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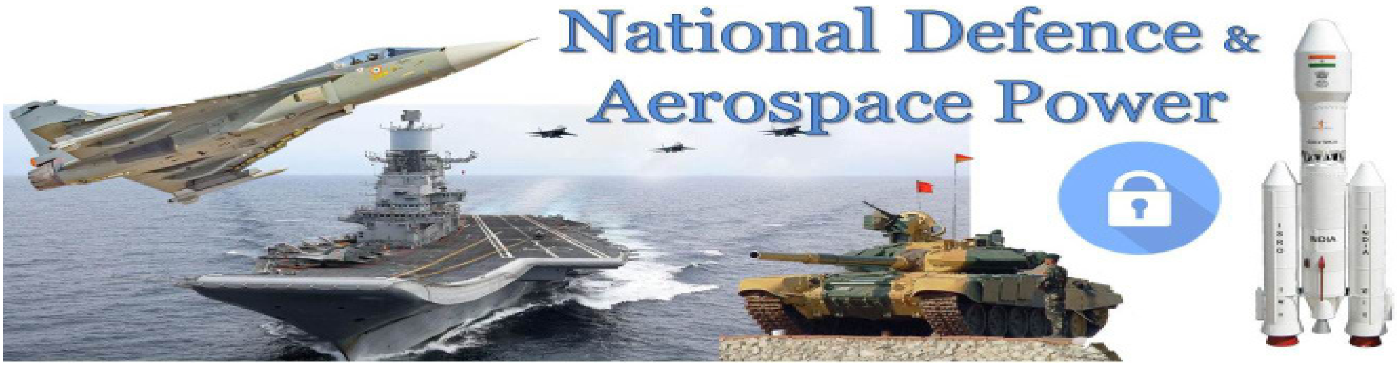

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CONFLICT, CYBER-ATTACK, AND CRITICAL INFORMATION INFRASTRUCTURE: TRACING TRENDS AND THE LESSONS FOR INDIA

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The world is witnessing the increasing application of hybrid warfare, be it in the case of the Russia-Ukraine or Israel-Hamas conflict. Although Hybrid warfare occurs in all domains, one domain that has attracted less attention in its application is—cyberspace. In cyberspace, particularly Critical Information Infrastructure (CII), has been the most vulnerable to destructive and disruptive attacks. The objective of attacking CII is to disrupt, disable, disturb, harm, and cripple systems that play an essential role in the state's everyday work. Today, CII forms the foundations of a state's functioning and plays a fundamental role in its economic growth and security. It broadly includes infrastructure systems related to water, transportation, healthcare, energy grids, dams, and financial and communications sectors. States attack these civilian infrastructures as a tactic to develop psychological distress among the population to create direct and indirect pressure on their government and, at the same time, break the infrastructure backbone that runs a country. Following the recent conflicts in cyberspace, three trends have affected CII, providing lessons that India can learn.

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Hybrid Warfare and its Application on CII: Trends to Acknowledge

The first trend is the attack on CII by the state actors during the conflict. In Ukraine's case, the Russian military has specifically targeted[1] more civilian critical infrastructure, even in some phases coordinating[2] between kinetic[3] and cyber means. Similarly, a simultaneous cyber-attack was carried out in coordination with missile attacks at the start of the recent 'Operation Al-Aqsa flood' by Hamas. Israel was targeted with cyber-attacks on its CII—government websites, electricity power grid, and emerging warning systems.[4] These attacks disrupted and disabled access for civilians. Attacks on the Israeli government's official websites constituted almost approx. 36 per cent of all claimed attacks.[5] Other attacks include the Jerusalem Post website, which was shut down for two days, the Noga Independent Electric system,[6] and the Israeli President's Telegram channel,[7] both of which were briefly unavailable. Many of these are an attempt by state actors to curtail the dissemination of important information, spread misinformation, and, at times, engage in cyber espionage. The exfiltration of Israeli soldiers' information on social media was one such attempt. The attacks on CII vary throughout the lifetime of conflict, shaped by the respective strategies of states. In the case of Ukraine, the attacks can be separated into five phases starting before the onset of war, as stated in a report by Google Threat Analysis Group.[8] These attacks started with the cyber-attack on the Viasat satellite that disturbed the communication access of thousands of people in Ukraine and across Europe.[9] The objectives of attacking CII are twofold: threatening a country's national security and weaponising public opinion against dispensation. There is likely a coordinated attempt between Kinetic and Cyber operations in conflict, as seen recently during Operation Al-Aqsa Flood.

The second common trend observed is hacktivism—hackers who engage in targeted cyber operations driven by different motivations.[10] They form a more extensive ecosystem in hybrid warfare operations. Attacks from hacktivists can inflict serious short-term cyber damage on CII. The Israel-Hamas war is a recent example.[11] However, this was also observed in the Ukraine-Russia war.[12] In the Israel-Hamas conflict, non-state actors from the region, but also beyond, have participated in conducting targeted Distributed Denial-of-Service (DDoS) attacks on Israel's CII. Industrial Control System (ICS) and Supervisory Control and Data Acquisition (SCADA) systems, which are responsible for proper management and efficient working of industries, were targeted.[13] In addition, Real Time Streaming Protocol (RTSP) Cameras were hacked for 'surveillance, reconnaissance, or gathering sensitive information' for which the Israeli government advised people to secure their home cameras, as they may be hacked to disclose information about the military movement.[14] These hacktivist groups include Killnet, Blackfield, Anonymous Sudan from Russia, Imperial Kitten, Muddy Water, Agonising Serpens from Iran, and other independent hacktivists like AnonGhost. For example, Killnet attacked and took down some Red Alert Apps, which warn citizens about incoming rocket strikes.[15] These hacktivist activities may not have destructive consequences in the short term. However, if they continue unabated in the long term, it may have severe implications for states' CII, as Israel Cyber head Gaby Portnoy expressed.[16]

The third factor is the support from the third-party states[17] and the participation of big-tech[18] companies— Meta, Google, Microsoft, Amazon, and Starlink. Technology companies have played a critical role in capacity building and strengthening defensive cyber strategy, supporting the state in defending cyber-attacks on CII. Ukraine has countered attacks from Russian and Russian-aligned hackers by working with private sector companies like Microsoft, Google, and Apple and Western countries like the UK, the US, and other EU members. However, this is also a double-edged sword, which gives these tech companies access to their CII, giving them great power in their hands. For example, it was reported that Elon Musk scuttled an attack on a Russian ship by refusing to give communication access through a stark link satellite.[19] This shows the power of private actors and big tech interfering and controlling cyberspace.

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Lessons for India

India is particularly vulnerable to cyber-attacks on its CII, which currently includes seven sectors: government services, healthcare, banking, transport, telecom, power and energy, strategic and public enterprises, and financial services and insurance—from China and Pakistan. In 2018, the Ministry of Electronics and Information Technology reported that most attacks on India came from China, amounting to 35 per cent. China, which has superior and sophisticated capabilities, stands at the top of the list. These cyber-attacks on India's CII have severely compromised its national security. India's critical infrastructures increasingly depend on cyber tools for proper functioning and operations across the public and private sectors, making them more prone to cyberattacks. In 2023, India featured sixth in the Asia-Pacific region on cyberattacks.[20] The Chinese cyberattacks have targeted multiple sectors—banking and finance, power grids, transmission infrastructure, and healthcare.[21] These attacks can potentially disrupt India's CII, harming its security and economic growth. Such attacks have particularly increased after the 2020 Galwan conflict, mimicking the deteriorating relations between the two countries and representing Beijing's changing perception towards New Delhi. For example, China attacked seven State Load Dispatch Centres and four Regional Load Dispatch Centres that control grid and electricity dispatch.[22] These attacks work as a probing exercise to identify potential loopholes and weaknesses in India's CII for future exploitations. With increasing risk, India has expanded its CII ambit

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to include new domains like—Paytm, National Crime Records Bureau, and All India Institute of Medical Sciences.[23]

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To strengthen its CII, India must build its defensive and offensive cyber military capabilities and establish a robust and dynamic critical infrastructure security framework. At the same time, India needs to make its established protocols more transparent and accessible by working with the private and public sectors. In this endeavour, the private sector should be given more responsibility in shouldering cyber security initiatives, as we have seen in the US cyber security strategy released this year.[24] Attacks on CII are much more complex and are undertaken mainly by state or state-supported hackers and sometimes by non-state actors. However, with the role of non-state actors increasing, India must consider their role while strategising and focusing on increasing its cyber workforce. Another effort is strengthening global cyber partnerships with big tech and states like the US, UK, EU, Japan, and Australia on capacity building, information sharing, law enforcement, and prosecution. Support from cyber friends can play an essential role in deterring hybrid warfare from adversaries like China, particularly in the cyber domain. The safety of CII must be a national security priority, and the focus should be on developing their cyber resiliency and building capabilities to protect them. The important lesson is that preparedness done in peacetime will help India during conflict and war, and to implement this, India should follow the mantra of better cyber defence going forward.

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