EDITOR'S NOTE

The war in Ukraine continues, with the Russian ground offensive somewhat bogged down. It took a few months for Russia's Wagner mercenary group to capture the Ukrainian city of Bakhmut. While the ground offensive, especially in the cities, continues to be discussed in the form of tactical detail and lives lost, the bigger global debate is about the use of air power, its successes, and failures. The importance of air power has got further underscored with President Zelenskyy seeking MiG-29s from the East European nations initially and now insisting that the US give them the F-16 class of fighters.

The success of air power in the Arab-Israeli Wars, the two Gulf Wars and Kosovo has been well documented. With the very high air asset asymmetry between Russia and Ukraine, it was initially expected that the Russian Air Force (VVS) would be able to achieve total air superiority very early in the war and that would support a *blitzkrieg* kind of ground offensive. The same did not happen. Also, as Ukraine received more Western air defence systems, Russia started losing aircraft and was forced to maintain distance and use more expensive cruise missiles and other stand-off weapons. Effectively, Ukraine had forced air denial on the Russians. Conversely, Russia had destroyed most of the Ukrainian aircraft.

Russia failed to capture Kyiv in the first phase that lasted till April 2022. The Russian convoy coming on a single axis got bogged down and Ukraine could knock it down, thus, forcing a rethink and withdrawal. The initial success of Ukrainian Man Portable Air Defence Systems (MANPADS) like the Igla and Stinger, pushed Russia on the back foot. Even the attempted airborne landing also got neutralised. Russia had deployed only around 300 combat aircraft out of an inventory of close to 3,000. These faced

about 80 Ukrainian fighters. Ukraine dispersed its assets well. The Russian campaign to target air defence assets, air bases, command-and-control centres, ammunition dumps, troop assembly areas and industrial targets lacked concentration of force and coordination. Russian targeting and battle damage assessment remained in question. In short, the Russian campaign was large neither in scale nor in effect.

Ukraine did make innovative use of the Turkish TB-2 armed drones initially, though these too got neutralised later. The reconnaissance support from the North Atlantic Treaty Organisation (NATO) was a big help for Ukraine. Russia's reputed offensive electronic warfare, while being effective initially, also jammed its own systems which were operating in similar frequency bands as the Russian supplied Ukrainian systems. Notwithstanding, the Russian S-300 and S-400 units did down Ukrainian aircraft. Ukraine's sinking of the Russian cruiser *Moskva* using cruise missiles was due to a big tactical blunder by the Russian Navy, and had a great demoralising impact on the Russians.

In the absence of air superiority, the character of the entire military campaign changed. Over and above the Ukrainian air defences, analysts have questioned the physical employment of air power itself. Russian air power should have been able to target and stop such huge quantities of Western military aid flowing into Ukraine across its land borders. This would have been possible if Russia had control of the skies, and had carried out air interdiction of the lines of communication. The Russian air strikes were limited to less than 300 km deep. Ukraine is a large country and should have been struck much deeper to hit logistic nodes and supply chains close to its western borders.

Russia's excessive concentration on targets such as electricity generation and other infrastructure did not achieve the desired results to demoralise the Ukrainian population. Even after firing over 4,000 cruise missiles, the impact was not sufficiently visible. The Russian air power's inability to blunt the Ukrainian counter-offensive in Kharkiv and operations in Kherson indicated the Russian operational limitations.

Russia is facing high casualties because it has not been able to neutralise the US supplied 155 mm howitzers and High Mobility Artillery Rocket System (HIMARS). Also the US had provided more offensive hardware, such as the AGM-88 Hight Speed Anti-Radiation Missile (HARM) and 500-pound Joint Direct Attack Munition (JDAM) extended-range guided bombs. Destroying these was more important than hitting the public utility buildings. Even the Iranian kamikaze drones and Russian stand-off cruise missiles did not succeed in this task. While the drones were very effective initially for both sides, their success was perhaps overhyped, and soon counter-measures were evolved and usage reduced.

The air policing support and target intelligence inputs from NATO did help Ukraine. And NATO could do this without overflying Ukraine, or getting directly involved. Russia's first priority should have been to target Ukraine's integrated air and missile defences, which continue to work even after nearly one year and five months of conflict. Interestingly, both Russia and Ukraine have lost similar numbers, nearly 60 aircraft each. The few MiG-29s received by Ukraine from the East European countries were not of much use, even though some had been modified to carry Western missiles.

The fact that Russia had to resort to mid-war recruitment and use a mercenary group to fight the ground war also indicated the limitations of the second most powerful military. It also indicated significant loss of troops. It was expected that Russia's offensive around Bakhmut would cause shock and awe, but the same did not happen.

It appears that unlike the US which prepares and uses air power for global dominance, the Russians use it more for defence of the homeland, and, therefore, the limitations of its offensive capability and usage. Russia is known to have only around 9 Airborne Early Warning and Control (AEW&C) aircraft, and around 15 Flight Refueller Aircraft (FRA). Similarly, Russia has very few airborne or satellite-based Intelligence, Surveillance, Reconnaissance (ISR) platforms. All this is indicative of the limits in offensive intent or global reach. Some analysts feel that the Russian air campaign was more army-thinking-led and ground force-centric. The fighter-bombers were

not engaged in real offensive tasks in contested Ukrainian territory. The air force should have run an independent air campaign, which would have accrued greater benefits to the surface campaign.

Without very active US participation, it is doubtful if just the European countries would have been able to provide support against the Russian might and made the war more one-sided. The Ukraine conflict has also galvanised NATO. Like in Vietnam, the might of US air power had been put to question in achieving its aim, in Ukraine, the might of Russia's air power and its ability has been put to question. Meanwhile, the spring counter-offensive of Ukraine seems indefinitely delayed, or may never happen.

The US has pumped in more than $45 billion so far in military aid, and its allies have also chipped in large sums, mostly in defensive systems. The supply of F-16s will invoke a Russian reaction, and their air base in Ukraine is likely to be targeted on their arrival. The Russian president's resolve to fight and succeed is strong and the Russian armed forces are no pushover. They already hold 20 per cent of Ukrainian territory. They may finally succeed in their political goals, which, however, have not been clearly spelt out. The last bullet has still to be fired, and the end state is not very clear. With the West deciding to take on Russia, and China already flexing its muscle in the East China and South China Seas, the dual containment strategy puts limits on the West.

This issue of *Air Power Journal* looks at important contemporary geo-strategic and technological issues. The risk of use of a nuclear weapon by Russia in Ukraine has increased. We look at Russian nuclear weapons, and their capabilities and modernisation. Derived from Soviet strategy, the Russian bastion defence concept is composed of a mix of air defence, sea denial and coastal defence systems that ensure the survivability of nuclear-powered ballistic-missile submarines for patrols and operations in the region. We assess this strategy. We also look at the Russian rare earth industry and why despite high reserves, the production is low. Artificial Intelligence (AI) will be playing a greater role in aerial platforms and air operations. AI's role for greater in-flight autonomy needs understanding.

We also have an analysis on conceptualising cloud counter-air deception and disorientation. Understanding the importance, and considerations of air power for a small state has been highlighted by a Swedish Air Force officer and scholar. Lastly, we look at a futuristic perspective of having an Indian military air base in Africa.

Happy Reading.

Jai Hind!

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