



Fortuitously the Tenth Anniversary of the magazine coincided with the Seminar

Seminar Report Intelligence Surveillance Reconnaissance

► Defstrat Team

The conduct of military operations since time immemorial has been contingent on ISR. There would be no gain saying that ISR is old as the history of warfare. Only the means and devices have continually changed. From the spies with sly looks, in the olden days, to satellites orbiting the earth, to manned aircraft and to unmanned aircraft; we have indeed travelled a long distance. ISR has always been and will remain an important facet, impacting decision making by commanders, like none other. It covers all three dimensions of space—the land, the sea and the air.

Recognising the import of the issue, Defstrat, in concert with CENJOWS, conducted a two-day seminar on the subject at the DRDO auditorium on 21 and 22 Mar 2017. We are proud to state that the function was graced by none other than the COAS himself besides many a luminary from the three services, the Industry and last but not the least from foreign defence forces, namely the US, the UK and Israel

Opening and Keynote Session

The Opening and Keynote Session was chaired by Lt Gen Vinod Bhatia, PVSM, AVSM, SM (Retd), Director CENJOWS. He had the following to say during the welcome address.

- The Indian Armed Forces are the most battle-hardened forces in the world.
- Operational preparedness and operational readiness are imperatives at each stage and ISR is the lynch pin as far as war fighting is concerned.

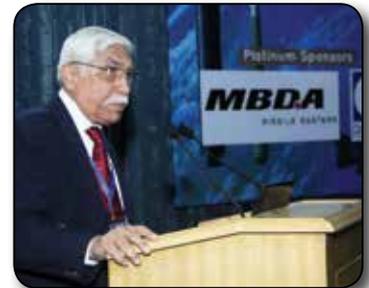
- Over the next two days we will discuss the ISR vision of the Indian Armed Forces, technical requirements, the availability thereof and integration of the assets of the three services.

A special address was given by General Bipin Rawat, UYSM, AVSM, YSM, SM, VSM, ADC, Chief of the Army Staff, he stated the following:

- Very happy to be present at this seminar and noticing that amidst us we have Academia, representatives of the Industry, the three services as also from the CAPE.
- Future battle field is complex; therefore, we need to integrate ISR with the command and control structure as well as we can.
- We must develop integrated systems based on our requirements as also basis the lessons learnt from past experiences.
- There are still some grey areas which need to be covered.



Gen Bipin Rawat
Chief of the Army Staff



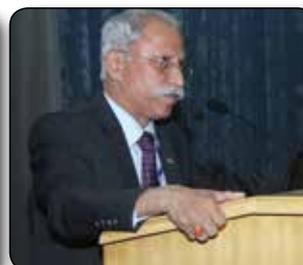
Lt Gen Vinod Bhatia (Retd)
Director CENJOWS



Lt Gen AB Shivane, DGMF



Mr M V Gowtama
CMD BEL



Lt Gen K T Parnaik (Retd)
Jt MD, Rolta India



Lt Gen Michel Petre (Retd) MBDA

- Future threats will vary from conventional to hybrid as also cyber. All systems must be interoperable and be of assistance in all kinds of operations.
- We can only exploit our C4ISR capability if it is duly linked with our weapon systems. To achieve this, we will need fully secure communications. The inaugural address on Power of Information and ISR in Indian Context was delivered by Lt Gen Subrata Saha, PVSM, UYSM, YSM, VSM**, DCOAS (P&S). He enunciated the following: -
- We must develop models which are innovative and exploit and harness all the capabilities available across our arms and services and build in analytics.
- We have ordered a study to take stock of the Army's ISR requirements and integrate them across the spectrum so that we can enhance our capabilities.
- There is much more to ISR than meets the eye- we need to link all possible dots viz cyber intelligence, financial intelligence and open source information including social media and harness them through available technologies.
- We must make solutions relevant to our scenarios and these solutions should be available to us 24/7, with specific reference to day to day operations in which we are involved.
- There is a need for synergy between the three services.
- The Army has made a massive outreach to the industry and the academia to include signing of a MoU with five IITs, the inputs from the academia have been of immense help.

Lt Gen AB Shivane, PVSM, AVSM, VSM, the DGMF delivered the Keynote address on Indian Army ISR Perspective and Challenges

- We need to holistically address ISR needs and challenges.
- There have been tremendous technological advancements in the field over the years and ISR has indeed become a force multiplier.
- Key determinant of success in the future battlefield will be the aspect of info superiority-which will be the basis for taking decisions.
- However, we must have the ability to handle the information overload and clutter; evolving means that help us function on a need to share basis.
- ISR will help in decision dominance and rapidity of action.
- We must choose pragmatic solutions and gradually shift from platform centric to network centric systems, which are well integrated, within the three services. Communication networks will be the heart of ISR and must work seamlessly.

Mr MV Gowtama, CMD BEL spoke on Exploring Indigenous Solutions for Comprehensive ISR Support to Indian Armed Forces and said that defence preparedness is measured on ISR Capabilities and such capabilities are important both for conventional and asymmetric ops. He stressed upon the need for robust communications.

Lt Gen KT Parnaik (Retd), Jt MD, ROLTA touched upon the role of India Private Sector in Support of ISR. He stated that the industry is seized of service requirements. DPP2016 motivates Make in India and we must aim to digitally integrate all three services.

SESSION 2: ISR in The Indian Context: Technologies and Integration

The session was chaired by Lt Gen JP Singh, PVSM, AVSM (Retd), Sr Advisor DRDO, former DCOAS (P&S) who in his opening remarks brought out that tasks for the armed forces and the CAPF are continually becoming more and more complex. We must switch from a platform centric to a network centric approach. The info grid at various levels must work in synergy and cooperation. This would greatly enhance our engagement capability. During the session, there were talks given as under: -

- Delivering Enhanced ISR Capability and Capacity to Meet the challenges of Network Capability Warfare-Lt Gen Rajeev Sabharwal, Commandant MCTE.
- US Army's Modernization in Support of an Enhanced Intelligence Enterprise- Maj Gen Charles A Flynn, Deputy Commanding General, USARPAC
- New ISR Technologies and Networked Firing in the Tactical Battlefield-Lt Gen Michel Petre (Retd), MBDA
- A Systems Integrator's Perspective on Persistent Surveillance in Land Operations"-Andrew Pryor, Rockwell Collins
- Integration of Technologies (Sensors, Platforms and Communications) to present real time picture

Commodore Jagdish Anand (R), Sr Advisor Saab

Salient aspects that were put forth are as under: -

- C4I2SR is the new acronym-the second 'I' meaning interoperability



Lt Gen Subrata Saha, then DCOAS (P&S)





Lt Col Geraint Evans, UK Army



Wg Cdr Rahul Tyagi



Mr Eric Wasson, Lockheed Martin

- Networks are presently loosely coupled-we need to interlink all platforms.
- We must have a data base for the data being churned out by the sensors for the shooters to use
- Information should be synced in time and out of sync in space i.e. it should be accessible anywhere.
- We must have processes in place and impart the requisite skills to persons involved.
- At the Tac level, we must look for both manned and unmanned teaming and organise fusion cells.
- There are new technologies available to enable networked firing in the tactical battlefield.
- The Gripen Aircraft has a multitude of situational awareness aids.

SESSION 3: Operational Data Architecture for C4ISR Systems

The session was chaired by Lt Gen Rajeev Sabharwal, Commandant MCTE. He stated that we need appropriate architecture as per need and must adopt best practices. The entities that we deploy, need to be made smart i.e. they must be capable of giving and receiving information. Talks as under were given during the session.

- Integration of ISR Assets with the Intelligence Analyst for Rapid Response Targeting-Mr Eric Wasson, Lockheed Martin
- Land Environment ISR- Enabling Challenges and Concepts- Lt Col Geraint Evans, SO1, ISR, UK Army
- Leveraging Satellite, Sensor and Commercial Imagery for Enhanced ISR Capability - Wg Cdr Rahul Tyagi

Key issues that came up were: -

- There is of the shelf software available for analytics.
- The overall system must audit all information and should provide reach, range and assurance.
- Biggest challenge is the humongous amount of data that is available along with the huge No of networked devices-this will also impact privacy issues.
- OSINT and commercial intelligence are not one and the same thing.
- Small satellites, which are not cost prohibitive are available for meeting C4 needs.

- There is a need for integration of ISR assets with intelligence analysts for Rapid Response Targeting.

Session 4: GIS and Smart Technologies in aid of ISR network

The session was chaired by Lt Gen VG Khandare, AVSM, SM, DGDIA, who stated that there were constraints in incorporating GIS therefore we must look at incorporating smart technologies and have Data Fusion to be able to disseminate information in real time. Other speakers at the session were: -

- Enhancing ISR Capabilities to obtain Real Time information in a Networked Battlefield, Digital Army Projects and Lessons Learnt - Lt Col Guy Tzaidi, DAP, Israel Army
- Next Gen ISR Technologies for Enhanced Operational Efficiency - Ashwani Mehra, Associate Director, ROLTA India
- Integrated Security for Coastal and Island Territories and Amphibious Ops -Cmde Dalbir S Gujral, PDNSO (Indian Navy)
- Integrated Border Management Solutions:- Mr. R Muralidharan, CTO, TATA Power SED

Key issues that came up during the session were: -

- The Israeli Defence Forces launched the Digital Army Programme in 2004 with a view to Digitize the army, under one full operational concept to significantly upgrade the ground forces war fighting capabilities.
- The programme developed in a graduated manner and the second phase known as DAP 2017 has now commenced. It will be an improvement wherein each commander will get information specific to him.
- Challenges in ISR are that there are multiple agencies.
- International Fusion Centres have opened in Singapore to monitor the South China Sea.
- The Border Management System being developed by TATA SED is no different from ISR.

Session 5: ISR Strategy for the Indian Army

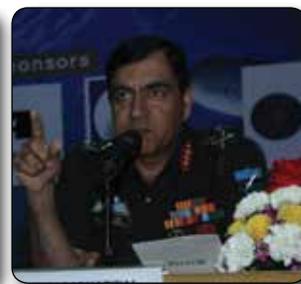
This was an interactive panel discussion on the subject: Status Check on Technologies, Requirements and the Way Forward for Laying down a Framework for ISR in the Indian Context



Ashwani Mehra, ROLTA India



R Muralidharan, Tata Power SED



Lt Gen R Sabharawal, Comdt MCTE

Chair: Lt Gen PS Mehta, AVSM, VSM, DCIDS (DOT), HQ IDS-stated that the Israeli model is very pragmatic and need based, something we could emulate.

Panelists:

- MG Charles A Flynn, USARPAC
- Lt Col Guy Tzaidi, Israeli Army and Lt Col Geraint Evans, UK Army
- Brig Yash Mor, DDG, DGMF, Indian Army
- Mr. Rahul Chaudhry, CEO, TATA Power SED
- Andrew Pryor, Rockwell Collins

It was discussed that, it is technology which enables people and not the other way around, therefore people must be skilled. The aim of the study that the Indian Army is doing is to optimise the resources that we have as the Indian Army has its own set of unique sets of challenges due to varying border conditions. We need to ensure security of GIS and due training of personnel. The industry desired that there should be no barriers to policy.

Key Takeaways

Leadership. ISR will always remain an integral part of the Command and Control structure. Commanders are the ultimate consumers of intelligence. Therefore, leaders must be intimately involved and drive the intelligence collection, integration and analysis process at every stage.

Doctrine. The Indian Armed Forces must have a comprehensive doctrine for ISR. The doctrine should identify requirements, look at the inadequacies, threats and capabilities to kill/degrade the same. The doctrine must cover all three services and concerned agencies. And once the doctrine is in place a Road Map must be drawn up, having removed all policy barriers. We could emulate the Israeli's to the extent required.

Next Step for Us. With advancements in technology there is an availability of a plethora of systems, it is therefore imperative that we examine the entire canvas holistically, imbibe the relevant technologies and create fully integrated and interoperable systems which would help us to achieve requisite battlefield transparency and provide due synergy between the three services and other relevant agencies. We must move away from a platform centric to a network centric approach. A prerequisite for an effective ISR system are secure

communication networks; the architecture for these must be developed with due thought to enable more users to join in when required.

Structure. We have two options for putting the C4I2SR structure in place at the services level, one option is to go in for a federated structure and one is a centralised option. It is felt that a federated structure would promote jointmanship, give better redundancy, have less info overload and help faster decision making. There would be certain prerequisites for such a structure; like standard protocols and common data formats etc.

Intelligence and Information Fusion. Products that combine multiple intelligence capabilities are better informed and more accurate. All-source intelligence should layer reporting from multiple intelligence disciplines and depict the results geospatially. Fusion is a top-down driven leadership function which enables speed and accuracy of decision by the Commander.

Skills and Organisation. It is imperative that personnel involved in ISR activities are duly organised and imparted the requisite skills to quickly analyse data. An example of such an organisation is the fusion cells established by the US Army. Of the shelf, analytic tools are available- we must make use of these. However, though the effort would be to reach the right deductions quickly, there is also a need to have oversight to ensure accuracy.

Data Centres. With the humongous data that would be available, there is a need to archive the same as also ensure that it is easily retrievable. Appropriate data centres would be required for the same. Information being provided should be synced in time and out of sync in space i.e. it should be accessible anywhere.

Shortcomings in Military Satellite Imagery. Due to high velocity of change in many locations on earth - a military commander's own satellite based resources, which are not in sufficient numbers, do not allow quick revisits. There are also constraints of lower accuracy and grosser spatial resolution. Commercial Imagery can fill the gaps, it also offers better electronics and data computation, processing and integration. [SA](#)