EDITOR'S NOTE

As the Russia-Ukraine conflict lingers on and enters the tenth month, there are estimates that indicate over 40,000 fatalities, many more injured, 14 million displaced, huge damage to buildings and property amounting to over $100 billion, and many people left homeless. That is huge cost to life and livelihood. Russia had taken control of 42,000 sq km of Ukrainian territory, including Crimea, Donetsk, and Luhansk before 2022. It had occupied 119,000 sq km by March 2022 after the recent invasion. Effectively, it meant 27 percent of total Ukraine. Now, the Russian offensive has got bogged down. Russia suffered a major defeat in south Ukraine when it was forced to withdraw from the western Kherson region. This was a major setback for Russia. Ukraine claims to have retaken nearly 10,000 sq km from the Russian occupation forces.

Russia has been forced to resort to fresh recruitments, and employing contract soldiers, offering as much as $3,000 a month as an incentive. Russia also approached Afghanistan's National Army commandos who were out of jobs when the West left Afghanistan. While China and India have greatly increased oil off-take from Russia and, in turn, neutralised the loss of sales stopped by the Western sanctions, the Russian economy is finally feeling the pinch. Yet the rouble remains strong against the dollar.

Cutting off of Russian gas supplies to several European countries has caused shortages and especially impacted some poorer Central and East European countries that are struggling to see through the spiralling energy prices. Also, deliberate or unintentional Russian attacks have damaged many nuclear power plants or rendered them partially operational. This has caused serious power supply shortages and most of Europe heads towards a severe winter.

The Ukraine conflict has changed the security dynamics in Europe for years ahead. The North Atlantic Treaty Organisation (NATO) is getting expanded. The defence budgets are going up and countries will be forced to pull out money from social benefits that will impact lifestyles for many. More countries will, of course, look at alternative sources like renewable energy. Many new weapons have been deployed and used in the conflict. The last bullet has still to be fired. Many of the initial lessons learnt in the war have been upturned.

The second security focus area remains the Taiwan Strait. The 20th National Congress of the Chinese Communist Party (CCP) held in October 2022 has further consolidated the power of General Secretary Xi Jinping, giving him the unprecedented third term till 2027. With greater power, he could be more aggressive in China's unfinished agenda of annexing or reunifying Taiwan. Lessons from the Ukraine conflict indicate that China will be more cautious. Taiwan has very strong defences. Also, the level of American and Japanese commitment and support will be much more. Beijing cannot afford the world coming down heavily on it. The Zero-COVID policy, the worsening demographic profile, the slow-down or cancellation of many Belt and Road Initiative (BRI) projects are all slowing the Chinese economic growth. Workers at the world's largest iPhone factory in central China's Zhengzhou city resorted to violent protests against tough COVID-19 restrictions. Many Western firms are relocating out of China. Beijing is, thus, not ready for another economic shock. Insiders still believe that engineering a pro-China political change in Taiwan will be much more in line with the Sun Tzu doctrine of winning wars without firing a bullet.

American pressure has pushed Russia into the Chinese arms. As they draw closer and coordinate strategically, there will be implications. Russia could also partner with China in the Indo-Pacific where the Quadrilateral Security Dialogue (QUAD) and other American partners are stronger, both economically and militarily.

Technology is another area of action. The key technologies that are evolving most rapidly and will impact all walks of life in the coming years,

include data sciences, artificial intelligence and machine learning, robotics, 6G communications, virtual reality and augmented reality, blockchain and cyber security. Hypersonic weapons have already been used operationally in Ukraine. Hypersonic flight will be evolving next.

The National Aeronautics and Space Administration's (NASA's) ambitious Artemis programme has begun unfolding. Humanity is now all set to go and establish a liveable base on the Moon and to search for, and exploit, resources, and dig for water, using innovative technologies. The plan is to have a long-term presence on the Moon. The Moon could then be the launch base for manned missions to Mars.

The threat and risk of use of nuclear weapon hit an all-time high during the Ukraine conflict. There is, thus, a need to revisit nuclear arms control, reduce risks and strengthen deterrence. Nuclear proliferation and arms control need further checks and balances.

The world has started realising that climate change must reshape the development narrative. Advanced industrial nations, especially in Europe, are getting more focussed on climate related issues. Multilateral financial institutions are all looking at the climate impact of projects before clearing project funding. How and what will affect droughts, water shortages, crop failures, and refugee crises are being analysed and discussed.

Personal data has become a resource to tap. Many are doing it unscrupulously and invasively for commercial promotion purposes. Data is also being used by authoritarian governments to squash dissent and root out opposition. Personal data protection has, thus, gained significance.

With the world going increasingly digital in all its activities and dealings, cyber security has assumed greater importance. Cyber attacks for paralysing networks and intellectual property theft have become issues requiring protection. Cyber attack has also become a political and military weapon. The academia and industry are engaged in development of technologies to defend from cyber threats.

This issue of *Air Power Journal* looks at more contemporary issues. Air and space related technologies continue to advance in speed, range and

precision. Aerospace remains the dominant means of prosecuting offensive and defensive operations. Air power's unique operational characteristics in the multi-dimensional environment that offer a very broad range of strategic and tactical military options including lethality, responsiveness, versatility, and flexibility need to be exploited by every nation. India, thus, needs to continue to invest more in air and space assets.

An author looks at the emerging trends in warfare, and how to strategise for the next decade. Clearly, emerging technologies are driving the way wars will be fought or deterred in the future. New developments in data processing, quantum computing, artificial intelligence, and robotics are making dramatic changes in the way wars of the future will be fought. States have also to contend with non-state adversaries. Grey zone operations, hybrid and asymmetric warfare are all being technology driven. Autonomous systems, hypersonic weapons, and directed energy weapons are areas of action. India must leap-frog into the new technology areas to become a significant global power.

The military lessons from the Ukraine War continue to evolve. Despite high asymmetry in force levels, wars are unlikely to be short and swift. The military has to prepare for the long haul, with matching logistic chains. The vulnerability of the armour tanks and logistics convoys to Kamikaze drone attacks has been exposed. Large ships are vulnerable to sea-skimming cruise missiles. Use of large Unmanned Aerial Vehicles (UAVs) in high-threat contested environments has limitations. Long range precision weapons will be increasingly required. Man-portable Air Defence (AD) weapons are highly effective and can significantly ensure air space denial. Battle fatigue has to be factored in and troop rotation evolved.

Multiple Independently-targetable Reentry Vehicles (MIRVs) are the next players in the nuclear deterrence dynamics in South Asia. China already has MIRV capability and it also has hypersonic weapons. Pakistan's Ababeel surface-to-surface Medium Range Ballistic Missile (MRBM) reportedly can carry MIRVs. India is developing MIRV capability to counter the growing

and modernising nuclear arsenals of China and Pakistan. The Agni-V and Agni-P are likely to incorporate MIRV technology.

The New US National Defence Strategy for 2022 has been unclassified. The main emphasis is on the Russian and Chinese threats. Iran and North Korea are also mentioned. The document covers force planning and capability building. There is mention of the need of, and approach to, strategic partnerships, and regional alliances. Military technologies and joint warfare are areas of focus. We have an author who has written on "Integrated Deterrence: Understanding the New United States' Defence Strategy."

Lastly, there is an article on India's readiness for unmanned aerial warfare. The world has been drawing lessons on the use of Unmanned Aerial Systems (UAS) from various wars since Iraq and Afghanistan. More recently, drones have been employed in a contested environment in the Azerbaijan-Armenia conflict and the Ukraine War. UAS development and induction has become a top priority in India.

We cover all these and more in this issue of our *Air Power Journal*.

Happy Reading!

Jai Hind!

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