China’s Military Doctrines

The US Annual Report 2011 to Congress specifies that over the past decade, China’s military has benefited from the robust investment in modern hardware and technology. Many modern systems have reached maturity and others will become operational in the next few years.

LT GENERAL (RETD) V.K. KAPOOR

In the November-December 1993 issue of Foreign Affairs, an article entitled “The Rise of China” appeared. The article was by Nicholas D. Kristoll, the former New York Times columnist, in which he said that China’s economy would surpass that of the US to become the world’s largest by the middle of the 21st century. He predicted that China’s economic growth would have a certain negative influence on the world’s economy. He said that if there were to be a power vacuum in the Pacific and Far Eastern regions, China would take advantage of it as an opportunity to expand its regional sphere of interest. His observations have turned out to be prophetic. Today, while there is a global fascination for China, the success of China’s national strategy employed so far and flowing from that, its military strategy, needs to be studied and analysed so as to establish the veracity of global concerns regarding China’s conduct and stance in the future. As a first step, strategic and military thinkers need to study the evolution and development of China’s military thought through the ages which would indicate the trend of China’s military strategy and give an insight into the mental conditionings of China’s military leadership and their soldiery. This article briefly deals with the evolution of China’s military thought in the following context:

- The Warring States era
- Maoist military thought
- People’s War under modern conditions
- Active defence
- Local wars under high-tech conditions
- Local wars under conditions of “informationisation”

The Warring States Era

Chinese have their own unique perceptions, which may be difficult to appreciate without an examination of their ancient military thought and ancient statecraft. Recent Chinese writings about the future security environment have referred to “the warring state era” in Chinese history which pertains to the period 475-221 BC. During this age, the...
classes of Chinese statecraft was produced and it was also the time when multi-state competition to become powerful, featured schemes and plots, small wars, inter-state conferences, treaties and anarchy. China’s military authors have called the future multi-polar world quite similar to the “warring states” era and have declared that the future security environment resembles the warring states era in many ways. The Director of Research at the General Staff Department of the PLA has published six volumes of the studies on ancient statecraft in 1996 that contained specific advice of how to comprehend the current and future security environment. In this context, China’s concept of “Comprehensive National Power” and the influence of Sun Tzu’s Art of War are also important driving factors.

Comprehensive National Power (CNP): This is considered an essential aspect of assessing the security environment. It is said to determine the rank order of power held by the various warring states. The current Chinese concept of CNP was invented in the 1990s but stems from Chinese traditional military philosophy. By CNP, it generally means the sum total of the powers or strengths of a country in economy, military affairs, science and technology, education and resources and its influence (China Institute of Contemporary International Relations). In a more abstract manner, it refers to the combination of all the powers possessed by a country for the survival and development of a sovereign state, including material and ideological ethics and international influence as well (Huang Shuifeng, 1999). Sun Tzu identified five things and seven stratagems that govern the outcome of war. Similarly, Wu Zi wrote about six conditions in which if the other sides’ strength was greater, war should be avoided. Ancient Chinese strategists also attempted to help their country achieve dominance through war avoidance strategies. The Chinese are of the view that calculating CNP can aid a nation for war as well as for coordinating a political and diplomatic offensive during a crisis in peacetime.

Sun Tzu’s Art of War was written 2,000 years ago. It throws light on general principles of how the People’s Liberation Army (PLA) may fight in the future. Another source frequently referred by Chinese military thinkers is the 16 military strategies or stratagems, the last of which is “running away as the best choice. Evade the enemy to preserve the troops. The Army retreats: No blame. It does not reflect the normal practice of war.” Other stratagems include deception, ingenuity and stealth—the characteristics which are found in the theory of War and later in the works of Mao Zedong. These ancient and modern texts constitute the military heritage that is imprinted on the soldierly before they enter service and then throughout their professional military education experience. The Art of War begins by proclaiming that “war is a matter of vital importance to the state... It is mandatory that it be studied thoroughly.” PLA leadership is constantly on the lookout for new strategic thinking. Sun Tzu’s main contribution can be attributed to the formulation of military strategy where he argued that “the best policy is to take a state intact” and “to subdue the enemy without fighting is the acme of military skill.” While over-estimating military strength is important, other aspects of national power are essential to waging war.

Maoist Military Thought

Mao wrote on every aspect of the military; philosophy, organisation, logistics, the importance of man in warfare, the relationship between the army and the society, between the party and the army, and so forth. Yet Mao was never attracted to the military profession. His introduction to warfare and armed struggle came when he concluded that it was the only way to respond to the repress-
In every battle, concentrate an attack on or to precede the defensive, and detailed preparation. These are:

- Attack the dispersed isolated enemy forces and attack the concentrated strong enemy forces later.
- Take small and medium cities as well as large and detail preparation. These are:
- Advanced destruction of enemy through concentration of forces. "Active Defence" is learnt through two decades of his experience. This is considered vital for optimising contributions to both offensive and defensive operations, and particularly critical to success in "local wars". China is developing new, technologically advanced equipment, using a "learn by fire" approach. This calls for appropriate responses. Cyber threats are emerging as a major source of worry. Cyber and information warfare could qualitatively change the concept of a battlefield. Nuclear proliferation and nuclear security remain a serious threat in our neighborhood. The unfortunate fact remains that in these fields too we are worse than our adversaries. China is far ahead in information and offensive aspects of cyber warfare while Pakistan can boast of a better cyber warfare capability. The Indian Navy and Indian Air Force may be on the modernisation track, albeit much slower than the Chinese Navy and the People's Liberation Army Air Force. According to the document, the modernisation of China's armed forces is focused on several strategic areas. "China is stepping up the composite development of mechanisation and informatisation," it says. "China is working to develop the rail modernisation and the nuclear military aspects, people, military training in conjunction with informationisation and building a modern logistics system."
Active Protection System

Armour protection has substantially improved in the recent years. Tanks, earlier made of steel plates, are now protected by more complex composite armour, a sandwich of various alloys and ceramics. Composite and hybrid armour systems have been adopted for tanks by improving their protection against kinetic and shaped-charge threats.

Non-Explosive Reactive Armour: A new type of non-explosive reactive armour, known as NeRA has evolved. This uses “energetic” but non-detonating rubber-like materials. Sandwiched between hard plates, they discharge a rapidly expanding gas to absorb energy from a warhead. The gas pushes out the external layer of armour so that it strikes the spike at an angle which deflects or reduces the energy of the impact. Non-explosive reactive armour typically provide less stopping power, but they have an advantage in countering “tandem charge” munitions from systems like the US shoulder-launched Javelin and aircraft-launched Hellfire missiles. Once a brick of explosive armour detonates, that spot becomes more vulnerable to a second charge carried towards the tail end of the same munition and detonates about 500 microseconds later. In contrast, rubbery non-explosive armour remains partially intact. Cage armour can provide additional protection against tandem charge. To counter Russia’s RPG-29, some European Union countries are developing electric armour but it is still in a very early stage of development. Some new materials like hard ceramic composites have been developed made from rubber and epoxy resins. A ceramic armour called Dorchester Level 2, used on British Challenger 2 tanks, reportedly provides three times more resistance to some strikes as the same weight of steel. SJH Projects, a small British company, has developed a so-called “stone sponge” material which is fixed to a vehicle’s undercarriage and partially absorbs the blast off an improvised explosive device.

There is continuous competition between developments in AFV technology and AFV destruction technology. According to the official report of the Merkava MK4, the Merkava Mk4 has a built-in reactive armour, which requires only a quarter of the amount of protection but it reacts comparatively faster. However, the underlying danger is that its faster-reacting, more-sensitive explosives might detonate accidentally if hit by a bullet or another vehicle.

**Trophy Active Protection System (APS)**: The APS is the result of a 10-year collaborative development programme between Rafael Armament Development Authority and Israel Aircraft Industries/Elta Rafael is the prime contractor for the programme. The Trophy system can detect, classify, track and destroy all types of advanced anti-armour threats, including anti-tank guided missiles and rockets at a suitable distance away from the targeted AFV platform. In certain situations, it can destroy the anti-tank munition without detonation thus leaving no residual effect on the platform. The system comprises of a sensor and a hard kill mechanism. The sensor is an Ilia radar connected to four antennas located on all the four sides of the AFV thus providing all round protection including top attack. The hard kill part consists of two elements developed by Rafael which are located on either side of the platform. The Trophy radar carries out a search and on detecting the threat carries out threat analysis. It will start tracking the threat only if it is going to hit the AFV. The hard kill countermeasure is then activated to neutralise the threat at a safe distance from the platform to cause minimal collateral damage. This is an important requirement and as per the company, the maximum injury it will cause to the displaced personnel will be less than one per cent. Its integration is being carried out by the Merkava MK4’s Active Protection System where it can react itself or pass the information to another AFV which is threatened. The sensor can also be fitted to a variety of AFV platforms. Efforts are on to reduce the weight to make it suitable for lighter platforms like the Stryker. Weight is also an important characteristic and so such ‘add on’ systems do not impinge on the manoeuvrability of the AFVs.

Other Developments in APS: An APS has been under development in the US named Integrated Army Active Protection System. United Defence Land Platforms and RAE Systems of the UK are developing the sensor systems, and Northrop Grumman is developing the hard kill component. Integrator is another active-protection system which has been developed for US forces by Artis. It uses radar and optical sensors to calculate the trajectory of an incoming warhead, and then intercepts it with a projectile fired from a roof-rack. The impact then breaks up the warhead before it hits the AFV.

Russia’s Koltunova-based Engineering Design Bureau (KIB) together with other allied enterprises have designed and produced the Arena tank active protection system which belongs to the latest generation of Russian AFVs, together with Drakon-2 APS. Arena is intended to protect tanks from anti-tank grenades and ATGMs, including some variants of top-attack ATGMs.
ATK’s family of medium caliber chain guns combine combat-proven features and design simplicity resulting in lethality overmatch in defense current and future threats. With more than 14,000 systems in theater worldwide, ATK’s integrated weapon systems have become the industry standard for accuracy, reliability and flexibility to support air, ground and naval platforms. This is ATK.
‘Trophy is not an add on system’

Rafael’s Trophy active protection system is type classified, combat proven and works under all weather conditions. In an interview with *SP’s Land Forces*, Lova Drori, Executive Vice President, Rafael, threw light on the Trophy countermeasure technology.

**SP’s: What is the concept of the active protection system? Why has it been invented?**

Lova Drori (Drori): Trophy’s countermeasure is based on direct hit of multiple explosive formed penetrators (MEFP) at the threat’s warhead, causing disintegration of the warhead from the missile and in most cases without missile detonation. It was invented since the Israeli Defense Forces (IDF) concluded that there is no other way or technology to protect a combat vehicle 360 degree against chemical energy (CE) threats.

**SP’s: How is target detection and tracking done in an active protection system?**

Drori: Trophy uses radar technology (four antennas to cover 360 degrees) to detect and track the coming threat. Trophy countermeasure will be activated only if the threat is about to hit the protected vehicle and the radar delivers to the crew an exact location of missile launcher.

**SP’s: Is the system automatic when it is switched on?**

Drori: Yes.

**SP’s: Is the whole vehicle (tank or infantry combat vehicle) protected or only selected portions are protected?**

Drori: The whole vehicle is protected while enabling the vehicle’s commander to neutralise a selected sector.

**SP’s: Is it applicable round the clock in all weather conditions? Is the vehicle protected when the engine is switched off?**

Drori: Yes. Trophy APS is type classified and combat proven. It works under all weather conditions as well as when the vehicle’s engine is switched off.

**SP’s: What is the danger for the accompanying infantry who are outside the tank or ICV?**

Drori: Since the Trophy is activated only if the threat is about to hit the vehicle, it hits directly the coming missile’s warheads and in most cases will not cause threat detonation—the danger to accompanying infantry is minimal and in any case—much less than if the missile will hit the vehicle.

**SP’s: What kind of design does this equipment have? Is it an “add on” equipment and detachable?**

Drori: Trophy is not an “add on” system. However, it can be integrated to almost any medium (16 tonne) or heavy weight vehicle.

**SP’s: What are the advantages offered by your Trophy system versus the Arena or the Shtora system of Russia?**

Drori: Shtora is a soft kill system that is capable of defeating relatively small number of missiles and cannot defeat anti-tank rockets (ATR/RPG) at all. Arena will not cover 360 degrees and has a lot of collateral damage.

**SP’s: Does the system take care of flat as well as inclined trajectory attacks?**

Drori: Trophy will kill all the above mentioned threats, including very short-range shooting.
The First Battalion of the Indian Army’s Parachute Regiment celebrated its Raising Day on October 17.

Change of name did not however change the identity of the unit as the battalion fought from honour to honour—10 Battle Honours and eight Theatre Honours even as Colours changed over the years (see Box).

In the first 60 years, the battalion fought with Hyder Ali of Mysore, Tipu Sultan, the Marathas and the French in the battles of Coimbatore, Seringapatnam, Pondicherry, Mehidpur and Assenghur that were great victories for the British. Later, it sailed and saw active service in Ceylon in 1795. In 1824, the battalion participated in the First Anglo-Burmese War, winning battle honour Ava and earning the badge of Galley with the motto Khushki-wuh-tarri (by land and sea). Thereafter, it operated thrice in Burma, also serving in Penang, Malacca and Singapore. In 1903, the composition of the unit was altered to Punjabis, the designation changed to 67th Punjabis and the new century was heralded by marching 1,750 kilometres to Fort Lockhart and vigorous campaigns in World War I, the battalion fought the siege of Kut-al-Amara and fierce battles against Turks at Tukse Marh, Shumran, Tigris, Qisil Robat, Kudarrah and Nasiriyah. Later, it saw service in Salonica, Batum, Tiflis and Chanak before returning to India in 1920, having earned battle honour of Kut-al-Amara and Theatre Honour of Mesopotamia and winning 65 gal-
The BMS will provide the Indian Army an integration tool supporting every level of military users ranging from individual soldier to Battalion Group/Combat Group Commander in the tactical battle area displaying in near real time an appropriate, common and comprehensive tactical picture by integrating inputs from all elements of the battle group.

- LT GENERAL (RETD) P.C. KATROCH

The Indian Army acquiring Battle Management System (BMS) inch a bit closer with the Defence Acquisition Council (DAC) clearing the BMS proposal as a ‘make’ project. Since future military operations will be combined and joint comprising of all arms and inter-service elements, the requirement will be of units and subunits of other arms to operate subordinated or in cooperation with each other, accelerated decision-action cycle and an ability to conduct operations simultaneously within an all arms group. The BMS will provide the Indian Army an integration tool supporting every level of military users ranging from individual soldier to Battalion Group/Combat Group Commander in the tactical battle area (TBA) displaying in near real time an appropriate, common and comprehensive tactical picture by integrating inputs from all elements of the battle group.

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- THE INDIAN ARMY ACQUIRING BMS

The BMS was envisaged to enable a faster decision process by commanders at all echelons, enable better decision due to reliable operational information provided in real-time and have the ability to quickly close the sensor to shooter loop. The overall scope of the system is to integrate, test and field a BMS duly integrated with other components of the Tac2IL the system customised to the special Indian Army requirement, needs to be first integrated and tested in a controlled environment for which a test bed laboratory will need to be established. After testing at the laboratory conditions, validation trials of the system will be carried out in field conditions. After successful validation of the system in field, the process for equipping will begin. The mission capabilities being looked at are as follows:

- Provide a command and control system spanning the TBA spreading across individuals, detachments, combat platforms, sensors, subunits, units to the Battalion Commander/Regiment Commander.
- Achieve faster reaction capability and higher level command and control by providing information automatically at the right place in the right time, thereby ensuring better observe, orient, decide, and act (OODA) loop.
- Provide a strong foundation for making decisions based on near real time, consistent and well-structured information, thereby enhancing the information handling capability of commanders at all levels.
- Strengthen information exchange by having a strong messaging and replica mechanism.
- Improve and modernise presentation of information in near real time.
- Integrate with other command and control system.
- The BMS will comprise a tactical hand
ABSOLUTE CONFIDENCE.

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Inadequacy in understanding the technology at the top echelons is a real problem that the Indian Army must look at seriously.

The BMS has been cleared as a ‘make’ project by the DAC. The DG Acquisition will now order constitution of an IPMT to undertake a study, following which an expression of interest will be issued by the MoD to the industry for Phase I (establishment of the test bed lab and field trials at test bed location of one Combat Group and three Infantry Battalion Groups by 2022) and upgradation of systems (change management) from 2022 to 2025 and required standard and found wanting; the project will then go through the DRDO way, delaying the overall project by yet another few years.

The Army will be Reality for Phase III of F-InSAS (dealing with field surveillance system (bSS), electronic warfare system (eWS), etc.) to integrate the BMS and F-InSAS, the Army needs to work out a comprehensive training package for these personnel. Considering the numbers involved, such collective training will perhaps need to be centralised at Brigade/Battalion level.

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Transform National Security Apparatus

The need to bring intelligence and geospatial information under the aegis of one single agency cannot be underestimated and should not be relegated to a later day. India must reach a base level to match its status as a regional power.

LT GENERAL (RETD) P.C. KATOCH

The security, economic progress and well-being of the citizens of a country is closely interlinked with what intelligence gathering capability the country’s establishment has. Intelligence plays a prominent role in the decision-making process of any organisation including the military and such geospatial intelligence is vital to the command, control, communication, computers, information, intelligence, (C4I2) system. The technological revolution particularly in the field of information technology and 21st century challenges to security including expanding threat of international terrorism has forced governments’ world over to adopt organisational restructuring to cope with such threats. The emphasis is on state to state cooperation and exchange of information rather than pursuing an independent agenda since these threats are transnational, omni-present and can occur any time. The geographic database is vast; no more restricted to areas adjoining international boundaries and also includes own territory. Therefore, the amount of information that needs to be processed to filter meaningful intelligence is colossal. This makes exploitation of technology essential in order to facilitate real time intelligence. Conventional approach will not do since it will be time taking and resource consuming. Automated decision support systems can process and form a cohesive picture from large amount of data in fairly short span of time, thereby permitting retention of initiative. The aim of any such system should therefore be to fuse data from multiple and sometimes even unrelated sources to be able to produce a comprehensive intelligence picture dealing with all aspects of information.

Geospatial Intelligence

There are many definitions for geospatial intelligence. However, the most apt definition depicting the magnitude of the effort required to build a database of geospatial intelligence is by the National Imagery and Mapping Agency (NIMA), which defines it as “the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the earth.” This elucidates the type of database required by government agencies entrusted with the task of national security. The need for commanders at all levels to have access to maximum data pertaining to the topography and demography of an area of interest is well established. Transparent overlays with supplementary information placed over printed topography sheets have been in use for long and are just one example of this necessity. Computers and associated technology have ushered in the era of digital mapping where this supplementary data can be tagged to various terrain features, which can be displayed, queried or processed, based on the requirement without cluttering the base map.

The capability and capacity of any application based on a geographic information system (GIS) is dependent on the quantity and quality of data provided as input. A digitised cartography map needs enormous volume of attributed data before it can become suitable as a GIS input. While generally this data has been assumed to pertain to terrain feature only, a true GIS ready map should logically cover the complete spectrum of data required by various disciplines of geodetic science that has military value in assisting the operations. This definitely calls for inputs even from agencies other than those dealing with topographic survey in order to make it all encompassing. For example, it should assist in calculating the effects of certain type of munitions like incendiary, chemical or biological that cannot be calculated purely by use of standard two-dimensional models since it also requires detailed knowledge of terrain in terms of type of forest condition of the shrubs and meteorological conditions, etc.

Infrastructure

To reinforce the above, the security forces will need to rely on all relevant agencies of the government in order to optimally exploit the available information in a geographic context. Stand-alone reliance can leave large gaps in intelligence which would be crucial at the time of critical decision-making. It is therefore essential that any agency entrusted with the task of producing geospatial intelligence should be multi-faceted with representation from all agencies dealing with aspects of intelligence, cartography, oceanography, civic infrastructure creation, public utility/safety services and so on. Cartography in an urban environment is a challenging task since there is lack of natural features that can be selected as control points plus the problem of line of sight for surveying. The requirements of user, especially security forces, are also very demanding in an urban setup. Layout of the sewage system, the power and telephone lines/distributors, other communication infrastructure, traffic conditions at various time of the day, location of medical and health centres, the demography, location of trouble spots, ethnic/communal break up of population, architectural drawings of the buildings, etc are the disparate sources of information which can enable a commander in taking logical decisions in case of a crisis.
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Post-9/11, the US undertook major restructuring of government agencies and formation of National Geospatial Intelligence Agency (NGA) by merging in it with elements of the Central Intelligence Agency (ClA), Defence Intelligence Agency, National Reconnaissance Organisation (NRO), State Department, etc. The NGA’s mission statement being “provide accurate and timely geodetic, geophysical, geotechnical analysis and geospatial intelligence information to support national security, department of defence, and intelligence objectives,” is undoubtedly a major arm of the US Government assisting in implementing the national goals of USA. Other major nations too are restructuring to establish agencies dealing with this important aspect of intelligence. One may argue that USA is a global power and requires much larger database of spatial intelligence to support its foreign policies and its military deployed at various parts of the globe. While we may not draw comparisons with the US in terms of infrastructure at this stage, we will surely have to reach a bare minimum level to match our status as an emerging regional power in the Indian Ocean Region (IOR). For production and analysis of data, required as base for geospatial intelligence, numerous agencies are involved. This would include high resolution imagery products, elevation data through ground/air/space based survey, electronic intelligence (ELINT) and human intelligence (HUMINT) assets, cartography data, inputs from agencies dealing with internal security, urban and rural development agencies, forest management agencies, intelligence community and so on. It is only when the seemingly unrelated events collected individually by various agencies are merged, a comprehensive intelligence picture in the geographic domain can emerge.

Indian Scene
On the Indian front, establishment of the National Spatial Data Infrastructure (NSDI) has been a good initiative but its networking with concerned government agencies relevant to geospatial database and updates is going too slow and may take many years unless the right impetus is given. More importantly, NSDI deals with only some aspects pertaining to creation of metadata of available geospatial data and does not cater to inputs from intelligence community or for that matter the defence services. In spite of the recommendations of the Kargil Review Committee (KRC) as well as recommendation of Group of Ministers (GoM) on issues related to streamlining the intelligence agencies in the country, a lot of work is yet to be done on issues related to fusion of intelligence data. While the Defence Intelligence Agency (DIA) and National Technical Research Organisation (NCTR) have been established, such steps are still not sufficient to deal with aspects pertaining to geopolitical intelligence. The DIA is the central repository for all intelligence inputs pertaining to the three Services including imagery intelligence (IMINT) and electronic intelligence (ELINT). However, we are yet to integrate the aspects of topography with the DIA. Within the existing setup, adequate resources in terms of remote sensing, ELINT payloads and cartography are not available to produce high quality fused data. Similarly, much more is required at the national level in terms of integration of various government agencies. While certain isolated linkages between certain government agencies are already in place, this connectivity has to be extended to all necessary arms of the government over a national security information grid for optimal exploitation of various multilayered data sets. Ideally, a comprehensive geospatial intelligence data set should be able to generate large scale maps, surface structure/buildings, computer models to predict and manage natural disasters and many other functions required to support aspects pertaining to nation building as well as national security.

The Disaster Management Authority (DMA) by itself is recognition of the importance of geospatial science in nation building. An organisation like this would have to deal with varied amount of data pertaining to disparate sources of information to perform its tasks. A National Information Grid is a basic prerequisite for the collection and assimilation of data coming from different parts of the country, dealing with different aspects of national security. Our existing communication infrastructure is definitely not in a position to deal with information flow of the magnitude necessitated by disasters like the Tsunami and recent calamities in Leh, Sikkim and West Bengal. Our National Information Grid (NATGRID) has already been cleared by the Cabinet Committee of Security (CCS). This needs to be established on priority, synergising ‘all source’ intelligence and should also be linked to the National Special Data Infrastructure (NSDI). Be it disaster management, communal riots or counter-insurgency operations, the disparate information held by different agencies has to be fused to form an intelligent picture before the operations can be planned to produce maximum results. Within the military, the primary requirement would be the timely inputs from the three services pertaining to the defence part of the national security apparatus while it will take time to influence a smoother flow of information from other arms of the government. The military itself must focus on integration of various sources of information belonging to the three Services under the aegis of Integrated Defence Staff (IDS).

In the absence of a dedicated defence space programme, the military is dependent on two National Remote Sensing Agency (NRSA) and commercial satellite based imagery for some of the IMINT requirements. There is a need to employ other alternate sensors to meet the defence requirements not only pertaining to imagery, but also pertaining to data required for cartography. This calls for a well coordinated surveillance effort by airborne sensors of the three Services. Similarly, the HUMINT and ELINT data needs to be fused with IMINT and the topographic data. Military survey needs a large amount of data to produce accurate maps of areas across the IB/LAC/LC. Unless we can task our assets according to the overall vision for geospatial intelligence, we will continue to operate in isolation, and remain critically short in terms of geospatial data. There is a need to chalk out a well thought out roadmap in this context.

Requirement
The following needs to be focused by the government and the military, as relevant:

- **Data links of NSDI with concerned government agencies and the military need to be established on priority basis.**

  - Which government agencies need to be linked with NSDI and why? 
  - For which views could be taken from various forums including the Ministries of Home and Defence. Military Survey, Survey of India, Disaster Management Authority, NRSA, DOS, think tanks, etc.

- **NSDI must be networked with agencies like the DIA and NTRD.**

  - Establishment of NATGRID needs acceleration. Once established, it should be linked to the NSDI and DIA besides other agencies.

- **The military should focus on integrating topographical aspects with the DIA.**

  - The military survey needs a large amount of data to produce accurate maps of areas across the IB/LAC/LC. Unless we can task our assets according to the overall vision for geospatial intelligence, we will continue to operate in isolation, and remain critically short in terms of geospatial data. There is a need to chalk out a well thought out roadmap in this context.

**Meeting Future Challenges**

- **In times to come, as India gets increasingly involved in UN-backed conflict management activities, we will have to continuously review our policies and carry out organisational adaptations to operate seamlessly with other major member countries.**
The development of guns has almost reached a plateau in terms of reach but there has been revolutionary development in gun ammunition to meet the requirements of longer reach, lethality and accuracy. The modern gun ammunition can be used from land, sea or air, depending on the type of platform.

Medium Calibre Ammunition

Many companies are developing and manufacturing many types of state-of-the-art medium calibre ammunition to be used from land, sea and air.

ATK

ATK produces a complete family of medium calibre tactical and training ammunition which can be fired from Apache helicopters; A-10 Thunderbolt II aircraft, Bradley infantry fighting vehicles, ship self-defence and A-10 thunderbolt II aircraft, bradley infantry fighting vehicles, ship self-defence and ground suppression, air defence, and ship-based applications. AtK produces a complete family of medium calibre tactical and training ammunition which can be fired from Apache helicopters; A-10 Thunderbolt II aircraft, Bradley infantry fighting vehicles, ship self-defence and A-10 thunderbolt II aircraft, bradley infantry fighting vehicles, ship self-defence and ground suppression, air defence, and ship-based applications.

20mm x 102mm: ATK produces a full spectrum of 20mm x 102mm ammunition for air and defence. The system has been designed for armour piercing, anti-materiel and personnel role. The ammunition is lethal, has good penetration and is very accurate. It can be effectively used from fixed-wing aircraft for combat applications to support air-to-air and air-to-ground missions; rotary-wing applications for air-to-ground missions and against today’s modern littoral and anti-ship threats. This ammunition can also be used in a ground-based defence system to counter rocket, artillery and mortar attacks and against speeding cars loaded with explosives. The rounds can be fired from the M39A2, M61A1, M197 and M621 cannon.

The penetrator with enhanced lateral effect (PELE) round offers a superior fragmenting projectile without the use of high explosives. It is effective against air targets as well as against hard and semi-hard targets and is available in 25mm x 137, 30mm x 173 and as ballistically-matched practice ammunition.

Frangible armour piercing (FAP) ammunition: FAP is a new type of high-performance, explosive-free, multi-purpose ammunition for fighter planes and fighter-bombers. Each round is armed with a penetrator containing individual frangible heavy metal pellets and heavy metal sub-projectiles. After penetrating the target envelope, the heavy metal pellets disintegrate into multiple fragments. It is designated for ground and air-to-air engagements. The FAP multi-purpose round is available in calibre 20mm x 102mm x 1 and 25mm x 145.

Advanced hit efficiency and destruction (AHEAD) ammunition: The 35mm AHEAD-system consists of measurement and programming units, control electronics and programmable AHEAD ammunition. It can be fitted to any suitable weapon system and then successfully engage small fast aerial targets with a high kill probability. Each “AHEAD” round contains 152 tungsten sub-projectiles which are ejected immediately in front of the oncoming target. The measurement unit determines the velocity of each AHEAD round prior to muzzle exit. Based on this data, the control electronics calculates the penetration time of each projectile which is transmitted via the programming unit to the time fuse in the projectile.

Light Weight (LW) 30mm ammunition: LW30mm ammunition is ideal for helicopters, light ground vehicles and shipboard applications. The penetrator effective against armour piercing and anti-personnel roles. The projectile has proven penetration into the platform fire control unit; and the Abm ballistic algorithm integrated in the platform fire control unit determines the velocity of each projectile. LW30mm ammunition is ideal for helicopters, light ground vehicles and shipboard applications. The penetrator effective against armour piercing and anti-personnel roles. The projectile has proven penetration into the platform fire control unit; and the Abm ballistic algorithm integrated in the platform fire control unit determines the velocity of each projectile.
Sudarshan Shakti

Troops of the Southern Army have already reached the desert for their annual training exercises. This training will commence at the subunit and unit level and progress to formation level exercises to give a feel of actual command in the field to the commanders at each level and culminate in a major exercise in December 2011.

ExercIse Sudarshan ShaktI is being held in November-December 2011 to validate the operational preparedness of the Southern Army in a tri-service environment. More importantly, it will be based on the integrated theatre battle concept under the Southern Army Commander Lt General A.K. Singh with 21 Corps in the lead, supported by all other relevant elements of Southern Army.

Theatre Battle in Indian Context

The Army has underlined that the exercise is based on the concept of integrated theatre battle. What precisely does it mean? So far in the Indian Army, the highest level of tactical battle is planned and fought at the Corps level. A Strike Corps is the highest level field formation in the Indian Army which is capable of independently conducting offensive operations in the field. There is no fighting formation higher than the Corps. Hence an Army Commander (General Officer Commanding-in-Chief of a Regional Command) is loosely termed as a theatre commander because there are no integrated (tri-service/bi-service) theatres except the Andaman and Nicobar Command, which hardly has any troops at present.

An Army Command may have two or more Corps under it, but the army commander is not a field commander in the strict sense of the word. He does not get involved in tactical battles and generally places the theatre military strategy and evolves the operational art to be applied in a particular campaign at the theatre level and is therefore more concerned with the conversion of the Chiefs of Staff Directive into military aims and objectives within the command in order to achieve the political aims of war. The Army Commander gives out his intention, his military objectives, his vision of the campaign, and specifies the military end state of the campaign. He is more concerned with the allocation of resources to the Corps and the planning required to achieve the political and military objectives of war. In the Indian context, detailed planning and conduct of tactical battles to achieve the laid down military objectives is done by the commander of the Strike Corps in consultation with his subordinate commanders and staff. However, the Army commander keeps himself well informed of the planning and intervenes where necessary. During the conduct of battle, he keeps abreast of the progress of battle and intervenes when a situation so demands. Some situations which may demand his intervention include adjustment of boundaries of formations in the field as the battle progresses, change of command and control of subordinate formations due to changing tactical situations, and release of reserves of troops.

AlphaDog

Scientists from Boston have invented a dog-like robot, which can carry over 180 kg on its back over 30 km and on any kind of terrain. It uses computer vision and GPS to follow a leader, rather than any kind of terrain. It uses computer vision and state-of-the-art hydraulics.

AlphaDog can walk and trot over sharp rocks, though slowly. It will take the robot five months to develop and is schedule for launch in 2012.

AlphaDog does not need a driver; it follows along with troops, making use of its global positioning system (GPS), computer vision and state-of-the-art hydraulics.

AlphaDog is the offspring of BigDog, an earlier noisier version with limited payload and operating range.

While BigDog took on four legs articulated like an animal’s, AlphaDog has been designed to be over ten times quieter than BigDog. This quadruped has the same cargo carrying mission as BigDog, but with better range and payload.

Navistar’s new Saratoga light tactical armoured vehicle has been designed for superior survivability, mobility and transportability.
The unique feature of this exercise will be the jointmanship between the Southern Army and its counterparts in the IAF and the Indian Navy weaponry and logistics. Therefore, when the Army says that this Southern Command exercise is being planned on the basis of a theatre battle, it is far more than the mere phraseology that the media is proclaiming.

Aims of a Theatre Offensive
In any offensive operations planned on the subcontinent, the aim would either be to capture the territory or destroy enemy forces or a combination of both. Any territory captured across international boundary would invariably have to be returned though it could temporarily be used for post-conflict bargaining. The territory captured across disputed border like the line of control, may be retained though in the present global environment that would also not be realistic. Hence destruction of forces would be a more important objective which would have a long-term economic impact on the adversary.

Integrated Theatre Concept
For destruction of large armoured and mechanised forces, battles will have to be planned and orchestrated according to an integrated theatre plan so that larger forces comprising more than one strike corps can be employed synchronously from one theatre or from two different theatres to cause maximum destruction of enemy forces. This would imply that an Army Commander acting as a theatre commander would have to have a tactical headquarters fully staffed with the necessary communications to all strike and pivot formations of the Army in that region, and to the concerned Indian Air Force (IAF) Headquarters, which in this case would be either South Western Air Command (SWAC) or the Western Air Command (WAC), or elements of both air commands. The IAF will have to play a dominant role in the destruction of enemy mechanised and armoured forces on the battlefield and therefore joint planning will be essential. It is here that a truly integrated theatre would be very useful. The success in this battle will depend upon the synergy and close coordination achieved by the Army and the IAF, and inter-theatre (within the theatre) between the pivot and the strike corps of that theatre (command), or inter-theatre (inter-command) between the strike corps of two adjoining theatres of operations along with their IAF counterparts. The tactical headquarters of the Army would have to suitably locate itself to orchestrate and conduct the battle of destruction of enemy forces. If this is what is being planned in this exercise, then it would be the first time that a theatre battle concept is being physically tried out. However, wonder how useful it will be with only one command (Southern Army) on the ground. To derive maximum advantage and to bring realism in planning from such a large scale exercise, at least two command headquarters should have been positioned on the ground.

Coordination Philosophy
In view of the large number of Army and air formations and units involved and a very large variety of force multipliers that are likely to be employed, the coordination and conduct of overall campaign is of vital importance. We hope that the Deputy Chiefs of Integrated Defence Staff (DCIDS) (Operations) and (Training) of the Integrated Defence Staff and their subordinate staff officers, on behalf of the Chiefs of Staff Committee, are closely associated with this exercise to understand the requirements of synergy and coordination between the Army and the IAF which could then propel the joint training and planning in peacetime.

Conduct of Exercise
Troops of the Southern Army have already reached the desert for their annual training exercises. This training will commence at the subunit and unit level progressing to formation level exercises to give a feel of actual command in the field to the commanders at each level and culminate in a major exercise in December 2011. The exercise envisages innovative manoeuvres in a simulated battle environment, by composite combat entities, supported by air and complemented by a wide array of force multipliers and enabling logistics. The Southern Army is working towards a "capability based approach, based on a series of transformational initiatives spanning concepts, organisational structures and absorption of new age technologies, particularly in the fields of precision munitions, advance surveillance systems, space and network-centricity, under the overall guidance provided by the transformational study of the Indian Army.

The unique feature of this exercise will be the jointmanship between the Southern Army and its counterparts in the IAF and Indian Navy. The exercise will see this cooperation in earnest wherein, the inter-service operability will be tested and re-configured to suit the constantly changing operational requirements.

Leadership
It is heartening to see that the exercise is being conducted by Lt General A.K. Singh, who has been in command of the Mechanised Forces and has experience of commanding offensive formations throughout his career. He is hence the most suitable senior officer to plan and undertake offensive operations at the national level. He has already commanded 1 Armoured Division in the desert and has very successfully commanded 1 Corps (Strike) and was one of the main architects of the new "Transformational Study of the Indian Army", conducted by the current Army Chief when he was the GOC-in-C of Eastern Command at Kolkata.
Humvee from AM General became the ubiquitous HMMWV, and the mainstay of the US military during the mid-1980s as it became the ultimate high mobility platform. The US Army has since fielded over two lakh HmmWVs for the US and over 20 other countries. Am General has produced more than 65 combat and support systems on the HmmWV chassis and drivetrain. Over 65 combat and support vehicles have been fielded on the HmmWV, including the M1151, M1152, and M1165 variants, incorporating the highest levels of protection including frag kits, all field installable/removable. M1151s are armament carriers and M1152s are two-man vehicles that can be used as troop carriers/shelter carriers. The M1165 is a command and control vehicle with four-person seating capacity.

Revolutionary Design
Though in production for over 25 years, its design is still revolutionary today as it was when engineers began initial concepts way back in 1979. The final design met military requirements to replace numerous types of aged vehicles and to keep up with swift moving tanks. The Army wanted durability, mobility and reliability. The unique geometries of the truck provides these qualities. No other light tactical vehicle in the world approaches the HmmWV’s capabilities or cost-effectiveness. No wonder, AM General proudly announce, “We built the toughest truck in the world.”

That doesn’t mean today’s HmmWVs are the same as those first produced. The HmmWV is a dynamic vehicle with changes and improvements continually added. For instance, thorough corrosion resistance has been added and most components have been upgraded and now have a larger 6.5-litre diesel engine. Initially introduced with a 1-tonne payload capacity, it now can carry payloads up to 5,100 lbs and gross vehicle weight rating (GVW) up to 12,100 lbs. The workhorse now carries new sophisticated communications and weapons systems.

The HmmWV is a lightweight, highly mobile, diesel-powered, four-wheeldrive tactical vehicle that uses a common chassis to carry a wide variety of military hardware ranging from machine guns to tube-launched, optically tracked, wire command-guided anti-tank missile launchers. It has shown excellent performance in a wide variety of terrain, from deserts to jungles, for long durations with minimal maintenance.

Its 15 configurations (cargo/troop carrier, weapons carriers, ambulances and shelter carrier) share a common engine, chassis, and transmission, with 44 interchangeable parts that are used in more than one position. That means fewer training hours are necessary for the mechanics. Its simplified supply, maintenance and logistics system—essentially one set of common parts for 15 configurations—means lower life-cycle costs, which saves tax dollars. The HmmWV has a 16-inch ground clearance and it is an engineering feat considering that the vehicle stands only 72 inches high.

Wide Range of HmmWVs
The HmmWV models include A2 Series vehicles—M1097A2 (base platform); M1097A2 (cargo/troop carrier/prime mover); M1123 (cargo/troop carrier); M1097A2 (shelter carrier); M1052A2 (armament/TOW missile carrier basic armament); M1043A1J/1045A2 (armament/TOW missile carrier supplemental armour—44 grain); M997A2 (max-ambulance basic armour); and M1035A2 (soft top ambulance).
DSEi 2011 had the world’s largest display of land, sea and air applications of defence and security products and technologies, yet according to analysts there was nothing ‘revolutionary’. For the first time, the expo staged a number of high level briefings, which were held away from the show floor to provide an in-depth understanding of a variety of topics, including trauma care, defence offsets and cyber security.

Notable Presentations

**General Dynamics showcases Scout-SV prototype:** General Dynamics showcased its Scout-SV representative prototype for the first time, developed as part of a £500 million contract from the UK Ministry of Defence issued in July 2010. It is one of a number of vehicles being developed to de-risk the programme prior to the delivery of the first of seven prototype vehicles in 15 months. The prototype unveiled is one of the two test bed vehicles and features the Lockheed Martin UK experimental demonstration unit (EDU) turret fitted with CTAI Cased Telescoped (CT40) 40mm cannon.

**Giffen Hoverwork’s Griffon Hovercraft:** Also on display was General Dynamics European Land Systems’ medium trackway bridge (MTB). It has been designed to be easily transported and launched from any vehicle with a weight of above four tonnes, which covers most of the tactical vehicles currently deployed.

**BAE’s invisibility cloak:** BAE Systems presented Adaptiv ‘invisibility cloak’, which uses a series of hex-shaped computer-controlled semiconductor heat-shink tiles to hide and disguise the thermal image of military assets, surveillance platforms which remain stable throughout operational manoeuvres. Equipped with enhanced thermal imaging, navigation and communications tools, the hovercraft travels with ease over shallow water, rapids and rivers, vegetation, ice and even snow.

**Northrop Grumman’s UAV data management system:** Northrop Grumman introduced an unmanned air vehicle data management system to the European market, to allow troops on the ground to “eliminate the tunnel vision of the battlefield”. Called the heterogenous airborne reconaissance specialist company Photonic Security Systems recently announced a new strategic partnership which will deliver the world’s first scenario-based programme of indoor unmanned systems demonstrations. The first such scenario, a “Foot patrol in Afghanistan” was unveiled at DSEI, demonstrating the integration and interoperability of numerous unmanned ground and airborne systems with force patrol operations in support, surveillance and protection roles through a “real world” scenario.

**QinetiQ and Dytecna also announced a memorandum of understanding (MoU) that will see two leading experts from the defence and security industry pursue shared product development opportunities relating to force protection.**

**Photonic launches pirate defence system:** United Kingdom based marine security specialist company Photonic Security Systems (PSS) launched a new proactive pirate defence system, the LJS100, earlier this month. The LJS100 acts in what is said to be a non-lethal and humane manner and is based on a proactive method to prevent pirates from approaching a ship.
The system works by sending a 10 metre wide multi-band laser light beam, up to a distance of one kilometre to dazzle potential intruders and disable them from locating and boarding the ship. This newly developed alternative is expected to prevent pirates boarding merchant ships. It is said to make it very difficult to be destroyed by the intruder. The product’s inventors/designers believe that this is a key to its success. The standard LD100 incorporates a twin laser system, with the command centre mounted inside the bridge. Laser optics is mounted on swivelling and tilting, tracking cameras on brackets on each side of the vessel, to enable it to track incoming craft.

Aero Sekur launches stealth poncho: Aero Sekur showcased a stealth poncho designed to reduce the IR and radar signature of the wearer. The poncho is part of a new military clothing range designed and manufactured by Aero Sekur for the Italian future soldier project. The poncho is designed to virtually eliminate the heat signature of the soldier wearing it. Produced out of a combination of several different fabrics, the poncho can be quickly deployed and secured. It is designed and manufactured by Aero Sekur, and is an open, multi-mission system that provides an interoperable environment. The SkyStar is to be integrated and manufactured by Selex Galileo Seaparay radar in a Predator UAV provided by General Atomics. FTI Electronic Systems launched a tactical radio system at the expo adding IF capability to its existing Spearhead VHF range. It has also developed a new non-snoopy system that reduces environmental impact and lifecycle costs.

Thales showcased its integrated CBRNe Assessment System (iCAS), a modular and tailorable detection and monitoring system that can rapidly assess CBRNe incidents and provide key information to emergency responders. At DBU, three radio sets from Ebit Systems were launched, which included Tadiran GrX-4000, Tadiran PNR-1000A and the Tadiran GRX-4000. The other Elbit Systems products on display were meprolight’s mepro m5, the company’s advanced line of operationally proven combat optics for light weapons; and Brazil’s Embraer Defesa e Segurança’s BR700. Among other products on display were meprolight’s mepro m5, the company’s advanced line of operationally proven combat optics for light weapons; and Brazil’s Embraer Defesa e Segurança’s BR700.

At the expo, Cassidian announced that it has made a breakthrough through development of the world’s first truly secure wireless data mobile Internet protocol technology. The technology has been designed to improve the ability of military and emergency response services to maintain secure communications.

Successful Show

As mentioned, the four-day exhibition had many novelties, but there was no show-stopper. However, it was not without its share of controversy. The organisers had to close down Beechwood Equipment’s stand after literature showing equipment banned under UK Government export controls and our own contractual requirements was found on display. DSEi Exhibition Director Duncan Reid said, “First and foremost I’d like to thank all our exhibitors—they helped to make the show a major success. We invested significantly in this year’s event. We introduced new features such as the robotics and communications zones. As mentioned, the four-day exhibition had many novelties, but there was no show-stopper. However, it was not without its share of controversy. The organisers had to close down Beechwood Equipment’s stand after literature showing equipment banned under UK Government export controls and our own contractual requirements was found on display. DSEi Exhibition Director Duncan Reid said, “First and foremost I’d like to thank all our exhibitors—they helped to make the show a major success. We invested significantly in this year’s event. We introduced new features such as the robotics and communications zones. Among other products on display were Meprolight’s Mepro M5, the company’s advanced line of operationally proven combat optics for light weapons; and OSHM, a lightweight, uncooled thermal weapons sight. Swissland-based Velttronix launched its newest portable laser rangefinder (PLRF family) in the Swiss Pavilion. Survitec launched a new modular attack helicopter aircrew life preserver.

At the expo, Cassidian announced that it has made a breakthrough through development of the world’s first truly secure wireless data mobile Internet protocol technology. The technology has been designed to improve the ability of military and emergency response services to maintain secure communications.

Agastra/Westland’s AW159 Lynx Wildcat came to the expo for the first time. The helicopter is likely to be fully operational in 2014. The expo also had the assisted carriage system (ACS) developed by John Deere and BAE Systems. The Meerkat super light tracked vehicle, developed at OVIK and shown for the first time.
‘At the core of our international business is Defence Weapons Systems and the Security Sector, including Special Operations Forces’

In the backdrop of Defence Security and Equipment International (DSEI) exhibition in London, Jayant Baranwal, Editor-in-Chief, SP’s Land Forces, had a tête-à-tête with Tom O’Sullivan, International Sales Manager, ATK Security and Sporting Tactical Systems; Roger O’Dell, Director, Technology and Advanced Programmes, ATK Armament Systems Integrated Weapons Systems; and Amanda Covington, Director of Communications, ATK Armament Systems on ATK’s varied weapon systems. Excerpts of the interview:

Jayant Baranwal (SP’s): Can you elaborate on ATK’s future infantry combat vehicle (FICV) products?
Roger O’Dell (Roger): With regard to the future infantry combat vehicle (FICV), ATK is offering its medium-calibre cannon, the MK44. The MK44 is placed with various vendors who are competing with combat vehicles. The 30mm MK44 will also be present at the Defexpo show next year. In addition to FICV, ATK has navy opportunities, for 30mm guns and system and remote weapon systems (RWS). ATK is also the world’s largest manufacturer of small caliber ammunition, including the 9mm and 5.56mm.

SP’s: Is ATK open to technology transfer?
Roger: Everything is subject to US Government approval, but the company is inclined. We have indicated to our partners for to offer FICV medium-calibre cannon system.

Tom: Finally, on the Special Forces side, we have had interest in ammunition and products from ATK brands such as Black Hawk. This includes Special Forces equipment like tactical accessories, such as vests, holsters, etc. Those are the broad areas that ATK is known for in India.

Amanda Covington: ATK is also known for precision-guided weapons. We have developed precision guidance kits for mortars and artillery. GPS technology increases accuracy on the scale that we can do that.

SP’s: Tell us about Black Hawk and your India focus?
Tom: Black Hawk was founded in 1994. It is about 17 years now and about nine years back the company was diversified. For India the focus is on Special Forces and not so much on law enforcement, primarily because ATK is not the L1 supplier.

SP’s: But India is no more looking at L1. We have the example of medium multi-role combat aircraft (MMRCA), India is going for say L3 or L4.
Tom: India has a unique budget, unique requirements, and we have unique products that are proven in combat. We have found it over the years that it is a fairly easy choice so that they can buy more products at lower price. The second step in our process is conventional forces, the military and armed forces.

SP’s: Which are the countries using your programmes?
Tom: Our products are used in more than 80 countries including the Special Forces of UK, US, France, etc. India is next. ATK also owns Eagle Industries, which has very high-quality, made-in-the-USA products. Those items can also be made and sold in the Indian Special Forces have a special need in terms of custom design. We offer a wide range of choices.

SP’s: And if it has to be customised, is it going to cost more?
Tom: It depends on the situation and in some cases it has been customised based on the customers’ needs and we have such economical scale that we can do that.

SP’s: Has any presentation been made to the Indian Special Forces?
Tom: No, but we are looking ahead to demonstrate our products at Defexpo.

SP’s: Can you throw light on ATK’s weapons systems and guns?
Roger: The medium-calibre system side of our business covers everything—from the 7.62mm Bushmaster cannon to the Bushmaster III, 55mm. The Bushmaster series of cannons was originated in the 1960s from a military contract with the government that led to the flagship product that is the M242. The MK44 was a derivative of the M242. It started out as the Bushmaster 2. It is a premier medium caliber cannon system with the 30mm x 17 inmm caliber, which is combat proven, extremely powerful, expands the range of fire, keeps engaging the target, and it is extremely reliable. The other advantage ATK brings is that we also make the accompanying ammunition. This helps us leverage the ammunition designers and the gun designers, who work side by side, to make the system optimal for the end user. This is what we bring to the FICV competition, in terms of validity and the capability that the system offers.

Our M2 30LF (link fed) cannon is built upon our success with our M2 30, which is the cannon used on the Apache 64 helicopter. The M2 30LF is a link-fed variant of the proven M2 30. Now we are offering the gun systems to naval and ground platforms which hadn’t been done in the past. To take it a step further, we developed our own remote weapon system that take advantage of the gun with the ammunition, put in the package that gives end users the ability to bring 30mm capability in place of the 7.62mm or 12.7mm caliber gun. It is a game changer in terms of what the warfighter can do, what the platform can do, and instantly up-gunning any platform. We do it with essentially the same logistics and cost profile for the same legacy weapons, both against both of them with different threats and different capability, strategy, but equally successful.

SP’s: Have you tried to study the potentials with some of the serial systems, like light combat helicopter (LCH) and advanced light helicopter (ALH)?
Roger: On the air side, ATK has developed a precision air-to-ground weapon called the Guided Advanced Tactical Rocket (GATR). We have demonstrated success with GATR on both Kiowa and Blackhawk helicopters. It has applications for rotary-wing and fixed-wing aircraft, with lock on before or after launch capabilities.

SP’s: But India is certainly looking at Chinooks in immediate terms, if not Apache which could be acquired a little later.
Roger: We do have the MK44 on the AC-130 gunship of the US Air Force.

SP’s: Do you have any involvement with the C-30J programme?
Roger: Yes, ATK has sensors on that.

SP’s: When you speak about the FICV programme, which all entities you are in touch with in India?
Roger: We are in touch with several companies.

SP’s: ATK seems to have a huge range of solutions.
Roger: Yes, everything used by a soldier from his outfit to his boots, up to the gun systems.

SP’s: You have created micro-solutions.
Roger: Yes, we were looking at the mandate for the next year. Defexpo is a major event. We will also be at other stands, for example L&T, Mahindra, etc. ATK apart from having its own booth will have systems on other Indian stands as well.

Tom: We are also considering doing a Special Forces demonstration around that time, though we have not worked out on the details. ATK offers a broad portfolio of products that supports a variety of platforms, from the soldier to land, air and applications.
Oshkosh Defense is the pioneer in developing vehicles to support and protect the men and women who risk their lives for the nation. In an interview with SP’s Land Forces, at the Defence Security and Equipment International (DSEI) exhibition in London, Martin Brethouwer, Manager, Middle East Programmes, Oshkosh Defense laid out the company’s plans for Indian market.

Jayant Baranwal (SP’s): As wars are becoming increasingly asymmetric, how has Oshkosh Defence strategised its products to fight such threats and how adaptable are these military products for homeland security?

Martin: Till 2004, Oshkosh did not ever produce any armoured vehicles or vehicles capable of carrying armour. Since 2004, all of our vehicles are armoured. So every tactical vehicle that we build is either built with armour or has the capability to be easily armoured. As is the case of our tactical vehicles like MTV and heavy expanded mobility tactical truck (HEMTT), the vehicle does not carry the actual weight of the armour. But there is provision for attachment of the armour later. The vehicles have greater protection level and the capability of being updated with new armoured technology. We also have the MRAP All-Terrain Vehicle (M-ATV). We use both our armoured technology which is not the case with most of our competitors, and the armoured configuration in our vehicles can also be easily changed. So in a homeland security role, you can add the armour to a logistic vehicle and can change the protection level.

SP’s: Are they adaptable to homeland security requirements as well?

Martin: Absolutely, for example the M-ATV product line is designed for the homeland security role. It is based on a commercial chassis, is less expensive and the vehicles are designed primarily for the armed forces.

SP’s: What kind of successes you have had in markets outside the United States?

Martin: We have had lots of success. It is difficult to give the exact number. Our vehicles are used in Thailand, Taiwan, Middle East, South Korea, UK, etc. Our vehicles are recognised as high quality, high mobility vehicles built on true military specifications.

SP’s: How are your vehicles different and better compared to others?

Martin: There are many companies which build vehicles, but there are only a few who built vehicles specifically for the military. Oshkosh Defense has not built any commercial vehicle. All our vehicles are built for purely military applications. We promise the end user that it will have a usable life span of at least 20 years. Our vehicles are used all over the world and so we have the capability to survive and thrive in those environments. In India, there are requirements for light armoured vehicles. There is also a wide spectrum of requirements in logistics. The vehicles are designed for varied temperature and terrain.

SP’s: Some companies talk about scalability. Are your vehicles scalable?

Martin: Absolutely, for example the MTV product line is designed for the homeland security role. We use both our armoured technology which is not the case with most of our competitors, and the armoured configuration in our vehicles can also be easily changed. So in a homeland security role, you can add the armour to a logistic vehicle and can change the protection level.

SP’s: There will be a lot of scope in India. Army has huge requirements in logistics, infantry and armoured requirements. In addition to that is the homeland security market.

Martin: We are actively investigating the opportunities in India. Oshkosh is definitely interested in the Indian market. We are looking for partners in India too.

SP’s: Any dialogue so far with potential partners?

Martin: We have preliminary meetings with the end user and had several contacts with the industry and the end user.

SP’s: There is also a growing need for not just all-terrain vehicles but also vehicles which are designed to give troops protection. Can you outline the features of your products in this context?

Martin: We have logistic vehicles, light armoured vehicles, tractors, recovery vehicles. Every tactical vehicle Oshkosh makes is designed with the capability for troop protection.

SP’s: What kind of successes you have had in markets outside the United States?

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The M998 A2 series has a curb weight of approximately 5,200 lbs, a payload of 2,500 lbs. The current comparable model, the M1097A2 weighs only 700 lbs more but can carry almost twice the payload or 4,400 lbs. The current production EV model M1113 has a payload of 5,100 lbs. Humvees are air transportable and drop-pable, and can be sling-loaded by helicopters.

Three Humvees can be carried in a C-110 Hercules transport aircraft and 15 in a C-5A Galaxy. In combat conditions, the vehicle can be delivered by the low altitude parachute extraction system without the aircraft having to land.

Due in part to the Hummer success in Desert Storm, AM General introduced a civilian version of the vehicle called the Hummer in 1992. The Hummer brand was later acquired by General Motors.

SP’s: What is Oshkosh Defense’s role in the Indian market?

Martin: We are interested in the Indian market. We are looking at opportunities in India. Oshkosh is definitely interested in the Indian market. We are looking for partners in India too.

SP’s: How are your vehicles different and better compared to others?

Martin: There are many companies which build vehicles, but there are only a few who built vehicles specifically for the military. Oshkosh Defense has not built any commercial vehicle. All our vehicles are built for purely military applications. We promise the end user that it will have a usable life span of at least 20 years. Our vehicles are used all over the world and so we have the capability to survive and thrive in those environments. In India, there are requirements for light armoured vehicles. There is also a wide spectrum of requirements in logistics. The vehicles are designed for varied temperature and terrain.

The fuel-efficient ground vehicle demonstrator, dubbed “FeD Alpha”, is on display this week in the Pentagon courtyard for an energy & Sustainability technology Fair. Last week it was on the exhibit floor at the 2011 Association of the US Army Annual meeting and Exposition in Warren, Michigan.

Since July, the FeD Alpha has been undergoing testing at Aberdeen Proving Ground. The low-rolling-tires alone provide an estimated 7 per cent fuel reduction. While officials said that percentage may not sound like much, if applied to the Army’s entire tactical vehicle fleet, it would add up to about $45 million in fuel savings annually.

The FeD Alpha also has: A high-efficiency 28-volt integrated starter-generator that enables electric accessories and 20kW of unboard power for equipment; a lightweight aluminium structure, except for the armoured cab and underbody V-shaped blast shield and an improved driveline that uses a unique carrier and differential assembly, including non-gearing hubs and isotropic super-finished gears to reduce friction.

Since July, the FeD Alpha has been undergoing testing at Aberdeen Proving Ground. The Aberdeen Test Center Roadway Simulator is validating the fuel economy of the vehicle. ATC is the world’s largest automotive test simulator and is designed to perform vehicle dynamics, powertrain performance, shock and vibration testing in a laboratory environment. It enables the FeD Alpha to be tested in a controlled environment so small changes in fuel economy can be verified.

‘We are actively investigating opportunities in India’
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ReconRobots wins orders for 315 Recon Scout XT robots

ReconRobots has been awarded a $4.8 million contract from the US Army Rapid Equipping Force for 315 Recon Scout XT micro-robot kits and an equal number of SearchStick devices. The SearchStick enables warfighters to covertly deploy and recover Recon Scout Throboots into a pole camera, which can view and use to see over compound walls, onto rooftops and into culverts. ReconRobots plans to complete deliveries of these micro-robot systems by October 2011.

"The era of the personal robot has arrived for US troops and, like the balistic vest and night vision goggles, our Recon Scout XTs will save many lives," said Ernest Langdon, Director of Military Systems for ReconRobots. "We are extremely proud that the US military has chosen ReconRobots to help protect our warfighters as they conduct dismounted operations in theatre."

Recon Scout XT micro-robots are deployed at the fire-team level – i.e., one robot for each four- to six-man fire team – to maximise situational awareness and standoff distance during route- and compound-clearing operations. More than 2,000 of the company's Recon Scout systems have been deployed by the US military and international friendly forces, and by hundreds of law enforcement agencies worldwide. Warfighters use the Recon Scout system to determine the layout of the enclosed spaces, identify potential IOs and to fix the location of friendly, indigenous or enemy personnel. Recon Scout XT weighs just 1.2 lbs ($40 gram), and yet it can be deployed in five seconds and thrown up to 120 feet (36 metres). Known for its simplicity and durability, the XT can be controlled with a single button and can be recharged in the field using standard 5500 or 25900 batteries.

HONEYWELL SPECTRA BALLISTIC MATERIALS TO PROTECT SOLDIERS IN ASIA

Honeywell has announced that its Spectra Shield ballistic materials will be used in combat helmets to protect soldiers in Asia. Dae-Sung Tech Corporation Ltd, a Korean body armor manufacturer, will use Spectra Shield II materials in helmets designed to protect soldiers against a variety of threats, including high-velocity projectiles, explosive devices and small-calibre rounds. The material's lightweight strength enables the helmet to provide optimal ballistic protection at a lower weight, which helps soldiers move more easily and comfortably.

"Spectra Shield II materials help the helmet achieve a 20 per cent weight reduction when compared with Dae-Sung's previous helmets." The company will produce the helmets with the material under a three-year contract with Honeywell. "Spectra Shield II ballistic material provides the right combination of light weight and ballistic performance that can help improve the protection, mobility and comfort of soldiers in the field," said James Thagard, global marketing manager for Honeywell's Advanced Fibers and Composites business. "We are pleased that Honeywell's lightweight Spectra Shield II materials will help protect military men and women in Asia." The contract represents the latest application of Spectra materials in combat helmets.

IRAQ ARMY RECEIVES M1A1 ABRAMS TANKS

The Iraqi Army has received its final batch of M1A1 Abrams tanks, which were ordered by the Iraqi Government through a foreign military sales (FMS) agreement with the US. The shipment included the last five of the 140 tanks that were stationed at Besmaya Combat Training Centre, which are part of the Iraqi Army's tank capability. US forces Iraqi Army modernisation programme desk officer John Hutches said, "The tanks are the latest digital tanks coming out of the US. They are the most modern M1A1s in the Middle East." The tanks will be tested for quality assurance before being delivered. After the delivery of the Iraqi Army tank regiments, with each regiment receiving 35 M1A1s and two M-88A2 M1A1 (M1A1 Paladin) long-barrelled recovery vehicles, the US Army will use the M1A1 tanks to defend its borders and to protect the sovereignty of the country. Currently, 85 tanks have been fielded to the army while more than 40 tanks are ready for deployment.

SRI LANKAN ARMY INTRODUCES VOICE/DATA NETWORK

The Sri Lankan Army has introduced its new voice/data communication network to improve its speed of information sharing, situational updates and exchange of information. The new communication network covers more than 50 Directorates and branches at the Army Headquarters, six security forces headquarters, 14 divisions, task forces and 22 regimental headquarters. The voice and video feeds will provide commanders with reliable data for accurate assessments and formalities, as well as strategic inputs and security requirements. The network also enables live meetings, audio and video conferencing, online file transfer, online file sharing, intranet e-mailing and the Internet. The network will also cover inland and island army formations within a few weeks.

RUSSIAN ARMY TO RECEIVE NEW MBTS

The Russian Army will receive new-generation main battle tanks (MBT) in 2014-20 as part of a large-scale rearmament of its military armoured units. Defence Minister spokesman Lt Colonel Sergiy Vlasov has said: "At present, Russian scientists are developing a new-generation unit, and in 2014-20 we are planning to replace the current fleet with new tanks on a large scale, so that the new models will constitute 70 per cent of the total," he added. The new MBT will feature enhanced firepower, manoeuvrability, electronics and armour protection capabilities over the T-90MBT. The Defence Ministry has not disclosed the type of the MBT for the replacement of the current fleet. However, Russian military experts believe that either the T-95 or the T-99 MBT will be selected for this purpose.

"The manufacturers involved demonstrated the effectiveness of their solutions. These solutions were assessed by the DGA, while also enabling the troops to discover their opportunities in the field and compare them to current systems," he added. A consortium including Cassidian, MBDA, Nexter Systems, Novadem, ICA and Aeroshile with co-prime contractors, Sagem and Thales took part in the Phoenix II demonstration trials. The Phoenix I battlefield trials were conducted for the French Army in 2007 and 2008.

BAE TO DELIVER LIGHT ARMOURED VEHICLES TO US ARMY

BAE Systems has awarded the US Army tAcom has awarded a contract to BAE Systems to produce and deliver nine second-generation international light armoured vehicles (ILAV) to the US Army tAcom has awarded a contract to BAE Systems to produce and deliver nine second-generation international light armoured vehicles (ILAV).

The US Army tAcom has awarded a contract to BAE Systems to produce and deliver nine second-generation international light armoured vehicles (ILAV) to the US Army.
enhanced the SAF’s capabilities and reduced the reliance on manpower. “The successful induction of the HMARS reflects well on the ability of SAF to respond decisively to new challenges and changing circumstances in the operational environment,” he added. HMARS has been designed to launch the entire multiple-launch rocket systems (MLRS) family of munitions, providing the troops with precision firepower, enhanced mobility and advanced networking capabilities. The rocket system carries a single pod of six guided MLRS M11 unitary rockets, which are 2.27m surface-to-surface mortars and smaller global positioning systems-aided weapons.

AUSTRALIA APPROVES NEW ARMY TRAINING VEHICLES

The Australian Government has approved the acquisition of more than 950 M11 four-wheeled military vehicles, and trailers and associated equipment, which will be used for training purposes by the Australian Defence Force (ADF). The combined first and second pass approval is for the acquisition of light and lightweight tactical training vehicles under Land 121 phase 5A. The acquisition includes 950 new ‘L-Wagon’ four-wheel-drive vehicles from Mercedes-Benz, along with 200 modules and 830 trailers. The modules will be manufactured and integrated onto the vehicles by GH Varley; while the trailers will be provided by Haulmark Trailers. The Land 121 Phase 5A project aims to provide a fleet of tactical vehicles and an enhanced training capability to the Australian Army to prepare for operations in armoured vehicles.

GD AWARDED US ARMY COMMAND HARDWARE SYSTEMS-2 CONTRACT

General Dynamics (GD) has won a $3.7 billion fixed-fee, plus-performance fee, level-of-effort, indefinite-delivery contract to provide computer hardware and software to the US Defense Department. The five-year contract, which will be awarded in four task orders on a best-value basis, will increase GD’s current computer hardware and software contract with the Defense Department to a potential $5 billion, ten-year COTS-1 effort that was awarded to GD C4 Systems in 2003. According to a GD spokesman Rob Doolittle, the new contract will enable procurement of commercial off-the-shelf computer hardware and software that includes computers, radio equipment and other communication equipment and assets at competitive prices. Work on the contract will be carried out at Massachusetts and is anticipated to be completed by August 26, 2016. The US Army Communications-Electronics Command will be the contracting activity.

ADDITIONAL ROBOTS FOR US ARMY

In a spirit of cooperation and understanding, India and Russia held their annual meeting to review the defence ties in Moscow on October 4, 2011, and expressed ‘readiness to take all necessary measures to further expand the cooperation on a mutually beneficial basis.’ In a protocol signed after the eleventh meeting of the India-Russia Inter-governmental Artillery co-chaired by the Defence Minister A.K. Antony and his Russian counterpart A.E. Serdyukov, both countries have agreed to work together on a broad range of initiatives, which will be aligned with their national interest. Both countries have agreed to coordinate their efforts to amongst other things, enhance strategic and operational cooperation, and to explore opportunities for joint production or co-development of equipment and cutting-edge defence technologies, modernisation of military equipment and joint manufacturing of military systems.

INDIAN ARMY TO DEPLOY ARMED HELICOPTERS

The Indian Army will induct the first attack version of the indigenously developed attack light helicopter (ALH) Rudra into the army aviation corps this year, defence officials have said. Rudra is a ‘heavily loaded’ variant of the ALH Dhruv helicopter and is armed with an array of guns, rocket pods, and air-to-air and anti-tank guided missiles. The weapon system is expected to enhance the army’s aerial fire power capabilities and is part of its modernisation and capability development efforts.

APPOINTMENTS

Lt General J.P. Nehra has taken over as the Adjutant General of the Indian Army. He succeeds Lt General M. Sattarbhwal. Lt General Narendra Singh has taken over as the new Deputy Chief of Army Staff (Planning & Systems). He succeeds Lt General J.P. Singh.
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