

ARMoured VEHICLES INDIA 15-16 NOV 2017

1. The 'Centre for Joint Warfare Studies (CENJOWS)', in concert with South Asia Defence Strategic Review conducted the annual symposium on Armoured Vehicles India on 15 -16 Nov 2017 at DRDO, New Delhi. The symposium served as a platform to bring together the various stake holders viz users, industry, R&D, academia and the PSUs.

DAY-1 (15 NOV 2017)

OPENING AND KEYNOTE SESSION

2. **Chairman Address.** The Chairman Address was delivered by Lt Gen Vinod Bhatia, PVSM, AVSM, SM (Retd), Director CENJOWS. The Chairman lucidly highlighted the following facets pertaining to Mechanised warfare in general and the AFVs in specific:-

(a) The Tank has evolved since its inception in the World War 1 and will continue to remain pivotal in future conflicts.

(b) The Tank has to have capabilities to act both as a deterrent and an instrument for affecting decisive victory.

(c) The dynamic nature of warfare is ushering in new challenges and hence the AFVs also need to adapt to retain their cutting edge.

(d) As hybrid and 4G threats evolve and the conventional conflict scenario becomes more intense yet transparent, mechanized forces must modernize and adapt to the changing environment. Lethality, Survivability and Maneuverability acquire greater significance.

(e) Synergy of the Mechanised Forces with aerial platforms and force multipliers like UAVs and Attack Helicopters is an absolute must for operational success.

(f) Aforementioned there is an apparent need amongst the stake holders to synergise their capabilities for the future AFVs for the Mechanised Forces.

(g) It is a matter of debate whether the FACV should be revolutionary or an evolutionary in concept.

3. **Opening Address.** The COAS, Gen Bipin Rawat, AVSM, UYSM, YSM, SM, VSM delivered the opening address and highlighted the following issues pertinent to the Mechanised warfare:-

(a) The Mechanised Forces shall be required to operate in diverse terrain in the Indian Context. Thus the future AFVs should be capable of operating both along the Western & Northern borders.

(b) While the primacy of the Mechanised forces shall be along the Western borders however, the terrain along the Western borders is rapidly changing with greater urbanization & terrain hardening. This needs to be factored while evolving new doctrines.

(c) The AFVs shall continue to spearhead the Combined Arms Team both along the Western & Northern borders and thus it is imperative to have both Tracked & Wheeled platforms in the future.

(d) The Future AFV thus shall be a complex system of systems capable of operating in the full spectrum of future conflicts and needs to be equipped with the mature state of art cutting edge technologies.

(e) The COAS reiterated that since the RFI for FRCV has been uploaded the stake holders should converge to jointly evolve the SQRs duly factoring the threats and the capabilities mandated in the FRCV.

4. **Key Note Address.** The Key Note Address was delivered by Lt Gen AB Shivane, PVSM, AVSM, VSM, DG Mech Forces and the salient aspects of the same are enumerated under:-

(a) There is an imperative need for a holistic capability building of the Mechanised Forces duly considering the following facets:-

(i) Long Term Perspective

2. Future Threats

3. Budgetary allocations

(b) To facilitate the capability building of the Mechanised Forces there is a need for a balanced policy factoring the following attributes:-

1. Upgrades to the existing Fleet

2. Replacement of the obsolete equipment

3. Sustenance of the Fleet

4. Mitigation of equipment voids

100. With the increase in asymmetric warfare the requirement for armoured vehicles will increase in order to deal with multiple threats.

(i) In accordance with envisaged operational employment of the AFVs along both Western & Northern borders there is a need for a family of AFVs.

(ii) In conclusion the DG Mech Forces emphasized that the Way Forward for development of the FRCV should be based on a non segmented approach with equal ownership amongst the user, academia and the industry. He further qualified that the FRCV project should be time critical, cost sensitive following a progressive loop with a spiral approach.

5. **Special Address.** Lt Gen MJS Kahlon, delivered the Special Address and highlighted the following issues:-

(a) The FRCV & FICV should be viewed as National Projects due to the enormity of their size & scope. Impetus should be accordingly accorded by all stake holders to ensure timely fruition of both these projects.

(b) The budgetary challenges need to be duly dovetailed in the planning process to ensure pragmatism from the inception stages of these projects.

(c) Unlike the past wherein the available AFVs from the world market were imported by the Indian Army and then doctrines & tactics were evolved based on their capabilities, the FRCV & FICV project are providing opportunities to indigenously manufacture AFVs based on Indian concepts of war fighting and to optimally fulfill Indian Needs.

6. **Industry Perspective.** Mr MD Gowtama, Chairman and MD BEL gave a historical perspective and 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. He further stated that there was great room for cooperation and that BEL shall support the modernization endeavors of the Mechanised Forces.

SESSION - 2

EQUIPPING MECHANISED FORCES TO MEET

FUTURE THREATS AND LATEST TECH TRENDS.

7. The session was chaired Lt Gen Vinod Bhatia, PVSM, AVSM, SM (Retd), Director CENJOWS. The panel for the session comprised of the following:-

(a) Brig Vikrant Nayyar- Commander SOTT

(b) Lt Gen Michel Petre , MBDA

100. Agnar Hannisdal, NAMMO

(d) Mr Shunmugavel, Honeywell

8. **Chairman Address.** The Chairman highlighted the multifarious threats likely to be faced by the AFVs in the future conflicts. The AFVs of the future thus need to be equipped with means to survive & fight effectively in the complete spectrum of conflict. It is thus imperative that the future AFVs are

adaptive and equipped with the state of art cutting edge technologies to be able to effectively lead an all arms team.

9. Current and Futuristic Armoured Vehicle Trends with Special Emphasis on the Subcontinent:-

(a) **Threat Scenarios.** There is a need to factor in new threats and the likely operational scenarios whilst looking at futuristic AFV designs. Cutting edge & mature technologies need to duly coopted at the design board stage.

(b) **Wheeled versus tracked vehicles.** A pragmatic assessment of the wheeled v/s tracked vehicles should be undertaken duly considering the terrain and the operational requirements in the Indian subcontinent.

(c) **The Changing Triad.** There is a need to look beyond the conventional triad of fire power, mobility & protection to include aspects like communications, affordability, modularity et al.

10. **Fifth Generation Missile.** A presentation was given on 5th Generation ATGM, MMP, by MBDA, France, which is the next generation missile. The missile is based on a modular concept and has plug and play facilities offering the following features:-

1. Fire & forget
2. Lock on Before Launch & Lock on After Launch
3. Beyond the horizon reach

11. **Next Generation Ammunition.** An insight into the next generation ammunition was given by NAMMO. The salient aspects are as under:-

1. The depth of penetration for APFSDS ammunition are reaching beyond 800 mm RHA
2. The Muzzle Velocities of the APFSDS ammunition shall be beyond 2000 m/s
3. The L/D ratios of the projectile are reaching to the levels of beyond 30:1

SESSION-3

OPTIMISING TRAINING METHODS TO ENHANCE COMBAT POTENTIAL

12. **Fleet Management: Modernisation, Upgrades and Overhauls within a Budget Constrained Environment.** The session was chaired by Maj Gen Kulpreet Singh, ADG MT (B) and the panel for the session comprised of the following:-

- (a) Brig Vikrant Nayyar- Commander SOTT

(b) Brig Amul Asthana, Retd , MBDA

(c) Col I Collinson- Dir Trg

4. Mr Kishore Dutt, Zen Tech

5. Mr Shunmugavel, Honeywell

13. **Chairman Address.** The chairman underscored the importance of training towards ensuring success in war. He emphasized that technology has to be adequately leveraged towards ensuring effective mission oriented training. In addition modern means need to be utilised to objectively assess the training standards.

14. **Cost Effective Training** With the induction of the state of art equipment the cost of training has increased exponentially. Further due to the high cost of sustenance it would be incumbent upon the users to conserve the operational equipment to the extent possible. Thus it would be imperative to devise means for training while conserving the operational equipment.

15. **Automated Maneuver Ranges.** In order to imbibe realism in training for the full spectrum of conflict there is a imperative need of Maneuver Ranges. These ranges shall enable simulation of future battle field conditions and afford training opportunities to All arms Team while optimizing the available resources including equipment and training areas.

16. **Utilisation of Simulators for Training.** The simulators offer an effective alternative to training on the operational equipment without compromising the skills. The simulators can be programmed to simulate the various battle situations likely to emerge in combat, thus offering real time dynamism in training. These are also cost effective and hence need to be utilized pragmatically for training.

17. **Training Infrastructure.** The pressure on the real estate is there to stay and thus it is axiomatic that the traditional training areas would shrink. In order to enable training with equipment it would be essential to develop state of training hubs at identified locations. These hubs should cater to the training requirements of the Mechanised Forces as part of an all arms team in the diverse terrain obtaining in the Indian Context.

18. **Built, Operate & Maintain Training Facilities.** Suggestions were made by the Industry regarding the feasibility of outsourcing the development and maintenance of the training areas to the Industry as is prevalent in many NATO countries. Based on the user requirements the training facilities could be developed at the designated locations, which could then be utilized by the Indian Armed Forces without encumbrances of maintenance and the associated logistics.

DAY-2 (16 NOV 2017)

SESSION 4

SMART SURVIVABILITY & PROTECTION

18. **Smart Survivability and Protection.** The session was chaired by Brig Amit Loomba, DDG(AC)/DGMF and the panel for the session comprised of the following:-

1. Mr Naresh Ummat, Barracuda
2. Rakesh Sudan , SAAB
3. Mr Rajesh Gupta, MKU

19. **Chairman Address.** The Chairman highlighted the changing nature of warfare and the likely threats to the AFVs viz the top attack, shoulder fired, under belly et al apart from the conventional threats. Apropos, there is a greater requirement to provide adequate survivability to the AFVs. The passive protection measures alone would not suffice to provide adequate protection to the platform & the crew& hence the need for smart survivability solutions.

20. **Smart Survivability.** Smart Survivability gives the first strike advantage by helping to avoid detection and identification. As the battlefield is likely to be laden with sensors there is a need to defeat detection and the Mobile Camouflage Systems (MCS) provide this opportunity. The MCS are platform specific mobile camouflage systems which provide all around protection against various signatures. There are soft armour protection systems and provide protection against armored piercing ammunition and fragments and can withstand several strikes in the same area without any degradation of protection.

21. **Active Protection Systems(APS).** The APS offers the unique capability of detecting and destroying any incoming threat. The contemporary APS are modular, light weight and can be strapped on the AFVs w/o impacting the performance of the AFV. These provide equal protection in both azimuth & elevation.

22. **Contemporary Light Weight Armour.** Aspects pertaining to contemporary lightweight armouring solutions and composite materials were lucidly brought out. The threats to vehicles both tracked and wheeled from IEDs and mines and the steps that can be taken to mitigate these threats were highlighted. The aspect of clip on or add on armour which can be fitted on required basis was also discussed.

SESSION-5

FLEET MANAGEMENT

23. **Fleet Management.** The session was chaired by Lt Gen NB Singh (Retd) and the panel for the session comprised of the following:-

1. Brig Ashish Bhattacharya(Retd)
2. Mr Shaunmugam , OFB
3. Col V Uberoi (Retd), Alpha Design Technologies.

24. **Chairman Address.** The Chairman highlighted that the most important facet of fleet management is the serviceability of the fleet. He further exemplified that the potency of any fleet is directly proportional to the serviceability state of the fleet. Also the fleet serviceability is a correct indicator of the operational preparedness at all times for the various missions.

25. **Upgrades and Modernisation of the Mechanised Fleet.** During the life cycle of any equipment the cost of support is three times that of the initial acquisition. Since the gestation period of new equipment is 10-12 years, there is a need to plan for timely upgrades to retain it in the state of art category. This further compounds the cost of the weapon system. In addition the AFVs need to be put through the periodic interventions to maintain their optimal serviceability state. Apropos while the acquisition of the weapon system is the tipping point the acme lies in retaining its potency through its service life. There is thus a need to undertake periodic upgradation & plan for life time sustenance of the equipment. These aspects should ideally be dovetailed at the planning stage to avoid time & cost overruns.

26. **Outsourcing the Sustenance of AFVs.** The sustainment of the AFVs is a complex process which is both manpower and skill intensive. In addition it requires a massive logistics supply chain. There are countries which have outsourced the sustenance of their fleets. The British Army have outsourced these aspects and a representative deliverable given to the outsourcing agency is that X number of vehicles must be maintained at X standard at all the times. The outsourcing model is cost effective as the logistics of creating facilities and training personnel is obviated.

SESSION - 5

FUTURE AFV DESIGN CONCEPTS

27. **Future AFV Design Concepts.** The panel discussion was chaired by Lt Gen JP Singh, PVSM, AVSM (Retd) and the panel for the session comprised of the following:-

1. Mr Benjamin Lionel, Dir IRDE
2. Brig Amit Loomba, DDG(MF)/DGMF
3. Mr Rahul Choudhry, CEO TATA Power SED
4. Col Hayer(Retd), Mahindra Defence System.

28. **Chairman Address.** The Chairman appreciated the efforts of the service HQ in uploading a comprehensive RFI of the FRCV. He alluded that the RFI was the start point and there is an inescapable need for all stake holders to take ownership of the prestigious project to ensure timely fruition.

29. Salient aspects of the panel discussion are listed under:-

- (a) Although the FRCV shall be pursued under the Strategic Partnership clause of the DPP 2016 however, the project offers immense opportunities for the indigenous defence industrial base to grow.

2. The SQR for the FRCV should be jointly evolved in an iterative manner by identifying the mature niche technologies which could be co-opted in the FRCV.

(c) The capability of the Indian Defence Industry should not be underplayed and equal opportunities should be offered to the home grown industry.

(d) The indigenous expertise of designing and manufacture of the AFVs should be adequately leveraged.

30. **Conclusion.** Synergy based on mutual trust and cooperation must be created amongst stake holders and jointly evolve very realistic and synchronised goals and thereafter endeavour to achieve them in right earnest. MSMEs need to be encouraged to enable a robust defence eco system in the country aimed towards achieving self reliance in the defence sector. The FRCV must serve a larger purpose in building capacities and not remain limited to the development of the platform alone. This is imperative for the success of 'Make in India' initiative which aims at making the country self reliant in defence.