



*Lt Gen Subrata Saha, UYSM, YSM, VSM**, DCOAS (P&S)*



Lt Gen Rajiv Bhatia, AVSM, DG AAD



AIR AND MISSILE DEFENCE INDIA : 25-26 MAY 16

Prabudh Sharma



Mr Nataraj Krishnappa, Director (Other Units), BEL



Brig MKK Iyer, SM



Maj Gen S Bhattacharya, VSM, ADG Indigenisation

The 4th Air and Missile Defence Symposium was organised jointly by 'Centre for Joint Warfare and Studies' and Defstrat.com on 25 – 26 May 2016 at IDSA Auditorium. The two day event brought together the collective wisdom and experience of several military technology experts of the three services, the Indian and foreign defence industry and also serving officers from other nations. Lt Gen Vinod Bhatia, PVSM, AVSM, SM, (Retd), Director CENJOWS welcomed the speakers and delegates to the event and set out the aim of the Symposium. The seminar aimed to review the challenges of capability development and capability sustainment for Army Air Defence in the Indian context.

Drawing on his experience, Air Marshal PP Reddy, PVSM, VM, former CISC, in his opening address, spoke of the strategic imperatives of Air and Missile defence as also the need to evolve a strategy for capability development and capability sustainment through self reliance. He highlighted that the advent of air power has extended the battle space into the third dimension and has changed the very concept of war. The exponential change in the nature of air threat has made it more intelligent, accurate and highly lethal. To a large extent, rapid advancements in avionics and the evolving air threat has also driven the technology of the ground based means to address the modern day air-threat. He also discussed the mechanics and concept of Air Defence, conflicting requirements of urgency vis-à-vis design& development and the crucial issues of the procurement system.

Lt Gen Subrata Saha, UYSM, YSM, VSM**, DCOAS (P&S), spoke eloquently on 'An Overview of the Indian Ground Based Air Defence: Current Capabilities and Future Challenges'. He elucidated the three broad categories of the Modernisation Plan, viz Category I, II and III, which include conventional preparedness, sub systems to support category I and the systems existing currently on the inventory. The speaker covered the broad spectrum of threat from the air and importance of GBADWS in the present context. He stressed on the need for providing due impetus for indigenous manufacturing and the much needed transition from being a global buyer to a domestic producer.

Lt Gen Rajiv Bhatia, AVSM, DG AAD, in his Keynote Address spoke about the varied challenges of 'Modernisation of the Army Air Defence'. He stressed on the need to work out a comprehensive strategy to achieve the long term objectives of Capability Development and Capability Sustainment duly encompassing the need for 'Make in India'. The Director General gave a broad overview of the modernization plan for Army AD to include the pillars of modernization, procurements in the pipeline, up-gradation plans for equipment in service and sustenance of vintage equipment till its replacement. The DG emphasized on the importance of interaction with industry to find solutions to the challenges of sustaining the present inventory of equipment faced by Army Air Defence.

Mr Nataraj Krishnappa, Director (Other Units),



**Lt Gen Vinod Bhatia,
PVSM, AVSM, SM (Retd)**

**Air Marshal PP Reddy, PVSM, VM (Retd),
Former CISC**

BEL, covered 'BEL's role in 'Augmenting the Effectiveness of India's AD Capability'. He enumerated the various initiatives taken by BEL to address the needs of the Army AD and also brought out how BEL is constantly encouraging MSMEs to create a complete ecosystem for sustained support.

Other than the Inaugural session which set the tone of the symposium, there were four major sessions based on the pertinent issues in the Air Defence domain.

Emerging Aerial Threats & Counter Measures

Chaired by Lt Gen VK Saxena, PVSM, AVSM, VSM (Retd) former DG Army AD, the session included experts representing the Indian and foreign industry, viz, Thales, DRDL, DRDO, Saab, ADTL and RADA Israel. The speakers gave a broad overview of respective companies, their niche products and areas of research.

Patrick Mallon, Chief Technologist at Thales, UK, shared 'Global Trends in Future Missile Requirements'. He emphasised that the current systems can provide an effective overall capability using complimentary effectors, high velocity missiles for very fast, agile targets and the lighter beam riding missiles for the comparatively less agile targets. Ajit Choudhary, Head of Tactical Weapon System Group (TWSG), DRDL Hyderabad gave a fresh insight into the DRDO's contribution to augment the capabilities of Army AD. He highlighted the major contribution of DRDO for the successful production of the Akash Weapon system, which has been trial evaluated and inducted in to the Indian Armed Forces. Mikael Enkvist of Saab, Sweden gave an enlightening talk on the contemporary High Performance

Target Tracker for Surface to Air Missiles. He enumerated the details of the niche technology and its utilisation for air defence missile systems. Capt TN Pranesha (Retd) from ADTL shared a perspective on 'Role of Private Sector in Developing Indigenous Technologies for Missile Applications'. He highlighted the progress made by the company in developing a RF Seeker for missiles and gave a broad over view of their focus areas of research and products for Air Defence.



Mikael Enkvist, Saab

Yonatan Yaron from RADA, Israel, enumerated the contemporary advanced air defence radar technologies developed by RADA and their focus areas of research for air defence application. He emphasized the niche technology of their air defence radar sensors which could also be utilised for provisioning of local warning and their utilization as a fire control radar.



Yonatan Yaron, RADA

Air Defence Guns and Ammunition; Achieving Self Reliance in Air Defence

Chaired by Lt Gen Kuldip Singh, PVSM, AVSM (Retd) former DG Army AD, the session included experts representing the Indian and foreign industry, viz, Bharat Forge Ltd and Premier Explosives Ltd. It was followed by a panel discussion on Capability Development and Self Reliance. Col GNM Rao (Retd) of Bharat Forge spoke on the emerging trends in the gun technology, the focus areas of research and niche Air Defence products of Bharat Forge. Dr AN Gupta from Premier Explosives Ltd (PEL) shared his perspective on 'Make in India- the way forward for Missiles & Ammunition'. The speaker highlighted the success story in development of an indigenous Air Target



Patrick Mallon, Thales



Capt T N Pranesha (Retd), ADTL



Dr AN Gupta, CMD Premier Explosives Limited

Claes Trulsson, Saab

Ajit Chaudhary

Imitator for Air Defence which is a critical requirement for training of AD operators of the three services on firing of heat seeking missile systems.

Panel Discussion on Capability Development and Self Reliance. Chaired by Lt Gen JP Singh, PVSM, AVSM (Retd), former DCOAS (P&S) and the panelists included Maj Gen S Bhattacharya, VSM, ADG Department of Indigenisation, Rear Admiral Philipose G, NM, ACNS (Air), Rahul Chaudhry, CEO, TATA Power SED and Prabudh Sharma, Associate Editor, defstrat.com. The ACNS (Air) highlighted the present inventory of Air Defence weapons and the planned acquisitions in the near future by the Indian Navy. ADG Indigenisation Cell brought out the nuances of sustaining the equipment for over 4 to 5 decades and the importance of incorporating the Life Cycle Costing of equipment in all procurement cases. He stressed on the need for management of multiple vendors which could go upto 30 to 40 in some cases and commence the indigenisation process at the contract stage of acquisition itself. Rahul Chaudhry stressed the need to change from the Sustenance Model to Life Cycle Support concept, which would entail the industry providing an efficient maintenance support through the life cycle of equipment rather than having a mammoth maintenance organization. He enumerated the urgent need for a paradigm shift in dealing with high technology absorption in the defence forces and the need for the services to utilise industry's capabilities for developing and providing state of the art equipment. Prabudh Sharma elucidated the critical technologies required to be indigenously developed for achieving self reliance in the domain of Air Defence. The panel discussion highlighted the importance of Make in India towards attaining self reliance and the vital need to evolve a realistic financially sustainable model for indigenous development of equipment by the defence industry.

Make in India: Incubating Future Air Defence Technologies

The session was chaired by Maj Gen AK Mehra (Retd), former

ADG WE with industry representatives from Saab, Premier Explosives Ltd, RADA, Israel and Col KV Kuber, Independent Consultant and Policy Expert. The Chair spelt out the context for the session by defining the contours of the dynamic air threat and the need to evolve a strategy for capability development and capability sustainment.

Claes Trulsson of Saab, Sweden gave an overview of the 'Contemporary AD Fire Control Radars Technologies' developed by Saab. He highlighted the focus of research as well as various niche Radar Systems developed by company which is a world leader in the field of Air Defence technologies. Dr AN Gupta, CMD, Premier Explosives Ltd spoke on the 'Development of the Indigenous Air Target Imitator System' for training of missile operators. While conveying the extensive research work which went in for development of the target system he expressed that the company has the capability to develop any product in the field of explosives for the three Services.

Yonatan Yaron, RADA, Israel gave a perspective on the challenges faced by air defence planners with respect to Anti-UAV operations based on the classification of various UAVs their range & weight and the counter measures required. He brought out the capability developed by his organisation which is a modern system comprising of a UAV detection system, an Electro-Optical tracking system and a directional RF system to neutralise hostile UAVs.

Col KV Kuber (Retd), Independent Consultant and Policy Expert gave a spirited talk on 'Make in India' and the provisions of DPP 2016. The speaker highlighted the evolution of DPP over the years and the remarkable features of DPP 2016 to provide a fillip to the 'Make in India' policy.

Capability Sustainment and Modernising Legacy Systems

The session was chaired by Lt Gen JP Singh, PVSM, AVSM (Retd), Former DCOAS(P&S) with representatives from services as well as industry. The session was followed by a panel discussion on 'The Challenges of Sustaining Legacy Systems'.



Brig MKK Iyer, DDG (Equipment), Army AD, presented a User's perspective on the challenges faced for 'Capability Sustainment and Obsolescence Management' of the equipment presently on the inventory of Army AD. He enumerated the measures being implemented to ensure that all legacy systems remain serviceable with the assistance of the Department of Indigenisation and support of the defence industry. Anil Kumar, DGM responsible for Refurbishment of Missiles at BDL gave a comprehensive talk on the technologies required for Upgradation and Refurbishment of AD Missile Systems.

Maj Gen S Bhattacharya, VSM, ADG Department of Indigenisation elucidated the indigenization process for components of vintage equipment and the nuances involved. He stressed the need to adopt an outreach program with a vendor friendly approach, involving MSMEs with the main focus of achieving the optimum levels of indigenization.

Panel Discussion on Sustaining Legacy Equipment

Chaired by Maj Gen S Bhattacharya, the panel included Brig MKK Iyer, Col KV Kuber and Capt TN Pranesha (Retd) from ADTL. Iyer enunciated the challenges faced in sustaining legacy equipment and measures adopted to enhance the life of vintage equipment. Col Kuber highlighted the dilemma of undertaking upgrades and problems faced by the industry in terms of R&D costs incurred with no surety of achieving repeated supply orders. Capt Pranesha of ADTL, elucidated the challenges faced by the industry in undertaking upgrades and its financial viability. He recommended a collaborative approach with the OEMs for successful execution of such projects in due consultation with the user fraternity.

The Seminar concluded with a Valedictory Address by DG AAD. The DG AAD, stressed the need for a collaborative and innovative approach with the industry to usher indigenization under the Make in India initiative to achieve the key objectives of capability development and capability sustainment. In his very spirited conclusion he appreciated the efforts made by MSMEs



Col KV Kuber (Retd)

and quoted an example of PEL for successful production of the 'Air Target Imitator System'. Director CENJOWS in his Vote of Thanks exhorted the AAD fraternity to consolidate the 'Take aways' of the seminar and expressed full support from CENJOWS for projecting issues to the policy makers at appropriate levels.

In conclusion

- Change and adoption of new technologies is essential but would not be an overnight phenomenon. Existing equipment and processes need to be upgraded.
- Indigenous defence production requires a more collaborative integration with the users providing a platform and resources to field the system through trials and improvements. This should be seen as a measure to improve national capability and not as a cost to the forces.
- New systems had to be tailored to meet specific needs and budgetary constraints. It was not necessary to use what was proven elsewhere if the threat assessment did not justify a payback.
- Technology available in the country was needed to be identified by the users and measures instituted for their induction.
- Symposia such as these would help bridge the gap between users and the technology providers to the advantage of both. [SA](#)