



Future Armoured Vehicles India 2017

▶ Defstrat Team



The Army Chief giving his views



Lt Gen Shivane, DGMF, addressing the audience



Lt Gen Bhatia, Director CENJOWS at the dais



Lt Gen MJS Kablon, DGPP



MK Singh, BEL



South Asia Defence and Strategic Review has been conducting an annual symposium on Future Armoured Vehicles. The eighth edition thereof was conducted in league with the 'Centre for Joint Warfare Studies' on 15 and 16 Nov 2017 at the DRDO Auditorium New Delhi.

The symposium provides a platform to bring together all concerned stake holders viz the user, DRDO, the industry, both indigenous and foreign and the PSUs and in consequence shapes participative discourse about future armoured vehicles. This year's symposium could not have been timed better because an exciting phase in India's quest for a 'Future Ready Armoured Vehicles' (FRCV) has started; the requisite momentum being imparted for the same with the issue of the RFI on 08 Nov 2017. The Strategic Partnership route will be followed in this instance.

Besides participation by various stake holders the discussions were greatly enriched by the participation of veterans, who brought to bear their vast experience on the deliberations.

We were also fortunate to have with us the COAS Gen Bipin Rawat, UYSM, AVSM, YSM, SM, VSM.

Opening and Keynote Session

Chairman's Address. This was delivered by Lt Gen Vinod Bhatia, PVSM, AVSM (Retd), Director CENJOWS. He stated that the tank as a weapon system is integral to both war prevention and war fighting and is also a veritable game changer. We have issued a RFI for 1771 FRCVs and are looking at a time frame of 2025-27 for the same to be ready for induction. The said platform will have to serve us through the next generation till the end of the century. We need to look at a lighter vehicle with potent ammunition and enabling systems to achieve SSKP. The aspect of affordability and availability in the right time frame are also key factors which need to be borne in mind. We need to synergise our capabilities to achieve the desired goal and that we do have the wherewithal for the same.

Opening Address Gen Bipin Rawat, UYSM, AVSM, YSM, SM, VSM, the COAS delivered the opening address. He brought out that the future battlefield is going to be complex and will encompass the conventional domain with concurrent threats manifesting in the sub conventional domain viz hybrid, space and cyber. We must therefore prepare accordingly and develop a full understanding of technology and weapon systems that will obtain therein. Our mechanised forces must be capable of operating both on the western and northern borders. Changes in terrain especially on the western borders, due to the now

abundant canal system have considerably reduced manoeuvre space, this will only add to the complexity in designing AFVs. Aspects like available bridge classifications and longer stand off distances will also greatly influence design. We must look at a lighter vehicle which provides adequate protection, day and night fighting capabilities and is adequately equipped for the cyber environment. We are looking at a time frame of 2025-2027 to develop our FRCV and modernise our mechanised forces; the FICV is already in the pipeline. The FRCV cannot be a tank alone -it must be a system of systems. Other support systems including logistic elements will also require synchronous capabilities. We cannot afford to make mistakes insofar as the design is concerned, therefore our engagements to evolve an appropriate design must be inclusive with all stake holders doing their bit. We look forward to full participation from the industry in this important endeavour.

Key Note Address. Lt Gen AB Shivane, PVSM, AVSM, VSM, ADC the DG Mech Forces stated that the tank is an integral component of both deterrence and war winning capability and the very nature of mechanised operations necessitates jointmanship. Capability building is like a marathon race and therefore we need to have a long term perspective (covering a period of 30 to 40 years) which should be periodically reviewed and changes made where required. The Mechanised Forces GSPS is an enabling document which spells out prioritised acquisitions and judicious scaling. The FRCV is being planned as a replacement for T 72 and is not meant to scuttle the upgrades in the pipeline or the Arjun Tank. We need to look at modular systems, which can be integrated with ease in the field army/corps Z.

Special Address. A special address was delivered by Lt Gen MJS Kahlon, the DGPP. He reiterated some of the points made by earlier speakers and added that we need to keep complementarity of systems in mind besides the important aspect of affordability. We must also guard against 'one size fit all' for tanks and ICVs and examine theatre/sector specific models to the extent feasible. He also spoke of the GOCO model - government owned commercially operated.

Industry Perspective. Was given out by Mr M K Singh from BEL; he dwelled on the symbiotic relationship that exists between the industry and the defence forces and assured that the industry will always be there to further the cause of the forces. With particular reference to BEL, he stated that BEL has been involved with a number of upgradation projects related to mechanised forces in the past and will continue to





be a major partner in all Make in India Projects in the years to come.

Session 2 : Equipping Mech Forces to Meet with Future Threats

Lt Gen Vinod Bhatia, Director CENJOWS, chaired the session. In the opening remarks he stated that operational preparedness is important for war prevention. It would be very difficult to predict future threats as they would be nonlinear and have varied manifestations. Issues brought out by other speakers are given in the subsequent paras

- Brig Vikrant Nayyar, Cdr SOTT, Armoured Corps Centre and School spoke on current and futuristic trends in AFVs. He stressed that the famous Iron Triangle (firepower, mobility and protection) which has been the basis of tank design for the past many decades is giving way to a new concept viz the Iron Pentagon to include lethality, agility, survivability, adaptability (a common chassis which lends itself to fitments as required to be able to operate in a multi terrain environment) and C4ISR. Besides there would be a need to incorporate augmented reality solutions in AFVs.
- Lt Gen Michele Petre of L&T MBDA Missile System gave a presentation a 5th Generation A Tk missile. The missile is based on a modular concept and has plug and play facilities. It is the only 5th generation missile in production in the world. MBDA is in a joint venture with L&T and will be able to make 2000 missiles in India.
- Mr Agnar Hannisdal, Director-Global Sales & Marketing, Nammo, spoke about next generation ammunition for the Indian Mechanised Forces. The Nammo Group is a world leader in the development and manufacture of shoulder-fired systems and high-performance ammunition products for various weapon platforms and are preparing for a JV in India as the Indian Armed Forces have increasing needs, which correspond well to Nammo's product portfolio.
- Mr K George of Honeywell India spoke about state of art technologies for upgrades and future platforms and stated that they have immense expertise in state of the art navigation systems.



Maj Gen Kulpreet Singh, ADGMT



Lt Gen Michele Petre, MBDA



Brig Amol Asthana, Zen Technologies

Session 3 : Optimising Training Methods to Enhance Combat Potential

It is not very often that symposiums focussing on technology discuss this very important aspect. However, as training is the lynch pin around which hinges the combat effectiveness of any force, a full session was devoted to training. The session was chaired by Maj Gen Kulpreet Singh, ADGMT 'B' and included a panel discussion. The points that emerged are given below.

Brig Amol Asthana of Zen Technologies Pvt Ltd stated that there are several challenges to combat training like availability of ranges/suitable training areas and restrictions on use of equipment and ammunition. Zen Technologies can provide training solutions that would greatly enhance combat potential. These solutions are in the shape of virtual training centres and simulators which can impart training and include force to force training in simulated live conditions.

The panel discussion was lively and various points were brought out, these are given below.

- The policy for mechanised units is to conduct field firing one year and manoeuvre training at the combat group level during the next year.
- A DGMF study has recommended establishment of a manoeuvre training centre at Babina. This will be a permanent establishment and have necessary equipment including simulators for participating units.
- MOTIS viz modernisation of training infrastructure in stations is underway. This would enable training by units without having to move long distances.
- Simulator Policy for the Indian Army and SDD has now been put under the PP Dte. It is intended to have 20% simulators in units by 2018 and 40% by 2020.
- To overcome various constraints due to various restrictions field firing should be a hybrid of training on simulators and actual firing.
- A major issue that comes up during training with foreign armies is the non-availability of interpreters. This issue needs to be addressed.
- The outsourcing of training, where feasible in terms of security aspects, needs to be examined holistically. The CAPF and the IAF are already following this model.

Session 4: Smart Survivability and Protection

The session was chaired by Brig Amit Loomba, DDG Eqpt, DGME. He started off by saying that there has been a

constant slug fest on between protection and newly developed ammunitions. However, with lethality increasing and threats manifesting in the entire 360-degree arc, there is a need to look at new ways of enhancing survivability as the weight of a tank cannot be increased beyond a point. We have therefore to look at layered multi spectrum survivability, which will encompass avoiding detection and avoiding being hit through protection systems. Other aspects that came forth during talks given by speakers are as under: -

- Mr Naresh Ummat, CMD, Barracuda spoke on smart survivability and said that it gives the first strike advantage by helping to avoid detection and identification. As the battlefield is now laden with sensors there is a need to defeat them. The MCS are platform specific mobile camouflage systems which provide 24-hour protection against signatures. Then there are soft armour protection systems which provide protection against armoured piercing ammunition and fragments and can withstand several strikes in the same area without any degradation of protection.
- Mr Rajesh Gupta, MKU, spoke on aspects pertaining to contemporary lightweight armouring solutions and composite materials which can help reduce weight by 30 to 35 %. The threats to vehicles both tracked and wheeled from IEDs and mines and the steps that can be taken to mitigate these threats were outlined. The aspect of clip on or add on armour which can be fitted on an as required

the equipment philosophy of the Indian Army wherein we are required to hold 30% state of the art equipment, 40% equipment having contemporary technology and 30% equipment which has obsolescent technology. He also gave out the OH and MR timelines.

- Col Vivek Uberoi of Alpha Design Technologies Limited brought about how they were involved in various projects with the army and stated that they were ready to upgrade TISAS to TIFCS; the DGMF requested them to submit a technology paper accordingly.
- Mr R C Sastry of BEL and Mr K Sudhakar of OFB gave their perspective on issues of 'Fleet Management' which impact them and how both the organisations have contributed to the endeavour of the Indian Army in general and the Mechanised Forces in particular to keep their equipment current and combat ready.

Session 6 : Future AFV Design Concepts

The session was chaired by Lt Gen J P Singh, PVSM, AVSM (Retd), former DCOAS and currently Senior Consultant DRDO. He stated that the issue of the RFI for the FRCV is a very important bench mark, insofar as the equipping of our mechanised forces is concerned and that we must now look at a tank that India needs for its future requirements. Thereafter, a panel discussion followed, and some very pertinent aspects came out. The panel included Brig Amit Loomba, Mr Rahul Chaudhary, CEO, Tata Power SED, and Mr Benjamin Lionel

It is imperative that Design, Development and Production agencies function together from the very beginning to ensure success of a complex project like the FICV/FRCV

basis was also discussed.

Session 5: Fleet Management

The session was chaired by Lt Gen N B Singh (Retd), former DGEME and included a panel discussion besides presentations. The Chairman said that the purpose of fleet management and upgrades is to effectively look after present assets to retain the combat edge. Fleet management needs to be looked at holistically right from preventive maintenance through overhauls and upgrades hence looking at the entire life cycle support. He also emphasised that upgrades must be need based. Aspects that were spoken about/discussed during the panel discussion are as under.

- Brig A Bhattacharya (Retd), former DDGMF gave out

DRDO, and Col SDS Hayer of Mahindra Defence Systems. The points which emerged are given below.

- Tank design is a bundle of contradictions with one parameter impacting the other; therefore, it is of the utmost essence that we are absolutely sure of what we want. We must, at the outset define what is required, basis our operational requirements and try to be terrain specific to the extent feasible.
- We also need to go in for technologies which are in consonance with existing infrastructure alternatively the identification of technologies to be incorporated and the requirement of infrastructure for the same (where it does not exist) should occur simultaneously.



K George, Honeywell



Brig Vikrant Nayyar, Cdr SOTT



Agnar Hannisdal, Nammo



- This is the age of digital manufacturing and therefore we need to look at system engineering and not system integration as was being done earlier.
- It is of the essence that all processes are put in place and all stakeholders sensitised about the same, so that there are no procedural delays.
- All stake holders must work in a spirit of cooperation so that the desired product is delivered in time.

Takeaways

- **Employment of Mechanised Forces.** Threats in the future will be varied and cover a wide canvas, ranging from the conventional to the asymmetric. We must be prepared to use our mechanised forces on our western and northern borders. Equipment design considerations must, therefore of necessity, take varied terrain types on the two borders and the spatial changes taking place along the western border and the impact thereof on operational requirements, into consideration.

we must be borne in mind is the gestation period and the fact that some of our current fleet will continue to be in service concurrently, warrants the need for standardisation. We must look at evolving and future technologies and a modular design which facilitates commonality of a platform for employment in different operational situations as also upgrades when required. We need to holistically consider issues such as weight, calibre of the main gun, type of protection system, ergonomics, a three or a four member crew and whether we need a wheeled or a tracked vehicle to meet our needs. However, the most important aspect is what is actually required by us to obviate the likely threats. We should not go in for any system just for the sake of it. Affordability and timely production must also figure as priority terms of reference.

- **Processes.** We must ensure that due processes are in place right from the very beginning. This will ensure that there are no glitches and consequential delays during the design, development and production stages.
- **Fleet Readiness.** Sustainment and upgradation of equipment is very important. We must look at smart and cost effective upgrades. It is therefore imperative that we go in only for what is required. The outsourcing model for sustainment of the fleet be considered as it is cost effective because logistics of creating facilities and training personnel is obviated.
- **Industry Perspective.** The industry is ever ready to assist

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- **Future Ready Combat Vehicle.** With the issue of the RFI for 1771 FRCVs on 08 Nov 2017, a much needed fillip has been given to Indian Army's quest for a FRCV. The project will take the route of a Strategic Partnership, which mandates that there would be relevant tie ups with foreign Original Equipment Manufacturers (OEM).
- **Design and Development.** The most important aspect of the FRCV project is going to be design and development. It is imperative that all agencies involved in the project work in synergy based on mutual trust and cooperation so that very realistic and synchronised goals are set and thereafter an earnest endeavour made to achieve the same. It would only be in the fitness of things that there is one nodal agency coordinating the entire project. The Army Design Bureau is best suited for this onerous task.
- **Technology.** Whether to go in for an evolutionary or a revolutionary design is a moot point. Whilst there are no clear-cut answers as far as this aspect is concerned, what

the forces in every which way that is possible. However, there are a few grey areas which need to be resolved. At times the requirement of the forces is not clearly spelt out. With DGMPF taking the initiative in inviting the industry to investigate equipment at ACC &S a very positive step has been taken. Another round of such activity is scheduled in the first week of Dec 2017. It would also greatly help the industry, if there is a single point of contact on the government side as at present they have to deal with several different agencies like DPSUs, DGQA etc.

- **Training.** A holistic approach needs to be taken to ensure that all training is meaningful and combat potential is continually enhanced. With advances in technology and availability of sophisticated training aids, it would be well worth the while to revisit our existing training models. We must also consider outsourcing certain aspects of training to the industry. There are several players in the market who possess the wherewithal to impart the requisite training. SA