President, Esri during the event.
Subscribe Today

I would like to subscribe for (tick as applicable)

☐ 1 year (6 bimonthly issues for Rs.500 / US$30)
☐ 2 years (12 bimonthly issues for Rs.950 / US$55)

First name ............................................ Last name ..........................................................
Designation ....................................... Organization ..........................................
Address
City ............................................ State ..................................................
Postal code ....................................... Country ..........................................
Phone .................................................. Fax ..................................................
Email ..........................................................................................................

I enclose cheque no ........................................ drawn on ........................................
dated ........................................ towards subscription for GEO Intelligence
magazine in favour of GIS Development Pvt. Ltd.

Sign .................................................. Date ..........................................

Mail this form with payment to:
GIS Development Pvt. Ltd.
A-145, Sector - 63, Noida, India
Tel + 91 120 4612500  Fax + 91 120 461255 - 666
Netcentricity has been the buzzword among Indian armed forces for quiet sometime now. While the Indian Air Force took the lead with the launch of its digital information grid, the Air Force Network (AFNET), the Navy and the Army are still working in this direction. In this context, Indian Army's Corps of Signals in association with Confederation of Indian Industries (CII) organised a two-day seminar-cum-exhibition in Delhi. The event provided an excellent opportunity for people from defence industry, academia and services to come together and exchange their views on the subject.

Inaugurating the event, Union Minister of State for Defence MM Pallam Raju, said, "Armed Forces are on the threshold of an exciting new era of net-centricity in which they hope to network all sensors, shooters and commanders on converged infostructures." He added, "Providing connectivity for strategic and tactical networks is a challenge, as dispersed forces operate over large geographical areas with diversities in terrain, climate, local conditions and operational uncertainties."

Inaugurating the event, Union Minister of State for Defence MM Pallam Raju, said, “Armed Forces are on the threshold of an exciting new era of net-centricity in which they hope to network all sensors, shooters and commanders on converged infostructures.” He added, “Providing connectivity for strategic and tactical networks is a challenge, as dispersed forces operate over large geographical areas with diversities in terrain, climate, local conditions and operational uncertainties.”

General VK Singh, Chief of Army Staff, who was also present at the occasion, talked about the shift of battle space from being platform centric to network centric. He said, “A strong, robust and secure information grid is therefore a prerequisite for this. The information grid must always act as a force multiplier and an enabler for the soldier as well as the commander in the battlefield.” He then spoke about the capabilities that the armed forces would acquire once they become net-centric. “Once equipped, I see our armed forces increasingly harnessing the power of data and voice networks, thus converting decision makers, sensors and shooters into an efficient and lethal mix of flexible, coordinated and a fast moving combat force that uses information as a weapon to strike with pinpoint precision, and bring unprecedented firepower to bear with a much smaller strength in numbers”, he said.

Lt Gen VS Tonk, Deputy Chief of the Army Staff too reiterated Gen Singh’s vision. “Net-centricity in itself has become a weapon system rather than a support system”, he said, cautioning, “It is, therefore, very important to ensure cyber security.” Successive technical sessions further deliberated upon the net-centricity, its applications and security. The first session of the seminar focussed on ‘Converged infrastructural for a transformed force’, which was also the theme of the event. The session was meant to present the users’ (Army, Air Force and the Navy) perspective to the audience. Giving the viewpoint of the army, Maj Gen AK Srivastava, talked about the future
of warfare and stressed upon the need for identification and development of new technologies, “Cyber war is no longer limited to scientific fiction. It is now a reality and a potent domain of warfare. Also, the future is likely to see a shift in the pattern of warfare – from conventional style to asymmetric warfare.” He then explained how network centricity will help the forces prepare for future battles, “Timely flow of processed information between sensors and shooters are essential enablers for this transformation.” Talking about Indian Air Force, Air Commodore Hemant Sharma said, “IAF is on a fast track to enhance its communication and IT infrastructure to become net-centric. We launched AFNET earlier and will be rolling out 3G WCDMA in six months’ time.” He added, “Our mission is to ensure mobile phone for all IAF personnel.” He also stressed upon the need for a secure network. Briefing the audience about the problems Indian Navy faces in ensuring security of Indian waters, Capt SK Chhetre said, “Navy is a 3-dimensional force as it has to maintain vigil on surface, above surface and under surface.” He then explained how latest technologies will help the navy in fulfilling its duties. Describing network centricity as a continuous and evolving process, he said, “Interoperability among the three forces is essential.”

The session also had another speaker from the army, Maj. Gen. MK Gupta. Speaking about the information sharing philosophy for network centric operations, he raised an interesting point by talking about the dedicated ISR (Intelligence, Surveillance and Reconnaissance) units. He said, “We can’t have multitude of units collecting information in bits and pieces. We need to have dedicated independent ISR units so that the ambiguity and multiplication of the information isn’t there.”

The following sessions belonged to the industry who talked about the emerging technologies and their impact on warfare, potential security threats, solutions provided by various companies and challenges faced by industry. For example, Dr Peter Holliday, Chief Defence Architect, CISCO, talked about the importance of right devices and secure applications among defence services, and then explained how CISCO technology, also known as CISCO Motion, can help in this direction. Similarly, Luca Piccolo, Head of Deployable and Mobile Systems Engineering, Selex Communications, talked about the threat of jamming and the solutions provided by Selex in this regard. Meanwhile Gopi Srinivasan, IT Architect, IBM, raised an important point when he said, “In order to benefit from personal experience and bridge the gap between the old and the new, it is important to create an interaction platform, especially between freshers and people who are due to retire.”

The discussion was carried forward by other delegates who talked about the importance of network security. While Edwin Faier, Director of Engineering, Ultra Electronics, defined information as a pre-requisite for military dominance, Pamela Warren, Cybercrime Strategist Director, Mc Afee, talked about cybercrime and how hackers can break into security corridors and collect confidential data while creating stress on secure network. “Adversaries don’t go through security, but they go around security,” said Sanjay Burman, Scientist ‘G’, Centre for Artificial Intelligence & Robotics, DRDO. He then talked about the importance of laying sound infrastructure, “While coordination is the key for effective management, infrastructure is required for effective performance.” While Burman concentrated on information security, his colleague, MV Rao, delivered a talk on the topic, ‘Scalable and Deterministic Networks including Network Management’ wherein he talked about GIS and NMS (Network Management System). “GIS is a part of NMS and we have taken up indigenisation of both – GIS and NMS,” Stressing upon the importance of IT, he said, “There was a time when offices had no computers. This scenario is unimaginable today. Infrastructure needs to be planned, everything is getting IT based.”

Meanwhile, talking about the possible challenges that the future is going to throw before the users, Col D Kaushal, Commander, 21 Signal Group, said, “Mission demands information superiority for victory, and net-centricity is the way to go. But one of the greatest challenges for the next generation tactical networks is going to be the handling of bandwidth constraints as the requirement for bandwidth is likely to grow in future.”

The problem was soon addressed by Dr Vikram Srinivasan of Alcatel Lucent India Ltd who explained different ways of putting a given spectrum to the optimum use. “Right now, we have spectrums across a broad range. Each of these spectrums is associated with a particular licence,” he said, adding, “The idea is to sniffer out and use appropriate pieces of spectrum for appropriate links for appropriate traffic demands.” By the end of the two-day seminar, everyone agreed that IT is becoming an integral part of the defence sector and in future, even a weapon system would be identified with an IP address. As Lt Gen D Kumar (retd), Chief Executive Officer & MD, Tata Advance Systems Ltd., said, “We have to have a network which is application-oriented network.”

There was also an exhibition alongside the seminar which generated a lot of interest among the servicemen and visitors. Nearly 30 companies like Rockwell Collins, Rolta India, Selex Communications etc. put up their stalls at the event.

Aditi Bhan, Assistant Editor
Water wars?

China recently accepted that it is building the 510 MW Zangmu hydropower project, worth USD 1.2 billion, on the Brahmaputra river (known in China as Yarlong-Zangmu). Reports indicate that the project can be used for irrigation and flood control, which means that it will be capable of storing and diverting water thus causing adverse downstream impact. Indian intelligence agencies have also discovered 24 new projects (reported to be hydro-power projects) being built by China along the river and its tributaries. Experts fear that these projects are being built to divert the river into the northern part of China.

India’s north-eastern region, mainly Assam, Arunachal Pradesh and some parts of West Bengal, are dependent on Brahmaputra for their water needs. There is fear that the diversion of river’s course will turn the area infertile affecting millions of farmers and the region’s flora and fauna. Also, work on dams of this magnitude is likely to enhance the frequency of landslides and earthquakes.

Image Courtesy: Google Earth
Sessions
- Geospatial Intelligence: An Asian Perspective
- Exploiting GIS in Command and Control System
- Emerging Geospatial Technology for Meeting Security Challenges
- National Mapping Policies: Implementation, Challenges and Way Forward
- Common Geographic Reference Framework: Interoperability and Integration
- Asymmetric Warfare: Geospatial Requirement to Counter Treat to Internal Security

Workshops
- Unmanned Aerial Systems - Unmanned and Unbound
- GNSS and Locational Intelligence – Enhancing Situational Awareness

Technical Sessions
- Human Engineering Aspects in Defining Military Symbology
- Combat Identification – Increasing Combat Effectiveness

Data • Analysis • Interpretation
Empowering Effective Decisions
742 Square Miles, 3.8 Billion Terrain Points, 720 Images, 10 Machines, 48 Hours.

Automatically Generated Point Cloud in LPS eATE

Distribute your processing and maximize your resources.

Do you need to process massive imagery datasets quickly? ERDAS empowers you to quickly and completely process your data, reducing your overhead costs:

- **Distributed Processing** enables jobs to be efficiently allocated through the enhanced batch tool in ERDAS IMAGINE 2011 and LPS 2011. We leverage an organization's available hardware resources, increasing production throughput to finish tasks in less time.

- **ERDAS Engine** is a new offering, enabling ERDAS desktop products to run multiple processes simultaneously for surges in production needs or situations requiring faster throughput. Users can distribute demanding, resource-intensive processes among multiple workstations or multiple cores on a single workstation.

With over 30 years of imagery expertise, ERDAS understands the resources required to process and deliver information efficiently. To learn more, please contact us at info@erdas.com or +1 877 GO ERDAS.