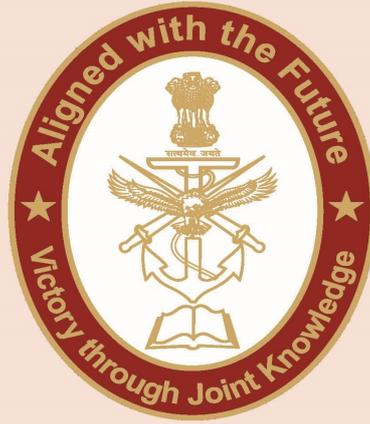


CENTRE FOR JOINT WARFARE STUDIES



CENJOWS

PROCEEDINGS OF CONFERENCE ON "SOLDIER MODERNISATION 2019"

ON 07 MAY 2019

BY

BRIG HS CHEEMA, SENIOR FELLOW, CENJOWS

Welcome Address - Lt Gen Vinod Bhatia, PVSM, AVSM, VSM, (Retd), Director CENJOWS.

1. Lt Gen Vinod Bhatia, PVSM, AVSM, VSM, (Retd), Director CENJOWS, welcomed all the participants in the conference on 'Soldier Modernisation'. He laid out the aim of the conference which was to give a common platform to all stakeholders in building Infantry soldiers' capability and make them battle worthy to fight future wars. Today, the buzzword is modernisation of Infantry Soldier for whom IA is looking for dream equipment. However, from his experience, he feels that there is no dream equipment but there is an optimal equipment which is optimal to suit the needs of an Infantry soldier. One must understand that it is the Infantry soldier that costs the minimum, yet delivers the maximum. The role of the infantry is not going to change. In fact, his role is going to be more challenging due to fast changing technology, high pace of war and more lethality. All-out effort has to be made to arm the soldier well, so that his aim can be achieved with minimum losses. An Infantry Battalion needs to be self-contained for seven days and is required to operate in hostile terrain under challenging operational conditions. In the end, a soldier who usually moves with a limited load of 20 to 25 Kg. So, we must meet this contradictory requirement.

2. Today IA need a soldier who has to be good in everything- intelligent, motivated, disciplined, committed, tactically good and that is what they are. So, when IA is looking at soldier modernization, they are looking at it from head to heel what all is required to be provided to him to make him more effective. As on today, due to various reasons even if IA army is able to provide 80% of arms and equipment of soldiers' liking then the aim would be achieved and IA would have done a good job. Till now, honestly IA hasn't done well to arm and equip the infantry men. IA is looking at hi-tech missiles and state

of the art technology for weapons, but if the infantryman isn't upto it, then IA hasn't done a great job. IA looks at equipment that can operate in all conditions from HAA to mean sea level that actually may not be possible. On top of it, 63% of arms and equipment is to be imported which is not only very expensive but procedures to acquire them are unwieldy and long. There is an urgent need to revamp the systems and also create inhouse capability to reduce the timeline and foreign support. The Director further expressed his hope that IA soon will be able to replace INSAS rifles as is being planned. Despite of all the delays and other hiccups, the Director is quite positive regarding the times changing for the good as he exhorted all stakeholders present for the conference to contribute and work towards giving the soldier what he deserves.

Opening Address: 'Capability Enhancement of a Combat Soldier in keeping with overall Modernization' Lt Gen Sanjay Verma, AVSM, VSM, DGWE**

3. DGWE stated that the Indian infantry soldier is a main player of IA in all types of operations. Hence, IA should not look at the infantry soldier in isolation but as a part of whole of an infantry battalion and an infantry brigade. IA needs to consider Inf soldier as a main platform which needs to be equipped with various hi-tech systems so he can meet various challenges of modern warfare and he can operate in every theatre. If Director, CENJOWS states that IA has not done proper justice in equipping Infantry Soldier then why is it so? Some of the reasons, as laid out by the General are:-

- (a) The technology in equipping an Infantry soldier is changing very fast; what is available today in three years' time it changes and something better is then available. Hence before a system is inducted it seems to be obsolete.
- (b) Infantry numbers is huge hence any addition of system costs huge amount.
- (c) Indian system to induct equipment for the soldier and to induct Tanks is same. Can such a system work efficiently?

4. For the infantry soldier modernization- IA has to look at procurement cycles of six month to a year. Once equipment or a system is procured, then it needs to be exploited for about five years and in the meantime, say after three years or so IA must look for the replacement as technology and operational conditions change rapidly. However, on ground things are not working in this manner and processing methods needs review. DGWE then gave example of UAV, "Can one type of UAV today fit requirement of all its users?" Similarly, take another example of body armour: Can it be same for operations in different terrain? Can clothing of a soldier be the same for operating under different operational theatres? DGWE is of the view that as an infantry soldier has to operate in different terrains in different command theatres, the requirement of equipment and system has to be different and the IA here needs to take a paradigm shift in terms of acquiring modernization. Procurement has to be theatre specific. Certain degree of such requirement is being met through Army Commanders Financial fund but this needs to be given more thought. Certain standardized requirements could be worked out by AHQ and MOD, but other requirements must be procured as per theatre requirement.

5. DGWE also suggested that while processing the cases of GSQR or procurement, it is necessary to keep some flexibility for procurement of the system so that it can at least be exploited in some areas. As after having gone through complete cycles of procurement, one may find that this may not be suitable for a particular area then, the complete proposal gets shelved which takes it back to the starting point without any

induction and also results in delayed equipment. DGWE summing up his address stated that in this conference he was looking for implementable, pragmatic and cost-effective way forward and the recommendations for equipping the Infantry soldier in a better way.

Keynote Address: 'Examining Multiple Threats and Equipping the Soldier for Future Wars' by Lt Gen SS Mishra, VSM DG Infantry.

6. DG Infantry complimented the organisers for choosing a very contemporary topic i.e. 'Examining Multiple Threats and Equipping the Soldier for Future Wars'. Since the canvas of this topic was vast, he chose to restrict it to Indian context. He further stated that his effort has been to move forward from where his predecessors have handed over to him. Howsoever sophisticated equipment might be and however well an army is equipped, it is ultimately the soldier who is most crucial and unless he reaches the objective- the victory can't be claimed. That is the significance a soldier has and IA needs to equip him well so that the soldier can reach the objective safely and achieve victory. Technology is changing fast and IA has to equip its Infantry soldiers accordingly. India has not invested in R&D hence to equip its soldiers one has to import it and it is cost prohibitive.

7. Indian threat perception is very complex in nature and is both conventional and sub conventional in nature. Hence, Infantry soldier's needs to be equipped to face both threats but the equipment cannot be compartmentalised i.e. Separate for conventional and separate for sub conventional. There has to be an overlap and commonality somewhere as such it will be difficult to afford. Being in constantly in combat for sub conventional one needs to equip to save casualties but prime concern will always be to prepare for conventional threats.

8. DG infantry speaking on specific issues on equipping Infantry soldiers covered five aspects i.e. Lethality, Mobility, Survivability, Situational awareness and some misc issues. As regards lethality IA has changed its philosophy from incapacitate to kill hence change in calibre of assault rifles from 5.56×45 mm to 7.62×51mm. To manage cost front line troops of Infantry will be equipped with SIG716 assault rifles imported from US. India is in the process of procuring 72,400 SIG716 i.e. for Indian Army, 66,400; for Indian Navy 2,000 and for IAF 4,000. These weapons will be available very soon. To equip rest of the troops and replace INSAS contract has been signed with Russia to manufacture jointly assault rifles AK 203 in India at Korwa Ordnance Factory, Amethi. Within next 32 months or so process of equipping will complete. To supervise manufacturing of rifles senior Army officers have been deputed. As regards procurement of Carbines is concerned the case is in process with oversight Cabinet committee. The procurement of this weapon has taken too long a time and is a case study in itself. As for LMG is concerned it will also be of 7.62 x 51 mm calibre, this procurement case landed up as single vendor however, through DAC, MOD has given additional time for FTP. This is being worked at fast pace. IA is holding sniper rifles of 60s' vintage procurement of the new equipment is in the pipeline. Similarly, IA is holding ATGM of second generation; some progress is being made through Indian industry to replace it.

9. IA has a huge demand of ammunition for various weapons and Govt is looking towards the Indian Industry to pitch in. IA has to import large quantity of ammunition every year at a huge cost. At the moment there is requirement of 70 lacs rounds of AGL ammunition, MGL 40 Lacs, AMR 8 Lacs. For certain ammunition progress is being

made for procurement through TOT route. Made in India, Multimode hand grenade is being procured. It has taken 36 years to have indigenous hand grenade. RFP is being issued shortly.

10. Mobility: Number of new variant of vehicles is in the pipeline for induction and almost all are Made in India. Light strike vehicles - Trail completed, 1300 are being inducted. Light Strike Vehicles for Para units, 171 delivery will start within three to four months' time. All-terrain Vehicles small requirement is being procured. RR is processing case for procurement of MPV's. High Mobility vehicles: Required for infantry Platoon strength to move in follow in operation behind Armour. Such vehicle needs some protection to the soldiers. IA is looking for solutions from the industry.

11. Survivability: IA has procured ballistic helmets 1.58 Lacs these are NIG std 2, can protect from 9mm std shot. Now for future procurement IA looking for better protection of NIG std 3 and above, to get protection from 7.62mm std shot. Helmet at the same time has to be light. IA has procured 1.58 Lacs BPJ deliveries for the same in progress. Future procurement looking for NIG 3 Std plus and light in weight.

12. Surveillance equipment: IA needs large number of day and night sights. Earlier RFP could not be issued since type of weapons to be procured was not finalised. All new weapons will be fitted with optical telescopic holographic reflex sights. Policy for night sights has been worked out and there is huge requirement for the same. All sights to be procured have to be indigenous. IA needs the mix of II and TI sights somewhat in the ratio will be 40:60.

13. To improve Situational awareness a lot is being done; IA is in the process of getting 200 RPS shortly for additional procurement trails are in progress. Certain numbers need specific cod copters are being procured by respective Theatre Commands. IA army is also looking for BFSR particularly in short range.

14. To provide reliable secure communication IA is moving to acquire SDR enabled equipment and same being worked by Signal Dte. As for other requirements like web equipment initial procedural requirements completed. IA is also looking alternative to prismatic compass, various types of parachutes for Para units. Efforts are also on to get integrated recce and surveillance at unit level. There is lot of scope for industry to pitch in to meet as stated IA requirements. Procurement system has become transparent and as users IA has increased its interaction with industry. All possible help is being rendered and all are welcome to interact as per laid down procedures. In Infantry Dte, Industry can directly get in touch with Inf 5/8/10 for any clarification or to present product.

Panel Discussion: Examining the Essential Attributes of a Future Soldier

15. Maj Gen Ananta Bhuyan, SM, ADG RR, in his presentation gave out an overview of RR considered as PMF manned by troops and officers from IA, since its Inception. He attributed the success of RR to its soldiers, heterogeneous and modular organised structure. RR has always remained step ahead to counter terrorist design and strategy. ADG, RR then covered graphic details of shifting terrorism matrix and RR response to it. Dwelling upon attributes of a RR soldier ADG, RR stated that these soldiers are specially selected lot from IA who are physically fit, have higher cognitive abilities, communication skills, stayed networked and have excellent abilities to fight in isolation in small teams. ADG, RR then covered the technical attributes and requirements for RR soldiers. He stated that the requirement of equipping RR is similar to that of an

Infantry soldier and most of the same are met through procurement carried out by Infantry Dte. Only some equipment that is peculiar to conduct CI operations are procured by RR.

16. ADG, RR then dwelled upon the technical details and requirement of various arms and equipment for RR. For weapons the requirement is that weapons should be light weight, accurate to neutralise intended targets without much collateral damage, should be able to put heavy volume of fire when required. There is a requirement of good night vision devices which should be lightweight, have long range, good clarity and should be able to transmit what is being observed to control stations through wireless mode and most important is that it should have long operating timings. As far as day sights are concerned, RR needs good sights to improve accuracy of its weapons.

17. Surveillance equipment, requirement of more quadcopters, remotely operated vehicles and robotic surveillance platform to improve surveillance of the area particularly urban areas. To gain intelligence, there is a need to have equipment for interception and monitor IP calls which at the moment is not available and it is required urgently. As for as the communication equipment is concerned RR need communication equipment that are light in weight, should provide secure communication long range and since RR has to operate for longer period without adm backup hence needs bty backup which can sustain for longer period. Providing protection to the personal RR have got ballistic helmets however need more of these as well as need better individual protective suits which should be lightweight able to provide 80% body protection and should not impede individual flexibility. ADG RR then in his wish list added intercept equipment, better surveillance equipment like robotic surveillance platform, HMs, Snow Scooter, Corner shot weapon system, Stun grenades, better RL with no back blast.

18. Brig RR Raina, SM, VSM, BGS Assam Rifles started its talk giving out the preamble on Assam Rifles, its role as a border guarding force on Indo-Myanmar borders and CI operations in North East States. As far as the requirement of Assam Rifle is concerned, he stated that these are absolutely similar to that of Army and RR. However, Assam Rifles procurement procedures are different and friendlier being handled by MHA. While covering the core attributes of a future soldier ready to fight future wars he stated that soldier needs to have better cognitive skills, psychological resilience, mental robustness, teamwork, physical fitness, high character, integrity, honesty, loyalty and creativity. The other important attributes which a soldier should have and are non-negotiable are discipline and Esprit de corps.

SESSION 2: FIRE POWER AND NIGHT FIGHTING CAPABILITY

Chairman: Lt Gen Subrata Saha, PVSM, UYSM, YSM, VSM (Retd)**

19. While opening the session, the chairman stated that to maximize and sustain, both the requirements cannot go together as it is difficult to achieve these opposing requirements. He substantiated this statement by an example; to achieve the optimum firepower, primarily one can concentrate on its firepower and replace it with both time and space thus it may be feasible to achieve these requirements.

Essential Fire Power of a Soldier and a Sub-Sub Unit (Inf Platoon), Brig Shailendra Singh, SM, DDG Infantry Dte.

20. DDG Inf in its presentation covered various nuances of future operational environment that an Inf soldier is going to face. What are the various fire deliveries means available at the moment in an Inf Bn and how an inf soldier is being modernized so as that he is battle ready to meet the requirements of future modern war? He then gave out what are the plans of Inf Dte for equipping the Inf soldier.

21. In challenges for infantry he covered various aspects of situational awareness. Surveillance devices, command and control aspects, navigation systems, security, fire control methods. How to counter increased lethality in battlefield, use of high caliber accurate weapons, night fighting capability and in the end, he dwelled upon how to counter the NBC environment. In rest of DDG Inf presentation he covered and re-emphasized the issues which were earlier covered in detail by DG Inf, in its address which has been covered in detail in above paras. In the end DDGInf also dwell upon future battle requirements of the Inf with respect to enhancing ISR capability. He stated that there is a requirement of having good ISR platforms which needs to be AI enabled for correct situational awareness these platforms are urgent requirement for or better application of forces.

22. Chairman of the session complemented DDG Inf for a comprehensive presentation and also suggested that Inf requirements in numbers and scaling should be made readily available to industry than only they can plan for participation. If army fails to do so then it may end up buying these later ex trade.

23. Chairman also recommended to CENJOWS that there is a need to work out a philosophy for procurement of ISR platforms for all services jointly to avoid duplication and to tap solutions available inhouse and look at what space agency could provide to the armed forces.

24. Chairman while talking about lethality stated that today infantry is also planning to extend its wpn ranges to 9 kms still there will be gaps in fire support which need to be covered by different platforms and some trade platforms like Prahar could be exploited.

25. Chairman in his final recommendation spoke about SDR communication systems required by all services. He again retreated that all services needsshould be worked out together and, in this India, has in house solutionavailable from Bharat Electronics, DRDO and private sector that can be exploited which will be cheap and cost effective.

26. **Query** One of the vendors raised query regarding Inf Mor future modernization program. His query was regarding which caliber Morwpn is going to be the mainstay of Inf in future? DDG Inf clarified that 81mm Mors is going to stay and 122mm Mor is also being planned to be inducted in Inf in near future. Details regarding the same is being worked out and the environment will be informed in due course of time.

Indigenous Endeavour: Small Arms in India: Bharat Forge

27. Bharat Forge rep stated that Bharat Forge is the flagship company of the Kalyani group. This group is the Indian multinational with high technology engineering and manufacturing capability across critical assets and sectors. It has a turnover of over three billion USD. Bharat Forge is the first Indian private sector company to

manufacture barrels for guns. They have made inhouse 155 mm Arty platform 95% indigenously. The rep then further covered the details of this gun. He further stated that his company has got collaboration around the globe in defence industry and in a decade or so his company is going to be leading defence manufacturing company in the world. He stated with lot of conviction that the complete requirement of small arms ammunition for Indian armed forces can be made in house, the capability is available however procedures for procurements needs to be streamlined and proper coordination needs to be worked out between Armed Forces and private sector for the same.

Metal Injection Moulding for precision components: Sreekant Narayan, Indo-MIM

28. MIM representative in his presentation give out the defence applications of MIM. MIM is a one-stop solution for manufacturing Complex components which are used for manufacturing weapons parts and other equipment. He explained that MIM process requires a fine metal powder which is mixed with the polymer binder this mixture is granulated to form feedstock. This feedstock is heated to form viscous slurry and injection moulded to form Green Part; from that part the binders are removed through solvent the binding to get brown part. Then the brown part is densified through densified through sintering to get "Sintered Part." The representative then gave out what different types of small Complex parts which require very fine tuning for manufacturing can be made by this technology. The Chairman lauded the inhouse achievement of the company and suggested him to further collaborate with Indian companies manufacturing defence equipment.

29. Chairman while carrying out panel discussion on "Maximising Firepower and Sustainability during different operational Scenarios" stated that Indian armed forces is in the process of inducting different types of systems manufactured indigenously and imported Ex-trade the issue will come how Indian Army is going to manage such a versatile inventory? It is going to be a major task and it needs to be look into pragmatically now.

30. Maj Gen Umang Sethi (Retd) brought out that India has fought number of Wars since independence and recent inauguration of War Memorial carries the names of 25962 soldiers who laid their lives for the nation and numbers are increasing every day. It can be seen that the numbers of casualties are increasing in recent times since the battle field has become more complex and lethal. Duration of the war is reducing but the lethality has gone up. India has fought its first asymmetric war in 1971 wherein all available power of nation was put in use. 1999 Kargil war was a watershed wherein first-time firepower in mountains and the air power was utilised in innovative way. Indian Army has been fighting CI ops since 1950, anti-terrorist ops in Punjab in the period of 1980. It faced major challenge in 1987 in Srilanka where soldiers were encountered with the sophisticated weapon systems and use of complex IEDs by LTTE. To counter the threat ground level innovations were carried out by the soldiers who were effective, cheap and user friendly. Industry and today's decision makers/Planners must understand this aspect that these innovations are much faster than what can be passed top down and is the backbone of IA. In IA theatre level innovation is a way forward as brought out by DG, WE however a word of caution as brought out by Chairman that too much theatrisation may end up having too many different systems in service and inventory will be difficult to be managed.

31. The speaker further brought out that modern warfare is changing very fast and it requires short quick response to counter emerging threats. Today India is facing multi

domain warfare threat where a tactical level action will demand strategic level response as recently seen in Pulwama incident. Hence, IA equipping philosophy is to prepare to take on such emerging challenges. He also dwells upon IFF issue wherein large number of casualties does take place during operations due to friendly fire. It is a major challenge and live issue which need some pragmatic answers. One of the other important issues with IA is how to deal with the emerging challenge thrown by IW. DDG Inf brought out the issue of IFF will be sorted out once SDR equipment is introduced in IA.

**Innovative Solutions to Power and Temp Management in Extreme Climate:
Dr Sunod Mathew and Dr Vijay Maddali, Esysantra**

32. Esysantra is a Chennai based start-up company which has pioneered in energy storage solution. As per the Director Dr Vijay Maddali, the company came into being with the sincere encouragement of the present RM. The Director and the inventor of the product solution, Dr Sunod gave a presentation of their product jointly. They claimed that their product is going to bring major change the way electric power is stored. At the moment they have applied for patent of their product. The director of the company wanted support and guidance from Army so that their product could be made use of by the defence. This product called CHP device came into being with the support of IIT Roorkee. Dr Sunod elaborated that the world is moving away from fossil fuel to renewable energy sources which is available on this earth in abundance in the form of sunlight, wind and water. The issue is how the energy obtained from these natural resources could be stored and later converted into electricity for further use. At the moment Lithium batteries are very popular however these are not environment friendly and cost effective. He further stated that his start-up company has worked out and made a device which can store the energy received from various resources and then when required can convert it into electrical power and provide suitable continuous electric supply with very less wastage. He also showed a video of the concept on which their device is going to work. The Chairman lauded the work of the company and recommended that Inf Dte may move this project forward and if what is being claimed worked out it will be game changer as for as energy storage requirement is concerned.

SESSION 3: PROTECTION & SURVIVABILITY CHAIRMAN:

Lt Gen Sanjay Kulkarni, PVSM, AVSM, SC, SM, VSM, Former DG Infantry

33. The chairman while opening the session stated that there is a need to work out synergy between OFB and private defence industries. One has to understand that in defence industry investments are huge and there is also a requirement of different kind of infrastructure. At the moment the country lacks the requisite infrastructure and also a proper environment/ Ecosystem wherein in-house modern technology can be brought in through private industry to modernize Indian Armed Forces. Private Industry has got better technology solutions readily available to meet the requirement.

**Safe Communications at Sub unit and Unit Level: Col MK Singh,
Senior Dy GM, BEL**

34. The speaker spoke about the imp of communication and then brought out that his company, Bharat Electronics (BEL), has made Soldier system scope for the Army. He then gave the overview, architect and benefits of the system prepared by his company. The soldier system component consists of communication system radio: voice data and on demand video services, non communication hardware: which is wearable, vehicle-mounted and satellite-based navigation system. The system component: consists of

soldier's system application with GIS network management system and Data Base management and security solution. The key characteristics of the soldier system is that:- All Radios are SDR, two Level MANET, Gateway SDR, Multiple Waveforms to cater for various operational scenarios, Automatic Situational Awareness, Sensor Integration with on-demand Video features and BLoS communication: HF & Satcom. He then brought out that system was made available to Army for trials however, due to some reasons not accepted.

35. Chairman of the session suggested to the rep that his company may consider providing system again for trials and with proactive approach some thing could be worked out to which rep said they will again get in touch with the users.

Smart Solutions to Power Management: Increasing Power Requirements & Innovative Solutions: Debasish Dam, GM Elcomponics Technologies

36. The rep of the company stated that his company is three decades plus old with head office at Noida. The company has a turnover of 300 crore plus annually and have experience and excellence in electrical/ electronics. They are one of the largest manufacturers of electronics and electrical components for consumer durable, power electronics and industrial components in India and also exporting their products all across the globe with customers in Asia, Europe and USA. The company has got a full-fledged R&D facilities reliability testing with full technical support from the companies' technological partners i.e. Japan and Sweden. The company has got all mandated and required certification from various agencies. He stated that his company is looking forward to participate and support IA in its requirement for power solutions in particular the solar systems. He then gave a brief of its all products.

Anatomy of protective uniforms: Puneet Bhalla, AVP Honeywell

37. The rep brought out that his company Honeywell is an international MNC which has been providing body protection solution to number of armies of the world including USA. They are OEM of the ballistic material with which lighter BPJ and ballistic helmets are manufactured. The product is a fabric which is clubbed into number of layers to make protective gear which provides reliable safety from splinters and 7.62 mm bullet. He then showed the samples of the material and give detailed brief of it. He stated that the present BPJ acquired by IA is made of different material and if in future there is a need for lightweight protective solution then they may consider using his company's material. The company is ready to partner with Indian company and manufacturing of protective gear can be done within India.

38. The Chairman lauded the work of the company and recommended that the rep should get in touch with Army HQs and give presentation of his product.

Assessing Future Armour Requirements of Operational Vehicles for Protected Mobility: Mech Inf Dte

39. The rep in his presentation covered the present battlefield milieu and the requirement of protected mobility to operate in such environment. What are the global trends in this field and which vehicle to be inducted in IA is it to be wheeled or tracked?

40. While scanning the present battlefield milieu he stated that with the induction of new generation equipment the battlefield has become more transparent, the quantum of firepower has increased and is more lethal. To operate in such conditions, one has

to provide adequate protection to troops in battlefield. The future operational philosophy has to cater for fast-paced operations, shift from sequential battle procedures and the future battlefield will be dynamic in nature. The speaker gave out the design philosophy for providing protection and mobility in Indian conditions. He then covered type of equipment and vehicles the neighboring countries are having and what are the other global trends. He also brought out that for the provision of protective mobility globally there is increased reliance on wheeled platforms. He in the end, he covered briefly the requirements of IA.

Closing Remarks and Vote of Thanks: Lt Gen Vinod Bhatia, PVSM, AVSM, VSM, (Retd), Director CENJOWS.

41. In the closing remarks of the conference, Director brought out that the day's event was well organised and it provided platform to industry and the user to know each other's requirements to prepare the infantry soldiers for future battles. Many issues and ideas have been thrown during the conduct of the event which needs to be taken forward, analysed and acted upon by the concerned authorities. All stakeholders need to work together in synergy. The policy and procedures need to be changed to move fast, save resources and meet the present and future challenges for the infantry Soldier. In India, private defence industry is coming up and is capable of meeting most of the IA requirements. However, Army is required to do some kind of hand holding commitment and guide them. This is a need of the day. He further elaborated that a lot had been spoken about the present and future battlefield in which Indian soldier has to fight. Today, Inf soldier has to be prepared to switch from CI operations to conventional operations faster. The window of switchover is getting shorter day by day and hence the equipping of the soldier needs different approach. Some of the issues have been deliberated upon in various sessions and are well taken. In India R&D is another issue which needs immediate attention. Make in India projects can only succeed if Govt spends on R&D, there is no dearth of talent ideas and innovation. In the end he thanked all speaker and audience for their active participation and concluded the event with a positive note.

Take Away and Recommendations

42. The conference threw up several takeaways, which needs to be pursued by all concerned to address the urgent requirements of Inf Soldier. These are discussed in succeeding paras:

Requirement to equip Inf Soldier

43. The role of the infantry is not going to change however; it is going to be more challenging due to fast changing technology, high pace of war and more lethality. All-out effort has to be made to arm the soldier well, so that his aim can be achieved with minimum losses. However, due to various reasons IA has not been able to equip the Inf soldier as per the requirement and need. It is high time a concrete pragmatic approach is adopted to make Inf soldier battle ready.

44. Indian threat perception is very complex in nature and is both conventional and sub conventional in nature. Hence, Inf soldiers needs to be equipped to face both threats but the equipment cannot be compartmentalised i.e. separate for conventional and separate for sub conventional. There has to be an overlap and commonality somewhere as such it will be difficult to afford. This needs to be well understood. The other aspect is that modern warfare is changing very fast and it requires short quick

response to counter emerging threats. Today India is facing multi domain warfare threat where a tactical level action will demand strategic level response as recently seen in Pulwama incident. Hence, IA equipping philosophy is to prepare to take on such emerging challenges.

45. A large quantity of arms and equipment India has to import to meet its requirement which is cost prohibitive. The procedures put in place for procurement are lengthy, unwieldy and process of procurement is very slow, this needs to change and require attention as it is affecting operational preparedness and is costing lives. To cut cost and speedy assured availability of arms and equipment govt need to give conducive environment for private defence industry to grow. There is an urgent need for creating new ecosystem for the same.

46. The other reasons why Inf soldier could not be equipped as required are:-

- (a) The technology in equipping an Inf soldier is changing very fast, what is available today in three years' time it changes and something better is available hence before a system is inducted it appears to be obsolete.
- (b) Infantry numbers is large hence any addition of system costs huge amount.
- (c) Indian system to induct equipment for the soldier and to induct Tanks is same. Can such system work efficiently? May not hence need to look into.

Way Ahead to Equip the Inf Soldier

47. For the infantry soldier modernization- IA have to look at procurement cycles of six month to a year. Once an equipment or system is procured then it needs to be exploited for about five years and in the meantime say after three years or so look for the replacement as technology and operational conditions change very fast.

48. One of the strategies working well is to carry out procurement for theatre specific important immediate requirement through Army Commanders Financial fund. This model could be made more effective by allotting more funds and streamlining procedures.

49. **Ammunition.** IA has a huge demand of Ammunition for various weapons and Govt is looking towards the Indian Industry to pitch in. IA has to import large quantity of ammunition every year at a huge cost. During the course of deliberations private industry stated that they have the capability to produce Ammunition however, there is a need to streamline procurement policies and procedures.

50. **Procurement of Common Equipment.** During the deliberation it came out that the requirements of IA, RR and AR are almost similar to equip its soldiers and there is also lot of community in arms and equipment with other services. It is recommended that the common equipment and arms requirement could be worked out by one agency and then processed. It will not only be cost effective and fast but will also reduce duplication. HQ IDSA is a suitable agency for search synergized tasks.

51. **ISR Platform.** There is a requirement of good ISR platforms which needs to be AI enabled for correct situational awareness and better application of forces and the need is across all services. To achieve this there is a need to work out a philosophy for procurement of such ISR platforms jointly to avoid duplication and to tap solutions available inhouse and look at what space agency could provide to the armed forces.

52. **Communication.** SDR Communication Systems is required by all services. It is recommended that all services needs should be worked out together and, in this India, has in house solution available from Bharat Electronics, DRDO and private sector that can be exploited which will be cheap and cost effective.

53. **Management Of large Inventory.** Indian armed forces are in the process of inducting different types of systems manufactured indigenously and imported Ex-trade the issue will come how IA is going to manage such a versatile inventory? It is going to be a major task and it needs to be look into pragmatically. It is recommended that inhouse study on this issue and its effects be worked out.

54. **Interface between Industry and User.** Large number of start ups and private defence industry players are there in the country that can provide most of the requirements of the armed forces. It is recommended that a proper platform /interface be-workout where more and better coordinated interaction could be carried out with the industry and the user so that both can understand each other's requirement. Industry is also required to look at various innovations being carried out at functional level by the armed forces which will further give them an idea what would be the forces requirement in near future.