

Future Artillery India 2017



Lt Gen P Srivastava DG Artillery



Lt Gen PM Bali, DG PP

Opening and Keynote Session

Lt Gen Vinod Bhatia introduced the Keynote session and the seminar with his Welcome Address stating that CENJOWS and Defstrat have been providing a common platform to service professionals, academicians and the industry to achieve congruent views on various subjects of defence interest. He said that though the artillery has a very important role to play, slow progress has been made in its modernisation with the 410 Bofors guns being the last major procurement (this was three decades ago). He also stated that India has the expertise and we can achieve great success, if we put our heads together as is evident from the 'Dhanush'.

Lt Gen PM Bali, VSM, DG PP delivered the opening address and stated therein that artillery is a major component of war and the role of the arm has changed from only providing fire power to that of shaping the battlefield and that the devastating effect of its fire power has increased over the years as was very apparent during the Kargil War. The future battle field will be much deeper, with that availability of real time information and hence the tasks of artillery will not be restricted to the contact battle only. In view of the rapid advances in technology we need to revisit our employment philosophy as also enhance the technical threshold of our soldiers.

The keynote address on the Strategy for Modernisation was delivered by Lt Gen P Srivastava, AVSM, VSM, DG Artillery. He started off by saying that the artillery needs to capture the nation's imagination. Revolution in artillery is a long term programme and essentially implies indigenisation. We are on the right path as far as modernisation is concerned and our requirement is that of a precision kill system that has a range of approximately 24 km and an accuracy of 2M. We also need to address the issue of technology enhancement in other systems like met equipment and weapon locating radars etc. We are also inadequate in the availability of precision ammunition as of now, however, the issue is being given due attention.

Mr N K Sinha, Member OFB delivered a Special Address articulating OFB's vision. He stated that the seminar has done

▶ Defstrat Team

Centre for Joint Warfare Studies and South Asia Defence & Strategic Review organised a seminar on 'Future Artillery India' on 27 and 28 Apr 2017 at the DRDO Auditorium. The two-day seminar had some very engaging presentations and enriching discussions on the vastly important issue. The seminar was well attended by serving and retired officers from the services, DRDO, DPSUs, members of the industry and academia.

The value of such seminars is clearly underscored by the statement of one of the speakers, during the current seminar, that the idea of 'Dhanush' germinated during one such previous seminar, on artillery, conducted by South Asia Defence & Strategic Review. It is indeed a feather in our cap.



Mr NK Sinha, Member (WV&E), OFB



Mr Noel Eric, Nexter Munitions



Mr Saurabh Kumar, Member (A&E) OFB



We have had guided munitions such as Krasnopol in our inventory for a while but they have their drawbacks. These shortcomings have been greatly overcome by modern technology viz GPS and inertial guidance for projectiles.

Session 2: Developing Artillery Capability that can adapt to future conflicts to include terminal effect (Munitions)

Lt Gen JP Singh, PVSM, AVSM (Retd), Sr Advisor DRDO, former DCOAS (P&S) was in the chair and stated that artillery is a very potent instrument of war and that no war is going to be fought or won without understanding the employment and use of artillery. The subjects covered during the session were:-

- Gun Technologies and Armaments developed by OFB: Mr Alok Prasad, DDG (W), OFB
- Advance Ammunitions from Nexter Munitions: Mr Noel Eric, International Sales Director, Nexter Munitions
- Honeywell for Artillery Systems: Mr Faizi Mohsini, Country Head, Defense & Space, Honeywell Aerospace – India
- Developing and Productionising Artillery Ammunition in India; the way ahead: Sh Sartaj Singh, Director Solar Systems
- ATAGS A Futuristic Howitzer Gun System: Col Amarjit Singh Jr, Bharat Forge-Elbit
- Ammunitions and the Way Ahead: Mr Saurabh Kumar, Member (A&E) OFB

yeoman service to the cause of defence modernisation by making various stake holders understand each other's requirements. Dhanush development over a short period of time is a fall out of the synergy thus created. The projected requirement of guns, upgrades and ammunition in the coming years is to the tune of 5 bn US dollars. OFB is gearing up to meet the requirements by improving infrastructure, to be able to match up with the industry both Indian and Global.

Another Special address was delivered by Lt Gen Arun Sahni, PVSM, AVSM, VSM (Retd), former GOC-in-C, SW Command on enhancing the Terminal Effect in Battle. He started off by saying that the congruence of technology and operational requirements warranted that effect at the terminal end be enhanced. Three major events viz the end of the Cold War, the 1990-91 Gulf War and the 9/11 attacks have impacted military thought. The first resulted in a slowdown in development of conventional weapons, the second depicted the importance of destruction, though, during its conduct, airpower came across as a higher priority than artillery. And the last brought out the criticality of precision to avoid collateral damage. Enhancing terminal effect coupled with precision is therefore an imperative.



Mr Faizi Mohsini, Honewell Aerospace-India



Mr Sartaj Singh, Director Solar Systems



Brig Samir Gupta, DDG 'A' Artillery Dte

The session gave an opportunity to the Industry to put forth their views as also highlight their achievements. Alok Prasad stated that it is better to build to design than to build to print (with TOT) as there would be issues related to maintenance in the latter case. Noel Eric spoke at length about precision artillery munitions including SPACIDO which is a trajectory correction system for artillery shells after firing. SPACIDO is independent of the GPS and is a completely standalone system that uses real shell velocities during the first minutes of flight. SPACIDO is compatible with all existing 155 mm and 105 mm artillery munition. He also spoke of BONUS, a top attack anti-tank 155mm artillery munition; its distinctive feature being unrivalled hit probability. Faizi Mohsini spoke of the TALIN an inertial navigation system. Honeywell is manufacturing the same in concert with TATA Power SED. Sartaj Singh brought out that Solar Systems which is presently involved in manufacture of industrial explosives is planning to diversify into defence explosives. Towards this end they have taken TOT from DRDO for Pinaka 1 and 2 munitions and that Defence R&D and Private Sector are fast closing in to fill the capacity gaps. Amarjit Singh stated that the ATAGS is hundred percent indigenous and a fitting example of synergy between the industry, OFB and DRDO. Saurabh Kumar said that there is increasing collaboration between the OFB and private industry as the industry is now



Col Amarjit Singh, Bharat Forge-Elbit



Mr Naresh Ummat, MD, Baracuda



Col Sunil Prem, CMD, Navyug Infosolutions

getting involved in making critical components of ammunition.

Session 3: Leveraging Modern Technologies to Enhance Artillery's Effectiveness

The session was chaired by Lt Gen Vinod Bhatia who said that an effective artillery would be a very important battle winning factor. The other speakers during the session were:-

- Brig Samir Gupta, DDG 'A' Artillery Dte

- ◆ Unmanned Aerial Vehicles; Necessity and Feasibility

- ◆ New tactical and strategic roles for unmanned aerial vehicles

- ◆ Overcoming the limitations of unmanned aerial vehicles

- Signature Management in Artillery Systems: Mr Naresh Ummat, MD, Baracuda

- Robotics and their contribution to Modern Warfare: Col Sunil Prem, CMD, Navyug Infosolution
- New Generation Technologies for Artillery: Mr R Muralidharan, CTO, TATA Power SED
- Integrated Artillery in Digital Battlespace: Mr Viney Katyal, GM (MILCOM), BEL

The salient points that were brought out by various speakers are given in the succeeding para.

Brig Samir Gupta said that technology has enabled a high degree of transparency in the battlefield and UAVs play a critical role in this aspect. He dwelt at length about the capabilities that are desired and exist in this domain. Naresh Ummat said that signature management is critical in view of enhanced battlefield transparency. He also stated that there exists a capability of making the equipment as close to the environment as possible and said that India was the only country that was using jute nets for camouflage. Though synthetic nets are costly the cost factor is largely offset by the fact that they have a life span of ten years. Robotics is in a nascent stage in the armed forces said Col Sunil Prem but has great potential for use by the artillery. R Muralidharan stated that TATA Power SED is looking at new generation technologies with focus on safety and creating

trusted platforms. There is a shift towards all electric drives. The ATAGS has all electric drives save the recoil system and the suspension. The ultimate endeavor is to provide systems which are smart, simple and soldier friendly. Viney Katyal of BEL brought out that artillery was the most futuristic arm insofar as digitization is concerned and that it was being done at three levels.

Session 4: Future role of Field Artillery

This was a panel discussion on 'Examining Future Role of Field Artillery' to include the following aspects: -

- Type of Targets to be Engaged; Ammunition and Weapon Systems to neutralise them
- C4ISR and Digitisation, Current status and future options
- Indigenisation of Artillery Weapons and Munitions

The session was chaired by Lt Gen Arun Sahni. The discussants in the panel were Maj Gen Sanjay Sharma, GOC 42 Arty Div, Mr R Muralidharan, CTO, TATA Power SED, and Col Ajay Singh, Defence Analyst.

The discussion generated a lot of interest and participation by the audience was enthusiastic. What emerged was that the capacity and lethality of artillery has changed immensely making it extremely potent. Concentration of fire can now be done much better and seamlessly because of digitisation. Enhanced ranges due to technology enhancement and availability of RPVs for observation warrant that we relook at the type of support that is provided to formations. ISR will play a fundamental and important role in the artillery battle, hence it needs to be given proper emphasis. Conventional firing, with dumb ammunition, will continue to form a part of our operational strategy. Economic constraints will necessitate that the bulk of our inventory is made up of dumb ammunition with gradually increasing percentages of smart ammunitions.

Insofar as indigenisation is concerned, it was felt that the cycle time to develop systems is rather long. We need to manufacture systems in a time frame that the equipment is current at the time of induction. Systems must be flexible(open/modular) so that upgrades are facilitated. All equipment needs to have the necessary safety aspects, including cyber security incorporated. Reliability of the systems must be enhanced by including built in test equipment.

Takeaways.

Some of the major takeaways from the two-day symposium are given below.

Modernisation. We are on the right path insofar as modernization is concerned. We must continually move towards self-reliance with the involvement of all stake holders. However, it is important that budgetary constraints are kept in mind while working out our modernization plans. The spectrum of artillery is huge, extending from the target end to the firing platform and what lies in between. Add to that, ammunition, navigation

and digitization etc and the list gets longer. A truly modernized force, thus, would imply holistic growth of all segments from acquisition of targets to their neutralization.

Equipping Policy/Profile. Whilst working out our equipping policy we need to look at the complete spectrum of war ranging from the conventional to the asymmetric. A special consideration in this regard must be the type of equipment that we require for our northern borders. Our future profile will be based on the 155-mm caliber, with five distinct types of gun systems being introduced in the next 4 to 5 years. These are the ATAGS, Dhanush, a mounted system, a tracked system and the ULH. The guns will of course be supplemented by missiles and rockets. Due attention will also be paid to other systems such as weapon locating and surveillance radars and UAVs. Common gun towers are going to be inducted to replace the ageing KRAZ vehicles

Precision Munitions. We would need a healthy mix of dumb and smart ammunitions. The percentage of precision ammunition will be dictated by operational requirements as well as cost considerations. Scaling of the two types of ammunition will have to be need/sector based. DRDO has the relevant software for this and it must be made use of. As per present understanding, it will take anything from eight to ten years for smart ammunitions to be inducted.

Application of Fire. Artillery must be used to shape the battlefield. We need to revisit the aspect of application of fire, the traditional concepts of in direct support may have to be changed due to the ability to engage at longer ranges. Application of fire must be innovative and we need to be clear as to the employment of rockets and missiles, the role of the same will undergo a change in the next 4 to 5 years once the availability thereof increases.

Collaborative Approach. It is imperative to develop a collaborative approach and relationship amongst all the stakeholders including industry in order to develop lasting and cost effective solutions. DRDO, DPSUs and the Industry are all showing great interest and this enthusiasm certainly bodes well for the Make in India initiative.

UAVs. The Indian Army is looking at MALE (Medium Altitude Long Endurance) UAVs which can provide real time inputs both by day and night and conduct scans of large areas and convey the same to data analysis centres located on the ground. The UAVs need to have a high degree of mission reliability. The use of UAVs is limited only by imagination and somehow, we have not fully exploited their potential fully till date. Due to the numbers that are likely to be available we need to prioritise task

allotment. UAVs must also be used for data mapping.

Indigenous Capability Development. There was unanimous approval of Indian programmes like the Dhanush and ATAGS. Indian defence industry majors like BEL, Bharat Forge and TATA Power SED received special appreciation.

Training. Use of simulation in training OPs and rehearsing engagement drills will result in considerable cost cutting during training. It emerged that all future equipment will be coupled with procurement of simulators. The induction of simulators will succeed the induction of equipment and will not take place prior to the arrival of the equipment.

Cyber Security. We need to look at cyber security aspects at the stage of manufacture itself, this is imperative in view of the extensive digitization and networked systems that would operate in the future battlefield. In the absence of cyber security, the systems can be hacked into and immense damage and interference



caused. It could be by way of corruption of instructions to the BC/OP Parties, introduction of malware and in many other ways.

Signature Management. In view of the enhanced transparency, due to the availability of a multitude of varied types of sensors, signature management assumes critical importance. This is one area that must be taken a serious note of.

Robotics. This can play a vital role in reducing the logistic load by performing roles like ammunition storage and replenishment. Robotics can also be made use of for disposal of blinds and misfires at the ranges thus enhancing safety and for recce, observation and fire control. [SA](#)



Mr R Muralidharan, TATA Power SED



Mr Viney Katyal, GM (MILCOM) BEL



Maj Gen Sanjay Sharma, GOC 42 Arty Div