EMERGING NETWORK CENTRIC WARFARE CAPABILITIES OF INDIAN MILITARY: CHALLENGES FOR PAKISTAN'S SECURITY

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Abstract

The changing strategic dynamics of South Asia have posed serious challenges for Pakistan. The Indian military doctrinal development suggests that it is aiming for limited, swift, and intense warfare. To operationalize such operations, the Indian military is focusing on the Network Centric Warfare (NCW) capabilities. These capabilities would enhance the Indian military intelligence gathering, improve communication, and provide real-time situational awareness to commanders for timely decision-making during any contingency. This paper, therefore, highlights that the Indian military NCW capabilities entail serious consequences for the strategic stability of South Asia especially Pakistan. The NCW skills would improve the capabilities of Indian armed forces and achieve greater shared battlespace awareness through self-synchronization against Pakistan. It would create conventional disparity and push the region towards an unending costly arms race in the NCW domain.

Keywords: Network Centric Warfare, Strategic Stability, Nuclear Deterrence, Arms Race, Security.

Introduction

India is engaged in a continuous process to revamp its overall military capabilities to create regional dominance in the region. The strategic partnership between Pakistan and China has forced the Indian policymakers to modernize their military to meet the emerging challenges. When it comes to China, the Indian strategic thinking adopts defensive realism approach and try to balance the Chinese military prowess. But against Pakistan, it espouses an offensive realism approach to maximize its military might and outclass Pakistan in all domains. With this background, this article highlights India's massive investment in the Net-centric domain and its likely implications for the security of Pakistan.[1]

Modern warfare depends on information superiority, in other words, it is based on the Network Centric Warfare (NCW) capabilities of a country. This is the reason that countries with greater real-time information always outclass their enemies in modern warfare.[2] The NCW is an emerging concept; many advanced countries have already begun working on these lines to integrate their forces accordingly.

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The term NCW mainly focuses on the amalgamation of strategies, innovative tactics, modern techniques, advanced procedures, and greater synergy and integration among tri-services.[3] A country with fully networked military and technologies always gets an advantage in this modern age. The application of NCW deeply impacts human and organizational behavior. It deals with the performance of military forces; how do they act, perform, or unite themselves when they are schmoosed. According to one such assessment, "interaction with the networked soldiers, sailors, airmen and marines executing operations at the tactical or operational level of war gets a substantial advantage over enemies because of the shared situational awareness."[4] Therefore, it could be assumed that "the NCW capabilities are applied at all three levels of warfare (strategic, operational and tactical) and across the full-range of military operations to stability and peacekeeping operations."[5]

The NCW capabilities help the military to increase its tempo and quick responsiveness to any military contingency. It decreases the risks/costs and enhances combat effectiveness of military and increase its chances of victory. To understand the effectiveness of NCW capabilities for the Indian military, it is pertinent to understand some key concepts in this domain. The Indian military is a huge force spread over the whole Indian landmass from the Himalayan mountains to the Rajasthan desert. To maintain vigilance, counter threats and remain dominant in case of any rivalry, it is important for the Indian military to maintain information edge against enemies in the region and beyond.[6] Following is the figure illustrating NCW governing principles:

Figure-1: Governing Principles of NCW

The Indian military is working to overcome its deficiencies in the NCW domain to connect and share situational awareness with its geographically dispersed forces. The idea of NCW is to bring onboard isolated forces spread over huge landmass so that they can effectively communicate and share the battlefield situation.[7] Timely information about the adversary's character, placement, and mobility would help the Indian forces to plan and execute their operations accordingly. In this way, the best use of NCW capabilities would not only connect the remotely deployed forces but also it would help to produce good results in the shape of information edge on the battlefield.

After the 2001-02 standoff between Indian and Pakistan, the Indian army with the Cold Start Doctrine (CSD) stressed the rapid military operations within 72-96 hours at multiple locations.[8] A military doctrine cannot work effectively without the support of adequate technology, offensive weapons, their assimilation in the armed forces, synergy and coordination along with NCW and EW capabilities. In its attempt to assimilate the NCW in the Indian military, the first serious attempt was made during Vajra Shakti military exercise in 2005. The Indian army introduced the Force Multiplications Command Post (FMCP) to integrate the flow of information from aircraft, AWACS, ground forces, and radars to the field commander to have a better and clear picture of the battlefield. Though it is difficult to assimilate NCW capabilities in the military, the Indian military realized that without a network centricity it would not be possible for them to effectively execute their military doctrines against their enemies.[9]

All previous warfighting doctrines of India had a few similarities; first, they emphasized on limited nature of warfare; second, the Indian military envisaged force modernization and NCW capabilities; third, synergy and integration; fourth, quick mobilization and shallower thrusts; fifth, greater emphasis on the timely information, observation, and effective reconnaissance abilities.[10] The Indian military realized in their several doctrinal reviews that to successfully execute their strategies they would require comprehensive NCW capabilities to maintain information edge during any short or prolonged military conflict in the future. At the moment, the Indian military may not be enjoying overwhelming conventional asymmetries but in future if this trend of modernization is continued then security situation in South Asia may get worse and provide Indian military an opportunity to carry out limited rapid military operations to establish its strategic dominance in the region.

Indian Military NCW Capabilities

India is striving to plug the gaps and overcome its operational weaknesses in its overall military machines. The Indian military is planning a lean, mobile and technologically oriented force in the future.[11] Since 2003, the Indian military strategy has changed from total wars to shallow maneuvers, limited war, hot pursuit or surgical strikes, etc. The Indian leaders have also repeatedly stressed that the future wars would be short and intense.[12] To successfully execute such operations, the Indian military is aspirant to acquire NCW capabilities, which would enable them with an information advantage and help them to execute their quick and swift operations.

Spy Satellites: Real-time Information

In the NCW sphere, spy satellites play a key role in obtaining real-time information about the enemy. The Indian military has invested heavily in this domain.[13] India considers space as an important part of its quest for NCW capabilities.[14] It has carried out close cooperation with countries, like Israel, to improve its overall space program for military usage. According to former Director General of Defence Research and Development Organization (DRDO), V. K. Saraswat, "the Indian military is planning to acquire designated (spy) satellites for its tri-services."[15] The Indian Space Research Organization (ISRO), since 2009, has achieved strides in the field of spy satellites. India joined the space club in the 1960s. Initially, it focused on civilian use but later, enhanced its capacity and launched many spy satellites to support its military overall command and control structure and to acquire seamless real-time information.[16]

- **RISAAT-II Spy Satellite (2009):** The Indian military took a drastic step after the Mumbai attacks in 2008 and launched the RISAT-II Spy satellite in 2009 in close collaboration with their strategic ally-Israel. The RISAT-II comes in the category of spy satellites. It can scan deep inside the territory of an adversary, check for the movement or deployment of troops in all weather conditions.[17]
- **GSAT-7 Rukmini-Maritime Domain Awareness (2013):** India considers itself as a net security provider in the region and wants to dominate IORs[18] because of the increasing presence of the Chinese navy and its close economic and strategic partnership with Pakistan in the region. However, to maintain vigil over its huge maritime boundaries, the ISRO launched its maritime specific GSAT-7- (Rukmini) satellite in 2013. It has enabled the Indian navy to share situational awareness with its warships, submarines, maritime surveillance aircraft, Indian Air Force (IAF) and their land-based platforms and command and control systems to effectively coordinate their operations in the Bay of Bengal, the Arabian Sea and the Indian Ocean region.[19] According to an expert, The GSAT-7 helps Indian maritime forces to scan a vast area of about 3,500-4,000km in the IOR and beyond."[20]
- **EMISAT-Information Edge in the Land Warfare Operations:** The ISRO launched EMISAT in 2019 to plug in information gaps in its land warfare strategy. Since then the Indian army is utilizing the EMISAT for its information gathering in South Asia.[21] This spy satellite is considered to be the most important strategic asset for the Indian army when it comes to their communication with their soldiers operating in diverse and difficult terrain. These isolated forces would be able to get real-time information about the target, and situational awareness about the battlefield. The induction of EMISAT would free the Indian soldiers operating in mountainous, rugged terrain from carrying huge communication equipment and gadgets.
- **GSAT-7A Spy Satellite-Aerial Reconnaissance:** The ISRO launched the GSAT-7A satellite to provide the Indian military with secure, quick and

clear communication capability.[22] The GSAT-7A satellite is a designated satellite for the IAF and it will be operated by them. The induction of GSAT-7A would augment IAF global outreach and NCW capabilities for optimum utilization of resources during a conflict. It would connect the aerial assets with the ground station for early warning, and accurate round the clock information to enhance IAF's precision and strike capabilities. It would also enhance the range and outreach of current and future armed UAVs in IAF arsenal to take out adversary's defenses from elongated distances.[23] The ISRO is also planning another satellite GSAT-7C for the IAF to improve its NCW capabilities in the changing strategic environment.

Airborne Early Warning Systems/Aircraft

- **Phalcon AWACS-Aerial Surveillance and Reconnaissance Aircraft:** In 2004, the Indian government inked a deal with Russia and Israel to acquire three advanced AWACS to beef up their surveillance and reconnaissance capabilities.[24] The Phalcon AWACS has a maximum speed of 972 Km per hours with high precision and capability to identify moving targets. The Phalcon system can track over a hundred incoming targets and it can intercept at least half of them. Moreover, it covers all maneuvering objects from ground to 40,000ft in the air. The Phalcon AWACS operates at 30,000ft and covers the range of 500km deep inside enemy territory.[25]
- **Airborne Early Warning and Control System-Indigenous Reconnaissance Aircraft:** The IAF has developed its first-ever locally manufactured airborne early warning and control system (AeW&CS) in 2017. This aircraft can track incoming missiles, aircrafts and UAVs. It is equipped with 240-degree coverage Radar and would identify the incoming threats and relay that information to command centers and also to fighter jets in the air for a quick response. The AeW&CS has a potent range of about 200km with an effective surveillance ability. [26] The procurement of AeW&CS enhances Indian overall surveillance and reconnaissance capabilities and gives IAF greater flexibility, outreach and space for prompt countermeasures against incoming threats.
- **P8-I Aircraft-Maritime Domain Awareness:** To keep a constant check on huge maritime boundaries, surface, and subsurface warships, the Indian navy has inducted highly advanced maritime surveillance and reconnaissance aircraft P8-I. In addition to Rukmini Spy Satellite, this aircraft with its superior NCW capabilities is a force multiplier. India bought eight P8-I aircraft from the US under a $2 billion contract[27] to boost its Maritime Domain Awareness (MDA) and get the information edge. This aircraft possesses about 1,200 nautical miles range in the IORs, which helps the Indian navy to maintain its maritime dominance.[28] The induction of this maritime surveillance aircraft would boost India's maritime domain awareness.

Highly Advanced UAVs: Surveillance and Targeting

- **Israeli Heron TP and Heron-1 UAVs:** The Indian military started the acquisition of armed UAVs from Israel in the post-1999 situation. Since then Israel has been supplying the advanced drones to India for reconnaissance and surveillance purposes. The efficacy of UAVs in modern warfare cannot be ignored. They could be used for up-to-date information gathering, close air support, targeting the enemy positions, C4I vehicles in the battlefield, strategic assets, command and control centres, etc. It is reported that India and Israel are contemplating "project cheetah" to equip its all UAVs with missiles. [29] The IAF operates about 180 Israeli manufactured drones, which includes 108 Searchers and 68 unarmed Heron-1 for surveillance and reconnaissance purposes at high altitude. The Indian military in 2015 inked a deal worth $400 million with Israel for the acquisition of highly sophisticated ten Heron TP armed UAVs. It possesses 40-hour of long endurance time and it can carry a 1000kg warhead.[30] The Heron TP is a multipurpose UAV with greater outreach, lethal firepower, and long endurance. It gives the Indian military a wide range of options. It could be used for intelligence gathering deep inside enemy territory and provide close air support to the advancing troops. It could also be used against hardened targets, such as, bunkers, enemy fortifications, strategic sites, etc.
- **Induction of Harop Missile-Suicidal Drone:** Israel developed a suicidal drone that can operate in an area of more than 1,000km. The Harop missile can fly over the intended object for more than six hours and then self-destruct into the target.[31] The Harop UAV carries a warhead of about 15kg,[32] which makes it extremely destructive for the radar sites, command and control vehicles in the battlefield, missile sites and strategic installations. The Harop UAV is remotely controlled by the field commander, who may select a target and take it out with greater precision.[33] India has ordered ten Harop-UAVs under a deal worth $ 100 million. These drones would revamp the Indian military's network-centric, electronic warfare, surveillance, and reconnaissance capabilities.

Surveillance Radars and Reconnaissance Systems: Operational and Future Plans

- **Long Range Reconnaissance and Observation System- 2003:** The Indian military after the failure in Operation Parakram in 2001-02 learned a lesson that long drawn conventional war is not possible in the existing strategic environment. Later the idea of CSD emerged, which focused on synergy, integration, speed, and mobility of the Indian armed forces. To acquire these capabilities, the Indian army needed a wide range of weapons and equipment. In that context, the Indian military signed a deal with Israel and inducted LORROS.[34] This particular system provides round the clock vigilance at a potent distance of about 5-10 km. Such a system in

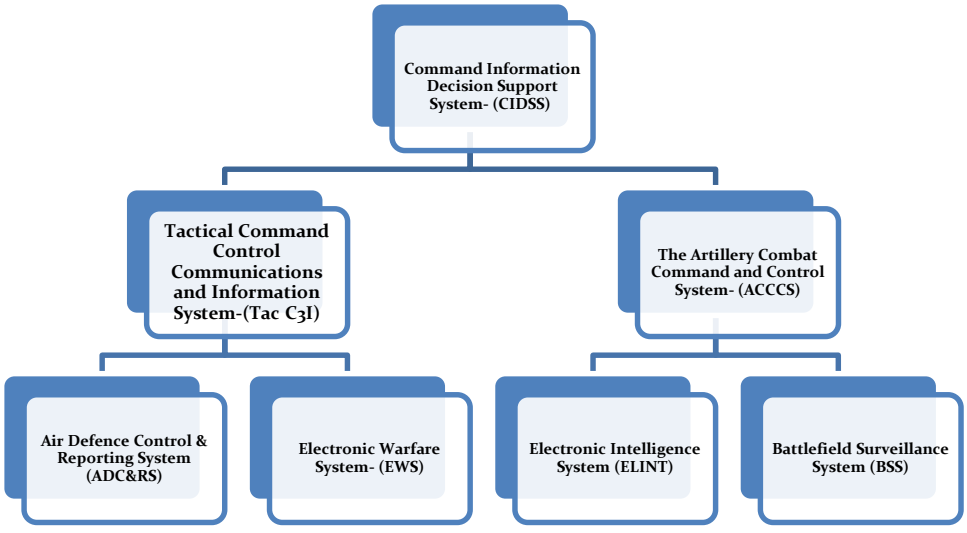
place would give the Indian army an edge on the battlefield. They will get to know about the deployment, movement, and size of enemy forces during a war. The LORROS is a remotely controlled system that provides 24/7 visibility against any incursion or movement by the enemy forces. It helps the Indian forces positioned at the border to spot, identify, and neutralize any movement and attack by providing an advantage of time and distance for the optimum results.

- **Force Multiplication Command Post-Integration and Synergy:** The Indian army in 2005 introduced Force Multiplication Command Post (FMCP) in the Vajra Shakti exercise to integrate the flow of information to improve operational competence and proficiency.[35] The FMCP helped the Indian military to practice the NCW and EW warfare capabilities in a war-like situation. Such capabilities are essential in modern warfare. It helps the field commander with real-time information, battlefield visibility, enemy's disposition, connectivity of all arms and uninterrupted contact with the high command for instructions and updates.
- **Swathi Weapon Locating Radars-Threat to Artillery Forces:** The induction of Swathi Weapon Locating Radars (SWLRs) can detect the exact position of artillery fire, mortar and rocket sites, which provides Indian army with an option to strike back with greater precision and accuracy. According to the reports, the Indian army has installed almost 30 SWLRs on the border, which, according to the Indian COAS, "is being used extensively along the LoC." Mr. Parrikar, former Defense Minister of India, said that, "Swathi could be a great equipment to ensure adversaries do not use artillery fire."[36] The SWLR can store up to 99 weapon locations of the enemy and swiftly relay that information to the command for timely countermeasures.[37]

Tactical Communication System

The Indian army has also developed the Tactical Communication System (TCS) to improve its coordination, situational awareness, and integration. The connectivity among forces is the backbone of every military around the globe because the nature of warfare has become information-based and totally relying on the digitized battlefield communications network. The TCS was initially coined in 2000 but due to some governmental and bureaucratic hurdles, it faced many delays until 2014. This project was under the "made in India' slogan by the Indian government and this is the reason that local defense companies including BEL Larsen and Toubro, Tata Power SED, and HCL Ltd were tasked to come up with a prototype of TCS.

Figure-2: Command Information Decision Support System



(**Source**: https://www.indiastrategic.in/topstories3648_Indian_Army_Modernisation_and_Current_Status.htm)

The total cost of the TCS project is close to $2 billion.[38] The TCS plays a vital role in military communication and it is employed within or direct support of tactical forces deployed on the battlefield. It is designed to incorporate changing strategic and tactical dynamics and offers safe and secure communication within the army. It takes less installation time in case of repositioning of tactical forces from one front to another.[39] The induction of TCS in army boosts NCW capabilities, enable situational awareness, enhance synergy and integration and improve command and control system. The primary function of the TAC C3I system is to provide commanders with precise, appropriate, and reliable information. It would enable the Indian army to convey command decisions to their troops during hostilities and peacetime.

IAF's Integrated Air Command and Control Systems

The modern warfare is heavily dependent on information edge available to decisionmakers or commanders on the field. The decisionmaker's failure to acquire precise situational awareness of the battlefield would lead to disastrous consequences. To overcome these strategic underpinnings, the IAF came up with the Integrated Air Command and Control Systems (IACCS) to improve interaction, integration, command and control in its aerial operations. The establishment of IACCS is a significant step towards the concept of joint operations with greater connectivity and intensity. The IAF is largely dependent on fiber optics-based network called Air Force Network (AFNET), on which the IACCS operate and synchronize all land-based radars and air sensors, weapon systems, airbases and other air force installations and command centres.

The IACCS is an indigenous project developed by the Indian defense companies at the cost of about $ 1.3 billion.[40] The IAF has installed 5 nodes of this system at Barnala (Indian Punjab), Wadsar (Indian Gujarat), Aya Nagar (New Delhi),

Jodhpur (Rajasthan) and Ambala. The IACCS has been linked with vital Air Defense installations of the IAF, which has provided the Network Centric ability to the Indian air defence units. The main objectives of IACCS are to collect real-time information from all assets on the ground and in the air including AWACS, UAVs, aircraft, satellites, etc. It provides Indian military's command with a better picture of the situation on the ground for timely countermeasures. In this way, the IAF will ensure 24/7 vigil over its air corridor and it would quickly detect any aerial movement by any enemy aircraft, helicopters, UAVs and AWACS.[41] The induction of IACCS in the IAF would improve communication network, accurate information acquisition and round the clock air space vigilance which may allow the Indian military with timely countermeasures against any intrusion. However, after the Pulwama incident in response to the Indian botched surgical strikes, the Pakistan Airforce (PAF) did cross the LoC and dropped some bombs near their key strategic installations.

Artillery Command, Control and Communication System

The Indian defense firm BEL in collaboration with DRDO developed indigenous Artillery Command, Control and Communication System (ACCCS) for the Indian army. The ACCCS would improve the Indian army's precision to take out the targets on the LoC or international border. The ACCCS is also known as 'Shakti' in the Indian army. It is going to enhance the effectiveness of Indian artillery with improved tactical computer, handheld control system, gun display unit, all of which are synchronized through tactical radio networks, landlines, or fiber optic cables to boost the performance of artillery fire against the enemy.

According to reports, the major functions of ACCCS are "technical fire control (trajectory computation), tactical fire control (processing of fire requests and ammunition management), deployment management (suggesting deployment areas for guns and observation posts for defensive and offensive operations), operational logistics (timely provisioning of ammunition and logistic support) and fire planning (generation of fire plans, task tables and automatic generation of gun programs)."[42] Currently, the Indian artillery system is being operated manually but after the installation of the Shakti system, the Indian army will make use of software with GIS and GPS functionalities to assimilate and systematize all artillery operations.

Challenges for Pakistan's Security

The above-mentioned developments will create a conventional imbalance in South Asia and compel Pakistan for countermeasures. Though, currently, some C4I systems are in place and Pakistan's indigenous defense industry tries to cope up with the challenges but in future, it would require the induction of spy satellites, highly sophisticated AWACS for air, ground and maritime surveillance and reconnaissance. India's acquisition of NCW capabilities would seriously erode the conventional parity and push Pakistan to follow suit and indulge in arms race. Pakistan may invest in quality, lethality and optimum utilization of available resources with smart acquisitions and tactically sound strategies.

The Indian military's whole war-fighting strategy is focused on Pakistan. Since 2001-02, India has been trying to find a gap in Pakistan military's nuclear and conventional capabilities to execute CSD or carry out punitive strikes. India's doctrinal maneuvering has been fluctuating since 2004 because of the lack of adequate offensive firepower and required NCW capabilities. Since 2004, the Indian military has inducted many weapon systems in its arsenal and it is in the process of improving its NCW and EW capabilities to maintain information superiority. The Indian military's new land warfare doctrine of 2018 has mentioned that India would carry out "punitive strikes" to counter any alleged terrorist act.[43] It could be assumed that India's offensive doctrines, modernization and capabilities are seeking to resort to limited strikes, which may take the conflict to next level.

There is no doubt if India tries to cross the border again or conduct any counterfeit surgical strike, there will be a strong response from Pakistan.[44] It has been demonstrated recently by the PAF. In the future, if India again resorts to any misadventure and the casualties on the Pakistan side increases, there will be quid pro quo plus response, which may seriously hurt the Indian side. Supposedly, if India faces huge casualties in case of Pakistan's response, then because of the public pressure and prestige, it may escalate the conflict and carry out more strikes against Pakistan. Pakistan's military will not stay idle, they would also respond accordingly and both sides may escalate the conflict.

Conclusion

Recent strategic trends in South Asia suggests that this region would remain volatile for next few years because of the unresolved issues, proxy wars, aggressive military doctrines backed by NCW capabilities and force modernization at rapid pace. The Indian military strategies and doctrines are offensive in nature and India's assimilation of NCW capabilities, modern sensors and weapon systems may have adverse implications for the region. Pakistan cannot afford to remain idle to the changing strategic dynamics in the neighborhood. Therefore, Pakistan must consider four areas to meet the challenges posed by the Indian military's NCW capabilities. First, it must improve digitized communication links within armed forces to enhance their integration and synergy on the battlefield. Secondly, Pakistan must boost its situational awareness through incorporation of NCW capabilities. It would help a commander to take right decisions at the right time. Thirdly, Pakistan needs to improve its C4I system. It must be robust, quick and secured from any decapitation strike. Lastly, it is the human factor that plays an important role. It is always men behind the guns, who play their role. It is pertinent for the Pakistan military to assimilate NCW capabilities in its all corps, cadres and ranks from top to bottom so that they can get familiar with revolution in military affairs. The digital weaponary is the future of warfare; it is, therefore, necessary for Pakistan to master this trick to overcome challenges to its security.

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