Editorial Note

It is with pride and a profound sense of satisfaction that I would like to bring to the notice of the growing list of our readers that the '**Blue Yonder**', the Centre for Air Power Studies' (CAPS') fledgling journal on aerospace power, has successfully completed one year of its existence. In its second year, it would be our endeavour to further enhance the quality of our articles and discourse on contemporary aviation issues.

The year 2025 began with the widely anticipated return of President Trump to the White House on his election plank of 'MAGA - Make America Great Again'. A number of steps have been initiated by him, which are aimed at reviving the manufacturing sector in the US, revamping the world trade order, reducing in US commitments to multilateralism, and enhancing the defence budgets of its allies and partners so as to cut down on the US' global security commitments.

In spite of President Trump's efforts to broker deals in Ukraine and Gaza, the Russia-Ukraine War continues to rage on even after 1,200 days of the conflict, and likewise, the Israel-Hamas conflict, also continues to simmer. In fact, on June 1, 2025, the Ukrainians carried out an audacious, ingenious, intricately planned and co-ordinated drone attack, code-named Operation Spider Web, on five Russian airfields housing Russian strategic bombers, deep inside Russian territory. The coordinated drone attack caught the Russians totally by surprise and resulted in destruction of/

damage to a large number of Russian strategic bombers. This highly successful Ukrainian drone attack has hardened the Russian anti-Ukrainian stance and further diminished the chances of a negotiated settlement.

On April 22, 2025, five terrorists of 'The Resistance Front' (TRF), an offshoot of the Pakistan-based Lashkar-e-Taiba, carried out a dastardly, heinous terrorist attack on unarmed Indian tourists in Pahalgam and killed 26 of them, including one Nepalese national, in cold blood. In response, on May 7, India carried out a calibrated, measured and non-escalatory strike on nine terrorist training camps/infrastructure in Pakistan Occupied Kashmir (PoK) and Pakistan. No military or civilian targets were struck. India offered Pakistan an off-ramp specifying that if Pakistan did not respond, this could be stopped. However, Pakistan chose to escalate and struck Indian civilian and military targets. India, therefore, responded with strikes on the Pakistan Air Force (PAF) Air Defence (AD) radars and PAF air bases. The ferocity and precision of these attacks was such that Pakistan was forced to ask for a ceasefire from India in less than four days (88 hours). Op Sindoor was a phenomenal success for the Indian armed forces and has established a new normal in India's kinetic response to terror.

The third issue of this journal covers a diverse array of topics ranging from the domains of aerospace, cyberspace and technology. The article "**IoBT In India: A Race Towards Operational Supremacy**" brings out the significance and composition of the Internet of Battlefield Things (IoBT). IoBT would facilitate real-time communication and synchronisation between the inter-connected combat elements. Artificial Intelligence (AI) and Machine Learning (ML) are leveraged by the dense network of sensors for real-time data analysis and decentralised decision-making by the command and control systems, even in the restricted or contested Electro-Magnetic (EM) spectrum. The incorporation

of IoBT into the battlefield would significantly transform military operations by enhancing situational awareness, eliminating the fog of war, facilitating decision-making in real-time and providing tremendous benefits in tactical surveillance, resource allocation, and logistical planning.

The article "**The Emerging Role of Drones in Shaping Present and Future Conflicts**." articulates that the rapid advances in aviation technologies, low cost of Commercial Off The Shelf (COTS) components, combined with the miniaturisation of weapons has led to an increasing utilisation of drones in combat roles during conflicts. Drones and loitering munitions have emerged as ideal weapons of choice for asymmetric warfare, especially in hybrid and grey zone warfare. The easy availability, scalability and cost-effectiveness of drones have 'democratised' air power and made drones an indispensable tool for poor nations and even non-state actors, thereby altering the strategic balance of power. However, drones are still vulnerable in contested air defence environments. In spite of their vulnerability, all nations are revamping their existing air power tactics and strategies to include usage of drones. In all future conflicts and wars, drones would continue to evolve, become more lethal, and increasingly take on a larger number of roles of the manned aircraft.

The article "**Air Denial: *Pis Aller* to Counter Power Differential**" emphasises that the primary objective for application of air power is to gain and maintain a degree of 'control of the air', which, in turn, facilitates operations in the land, sea and air domains. However, during conflicts of unevenly matched nations, the weaker nation would not possess the resources and capabilities to be able to achieve 'control of the air'. In such scenarios, the nation with the adverse power differential may choose to focus on denying the enemy 'control of the air' rather than aiming to gain 'control of the air'. There have been several instances in the past when the weaker nations have employed an asymmetric

application of air power through air denial to prolong the conflict and achieve their limited political/strategic objectives.

The article "**Warfare Without Borders: An Era of Asymmetric and Cyber Warfare**" articulates that modern warfare has evolved and apart from actions on the conventional military battlefield, it also encompasses actions in the economic, diplomatic, cyber, psychological and information domains. Hybrid warfare has become the most preferred mode of warfare and comprises both conventional and non-conventional methods. Asymmetric and cyber warfare are the primary facets of hybrid warfare, and are being increasingly utilised due to the relatively lower costs. The article brings out the important facets of cyber and asymmetric warfare and the steps to be taken by the IAF to protect its infrastructure against asymmetric and cyber attacks.

The article "**Enhancing Cyber Security and Asymmetric Warfare Capabilities: Strategic Imperative for Air Forces**" highlights that air forces around the world are increasingly being subjected to cyber attacks and asymmetric warfare attacks by non-state actors. The enhanced reliance on digital networks by air forces is being exploited by these non-state actors. Air forces need to be ahead of the curve and harden their infrastructure, adopt robust cyber security measures and develop methods to counter the asymmetric threats.

The article "**Air Power Over the High Seas**" emphasises the importance of the Indian Ocean Region (IOR) for world trade on account of the busy and crucial maritime trade routes in the region and also its importance for India's maritime and economic security. The article articulates the military and security challenges faced by India and other nations in the IOR. The article proposes that the Indian Air Force (IAF) needs to increase its presence in the region, with the basing of a larger number of maritime assets. The IAF also needs to enhance strategic engagements with other air forces in the region for addressing the persistent problems

of drug smuggling, illegal fishing and piracy. The article also brings out the need for India to establish/extend its Air Defence Identification Zone (ADIZ) in the region for ensuring better situational awareness and a free and open Indian Ocean, which would foster shared prosperity for the nations of the IOR.

The article "**Supply Chain Challenges in India's Space Sector"** highlights the major supply chain bottlenecks faced by the Indian space sector over the years. Fragmented domestic manufacturing, limited production capacities and heavy import reliance for critical parts like advanced semiconductors and sensors have been some of the major roadblocks in the growth and development of the Indian space sector. Access to cutting-edge space technologies has also been denied or delayed by the Western nations due to vested interests and geopolitical tensions. Restrictive and cumbersome rules and regulations have prevented the private sector and startups from participating in the space sector. The Indian government needs to expeditiously address the bottlenecks to enhance growth in the crucial space sector by encouraging indigenous Research and Development (R&D) and public-private-academic collaboration.

The article "**Securing Rare Earth Metals for India's Aero-Engine Indigenisation"** analyses the availability of Rare Earth Metals (REMs) in India, their extraction, processing and manufacturing of the rare earth permanent magnets and end-products that are critical for the production of electrical batteries, electrical vehicles, motor vehicles and aircraft. The article also emphasises the critical roles played by the REMs in aerospace and defence technologies, particularly in the development of high-performance engines, electric propulsion, surveillance and navigational aids, precision guided munitions, missile guidance systems and naval propulsion systems. Therefore, a stable and sustainable supply chain of REMs is extremely important for ensuring national security. To overcome the shortage in the

availability of REMs, India is planning to focus on international collaborations for diversifying global supply chains, in the short term. However, in the long term, India plans to scale up domestic mining, refining and production of REMs so as to achieve *Atmanirbharta* in this critical requirement.

The article "**An Air Veteran's Perspective**" has two parts. Part I of the article "**Lessons for Air Power: Learning from the Past and Ongoing Conflicts**" highlights the various air power lessons learnt by the Americans and their allies from the conflicts in Kosovo, Syria, Afghanistan, Libya and Iraq. The article also elucidates that the Russians and Chinese have focussed on acquiring Anti-Access, Area Denial (A2AD) capabilities based on an in-depth analysis of the Western air campaigns. The article also emphasises that in all future wars, gaining dominance over the space, cyber and EM domains would be critical for success and, additionally, *Atmanirbharta* or self-reliance, especially in weapons, would be essential for prosecuting a successful operational campaign. Part II of the article, "**Technology Infusion into the IAF**' brings out the tremendous significance and implications of AI and other emerging technologies like quantum computing and robotics on the conduct of military operations, especially multi-domain operations. The article also highlights the ethical concerns of fully autonomous weapon systems regarding targeting decisions without human interference. The article concludes that the IAF needs to embrace the transformative and ever increasing capabilities of AI to harness its combat potential and ensure peace and security in the region.

I hope that this journal would continue to receive the attention, suggestions, affection and blessings of the highly discerning aerospace community, which would motivate us to scale greater heights of research and scholarly excellence. Contributions and feedback from the readers of this journal are highly welcome and encouraged; suggestions for improving this journal for the

air and space power community can be sent by email to CAPS at editorBY@capsindia.org or capsnetdroff@gmail.com.

Wishing you all enjoyable reading and happy landings.

Air Vice Marshal **Ashish Vohra**