Centre for Air Power Studies (CAPS)

Forum for National Security Studies (FNSS)

Title: **AIRBORNE WARNING AND CONTROL: A BACKGROUND**

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Airborne Warning and Control System (AWACS) is among the most technologically advanced force multipliers acquired by the Indian Air Force (IAF). For optimal utilisation of such a platform its characteristics and limitations have to be clearly understood. The weekly Fellow's Seminar titled, "**Airborne Warning and Control: A Background"** on February 16, 2016, provided the essential information on this versatile platform. It covered the development, history and the roles envisaged along with its advantages and limitations.

The presentation was a part of the overall project on "AWACS: Challenges and path ahead" and was focused on giving background information and an overview of the AWACS, with a historical account of the utilisation of airborne platforms to achieve information about the enemy's order of battle (EOB) and also for control of airspace. Initially, balloons were utilised and subsequently ground radar systems were developed to give advance information on the incoming air-raids for undertaking interceptions. As a logical outcome of the development, the system was thereafter developed for mounting it on an airborne platform and was termed as the AWACS.

The term Airborne Early Warning (AEW) was coined for early systems which provided the invaluable advance information about incoming air raids. Rapid advances in the technology thereafter made it possible to control the actual interceptions from the airborne platform and this system was called Airborne Early Warning & Control (AEW&C). The present AWACS platform can be used in both offensive and defensive roles and also has intelligence gathering capabilities- SIGINT, COMINT and ELINT. The AWACS can undertake network centric battlefield management and control functions utilising the IFF mode and the encrypted data mode. The AWACS has a rapid redeployment capability between various theatres of war, and in addition, it has a very high on-station time giving it a high degree of flexibility. The Defence Research & Development Organisation (DRDO) has developed indigenous 240-degree coverage radar which has been fitted on three smaller Brazilian Embraer-145 jets. The Defence Acquisitions Council (DAC) has also approved the building of two AWACS, which will involve mounting indigenous 360-degree coverage AESA (Active Electronically Scanned Array) radars on Airbus A-330 wide-body jets. However, the AWACS has certain limitations and vulnerabilities which include the high initial response time and base dependency along with the compatibility issues with the types of aircraft to be controlled. The advantages of this formidable force multiplier, however, far outweigh the limitations and high cost of the system.

The AWACS provides the necessary battlefield transparency to the commander. The Chinese are already using a similar aircraft as an airborne command post. The asset is also vulnerable on ground, as evidenced by the militant attacks on Kamra airbase in Pakistan. The indigenous AWACS project, the 'Airawat', was basically a technology demonstrator. The limitations of AWACS would need to be supplemented by the ground based systems and multi-sensor fusion would be required for optimum operational efficiency.

The possibility of unmanned as well as armed AWACS and that of replacing the system with a satellite based system brought the focus on future advancements in the field. A look at how countries with limited strategic depth are effectively deploying AWACS systems is germane to the study. AWACS projects have proliferated all over the world and the Australian "Wedgetail" programme is also relevant. Data linking of Unmanned Combat

Aerial Vehicles (UCAVs) and provisioning of Directed Energy Weapons on board is also the direction in which technology is likely to evolve.
