

Conquering the Skies: A Deeper Dive into Suppression of Enemy Air Defenses (SEAD)



During October 2023, the Pakistan Air Force (PAF) as part of its 14-nation Sindh-Shield 2023 air exercise reportedly carried out simulated attacks on Indian air defense (AD) sites using JF-17 armed with Chinese made CM-400 anti-ship missiles in concert with newly acquired J-10s and Airborne Early Warning and Control (AEW) aircraft. It effectively attempted to validate the use of JF-17 and CM 400 combination as a tool of Suppression of Enemy Air Defenses (SEAD) and Destruction of Enemy Air Defenses (DEAD) against Indian AD capability which has been bolstered after the recent induction of the S-400 Triumf surface to air missiles (SAM). In the modern age of warfare, where air dominance often acts as a key determinant of victory, SEAD assumes a pivotal role, demanding meticulous planning and precise execution. This is becoming more relevant as complexities of the modern day battlefield are increasing with each passing day.

The present day battlefield is a complex and dynamic environment characterised by several crucial complexities and attributes. The complex and dynamic nature of the battlefield is connected with technological advancements in several directions.

• **Increased Connectivity and information sharing:** The use of information and communication technologies (ICT) have become more widespread, which has resulted in the creation of a highly networked battlefield environment. Further, the information capture by assortment of Intelligence, Surveillance and Reconnaissance (ISR) resources and sharing increases battlefield awareness. Despite the fact that this makes it possible to improve

coordination and make decisions more quickly, it also leaves the organisation open to the possibility of cyberattacks and electronic warfare (EW).

• **Longer Range Precision Warfare:** Developing and deploying sophisticated weaponry, such as laser-guided munitions, guided missiles, and drones, has made it possible to carry out attacks with pinpoint accuracy from increasingly expanding range while causing as little collateral damage as possible. At the same time, the pre-emptive strikes carried out from long ranges with precision attack munitions always have the possibility of deviating from the intended flightpath and sometime striking unmarked areas. It necessitates application of appropriate targeting techniques to prevent collateral damage especially while targeting areas closer to civilian population. This is primarily relevant with precision strikes carried out using unmanned aerial vehicles (UAVs).

• **Autonomous Systems:** The increasing use of autonomous systems, including unmanned aerial vehicles (UAVs) and ground robots, offers significant advantages in terms of reduced risk to human personnel and increased situational awareness. Add to it the capabilities offered by loitering munitions and swarm drones. Use of ICT and long range precision strike capability have added greater lethality to autonomous systems as sought-after tools of war-fighting.

• **Cyber Warfare:** Militaries have become more susceptible to cyberattacks as their dependence on ICT and networking has increased. These types of attacks have the potential to interrupt communications, damage crucial infrastructure, and even influence weapon systems