
Securing of Critical Infrastructure: Lessons Learned for the Indian Armed Forces from the Russia-Ukraine War

Ajinkya Jadhav

Abstract

This commentary analyses the military operations executed by the Russian Army in Ukraine to secure Zaporizhzhia Nuclear Power Plant and Azovstal Steel Plant without major damages so that these assets can be put to use subsequently. The commentary brings out the vital operational parameters required to secure such critical assets. It brings out vital lessons for the Indian Armed Forces to build capacities and to plan and prepare for such missions. It also recommends changes in doctrinal approach and training philosophy in a war scenario. Contingency planning to avoid any nuclear disaster or accident is vital for the success of such missions. The capture of ZNPP and Azovstal by the Russian Armed Forces has added a new dimension to warfare. India needs to plan and prepare for such military operations in future.

Col **Ajinkya Jadhav** is a Former Senior Fellow, CLAWS.

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Introduction

Kamandaki, a renowned statesman of ancient India wrote in ‘Nitisara or The elements of polity’ that ‘Territory, allies and wealth’ should be gained from war.¹ A just war should be economical and should result in acquiring resources that will enhance the state’s economy. The military aim derived would be to capture territory

by destroying the enemy’s military and the associated war-waging potential. At the operational and tactical level, the formations and units would be tasked to employ all means of modern military technology to destroy the combat forces and capture territory. The military besides destruction and capture of territory has an imp role in securing critical infrastructure in enemy territory which can enhance the economy of the country. The wars of the 21st century are fought under the cloud of the grey zone, the battle lines are blurred even at the tactical level and the influx of disruptive technologies has further made the battle zone more complex.

The Russian campaign against Ukrainian civilian infrastructure would have thousands of potential military targets to choose from power stations, energy supply networks, water resources, internet, rail, and transport hubs. Any attacks that succeeded in disrupting the supply of food or medicines could have a devastating impact on the economy of Ukraine,² especially if timed to coincide with the coldest periods of the coming winter season. Destruction or blockade was however not the only military aim of the Russians, securing critical infrastructure such as the operations to secure Europe’s largest nuclear plant in Zaporizhzhia, Azovstal Steel plant or the Chornobyl nuclear assets is a unique military operation that has lessons for the Indian Armed Forces to learn. This commentary will focus on the need to build capacities and capabilities

for the Indian Army to ensure the security of critical infrastructure in enemy territory in a war scenario to further the national aim of building the economy. Although there are a large number of critical assets such as dams, power plants, cyber hubs, atomic energy plants, airports, ports, petroleum resources, nuclear plants, and strategic bridges, which need to be secured intact, however, this commentary will focus only on the lessons learnt from the Russo-Ukraine war.

Russo-Ukraine war- Zaporizhzhia Case Study

Zaporizhzhia, is an important town in Ukraine's southeast that houses the largest nuclear power plant in Europe. Ukraine has four nuclear power stations comprising 15 reactors. The Zaporizhzhia nuclear power plant (ZNPP) has six reactors, which can together produce about 5,700 MW of electricity. Nuclear energy caters to about half of Ukraine's power demand. Russian forces attacked the plant on the night of March 3, 2022, early in the invasion, and took control of it relatively easily.³ The Kremlin's actions around the Zaporizhzhia nuclear power plant represent a new dimension in warfare. While sporadic fighting continued over the following months, the situation escalated dangerously in August 2022 with increased shelling, which the Russians and Ukrainians blamed on each other leading to concerns of a major nuclear disaster. Buildings inside the nuclear complex were hit, though no significant damage was reported. Radiation levels around the site were reported to be stable, meaning there has been no leakage.⁴ However, the situation remains extremely volatile. This is the first time that a nuclear installation has been caught in a military conflict, that too one that is in operation. It is very important to analyse the criticality of securing the nuclear plant and the military expertise to execute such a task. Nuclear power plants are built for peacetime operations, not wars. However, the amount of energy these nuclear plants can generate is a huge economic resource for any country which plans to seize it in the eventuality of war.

Technical Parameters to Ensure Safety. In order to plan a complicated military operation to secure a strategic asset in a foreign land, the military must consider certain technical parameters for the safety of the plant.⁵ The first being the criticality of maintaining the physical integrity of the facilities consisting of reactors, fuel ponds or radioactive waste stores. The second being no sudden disruption in the safety, security and regulating systems of the reactors. Third, the operating staff must be secure and be able to fulfil their safety and security duties and have the capacity to make decisions free of undue pressure. The fourth point is there must be a secure off-site power supply from the grid for all nuclear sites. The fifth issue being there must be uninterrupted logistical supply chains and transportation to and from the sites. Sixth, there must be effective and functional on-site and off-site radiation monitoring systems and emergency preparedness and response measures; and lastly, there must be reliable communications with the regulator and key technical manpower.

Role of Russian Military. Russian military in a swift and bold operation secured the critical asset of ZNPP on March 3, 2022. It is assessed that the key elements involved were the Spetsnaz and Rosgvardiya.⁶ Spetsnaz are the special forces of the Russian military they have close linkages with GRU which is the Russian Intelligence service. Spetsnaz (FSB) Federal Security Service a specialised organisation has a unit named 'Vympel' which consists of four sub-units and is tasked and trained for securing strategic targets, such as nuclear plants, atomic power plants, etc.⁷ The 'Rosgvardiya' are the National Guards of the Russian Federation and are mandated to guard important military facilities and are assessed to secure the perimeter of the assets. The exact composition of the force level to execute such an operation is unknown but the technical expertise to secure the nuclear assets to ensure the safety parameters mentioned above was ensured by the military. It brings us to the fact that the task force deputed to secure the nuclear plant had

technical experience as well as the skill to secure such a critical installation without causing a nuclear accident.

The Risk Factor. Securing a nuclear asset in the middle of a conventional war is a unique achievement by the Russian military. This feat comes with a huge amount of risk. This is the first time in the history of warfare that a functional nuclear installation has been caught in a military conflict. By end of August 2022, the last remaining external power supply line to the complex was disrupted due to the shelling and small-arms gunfire and the station had to fall back on emergency generators. Nuclear plants are heavily dependent on external electricity for a variety of needs, including the operation of water pumping systems to keep the reactors cool. The line was restored, but for a few hours, it brought the world to the brink of a major nuclear disaster. The prolonged conflict in the region thus increases the possibility of a nuclear disaster.⁸ Modern nuclear reactors are built to withstand considerable shock and impact. They have several layers of reinforced steel and concrete, and also elaborate fire security systems. Most of these reactors can survive earthquakes of magnitude eight or higher. They are also designed to shut down automatically when they sense major natural hazards. Automatic machine gunfire or even artillery shelling is unlikely to cause harm or result in a nuclear accident. However, it is difficult to predict the impact of ICBMs or rocket attacks on the reactors.⁹ There is a human element in running a nuclear power plant, the operators are the first and last layers of defence for the facility and the population. They are the first responders to prevent the nuclear accident. Hence, it is pertinent that the staff of the reactor be secured first and protected at all costs to ensure the reactor remains functional.

The possibility of an appreciated major nuclear accident in a war scenario cannot be ruled out. Buildings and water pools used for storing used and unused nuclear fuel rods may not be as strong as the reactor itself, and can suffer significant damage in a rocket or even artillery attack.

The worst thing that could happen is if a site is deliberately or accidentally shelled and the containment building which houses the nuclear reactor is hit. These containment buildings are not designed or built for deliberate shelling. They are built to withstand a minor internal explosion of, say, a pressurised water pipe. But they are not designed to withstand a huge explosion. Zaporizhzhia nuclear reactor is already facing a live threat.¹⁰ Cooling systems powered by external electricity are extremely crucial to the safe operations of nuclear reactors, which have to handle temperatures in the range of thousands of degrees Celsius. A non-functional cooling system can lead to the reactor melting, or exploding, under tremendous heat, resulting in an uncontrolled release of nuclear radiation. There are other threats as well. Rogue elements could try to utilise the war situation to steal nuclear material from the site. The proliferation of Private military companies and their growing role in the ongoing Russo-Ukraine war increases this risk factor. Closer to Indian borders this risk is very real and poses a big challenge in the Indian subcontinent. Ukraine is a signatory to the Nuclear Non-Proliferation Treaty as a non-nuclear weapons state. Each of its nuclear facilities is under IAEA safeguards. That means every bit of nuclear material and fuel, every kilogram of uranium and every gram of plutonium has to be accounted for and reported.

Russia using ZNPP as a Shield and Weapon. As the war progressed post capture of the nuclear plant on March 2022, it shifted from shield to weapon. Russia realised that any issue related to the safety of nuclear power plants will automatically get headlines in the Western media. Russia hopes the threat of nuclear accident will persuade NATO to push for a ceasefire or to end support for Ukraine.¹¹ Hence, the capture of this strategic asset is a critical weapon in the hands of the Russians.

The Capture of Azovstal Steel Plant

Azovstal is one of the largest metal plants in Europe and thus a huge economic source. For decades, it was key to the Soviet Union's railroad

system and shipbuilding efforts. It was privatised in the 1990s after Ukraine's independence. The massive complex of warehouses, railroad tracks and industrial-strength furnaces sits on four square miles along Mariupol's coast, across the river from the city's downtown district. Before the invasion, the plant employed more than 10,000 people, according to company documents. Buried underneath the plant is a network of bunkers and tunnels dating back to the Soviet era. The Ukrainian army did use this facility as a defensive enclave and put-up stiff resistance to the invading Russian forces. For weeks after the Russian forces laid the siege on this vital asset, these subterranean spaces have become shelters for hundreds of civilians, many of them Azovstal employees their family members and a defensive stronghold for the Ukrainian army.¹² Russia claimed the capture of Mariupol was complete after the last bastion of Azosvtal steel plant fell on May 9, 2022.

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Recommendations for Indian Armed Forces

Identification of Critical Assets. In case of a hot war scenario in the Indian context, it is essential that the military in conjunction with the other government agencies identifies critical assets the capture/seizure of which will further the national aim, enhance the national economy, avoid any disaster/accident, provide rich energy resource to the nation. This is a national effort at the strategic level and the same has to be a whole government effort involving multiple agencies to plan such an operation in conjunction with the military. Vital assets such as nuclear power plants, electricity power grids, cyber hubs, internet services, natural gas resources, airfields, ports etc might have to be identified for securing

intact. Accurate and reliable intelligence is critical for the success of such operations.

Capability Development. The vital lessons brought out during the ongoing Russo-Ukraine war reflect the need for building capacities and developing capabilities to plan and execute such tasks. The assessed composition could be a heterogeneous one with the special forces taking the lead supported by technical experts in the field, force level for perimeter security and adequate air, AAD and missile cover to guard against any strike to avoid any disaster.

Doctrine & Training. This is a unique mission for the armed forces. The Russians have proved that such a task is in the realm of execution. The armed forces are traditionally trained to capture by the employment of firepower, force and shock action. Special forces across the world execute special operations by maintaining continuous strategic surveillance and direct action. Doctrinal changes in our operational philosophy will have to be incorporated by combining stealth and precision to first carry out strategic surveillance and then secure these critical assets with minimum or no damage to the asset. The special forces who are capable of operating in covert as well as overt modes are best suited for such tasks. New mission-specific training methods will have to be incorporated towards the accomplishment of such tasks. A lot will depend on the joint training of the heterogeneous task force which is tailor-made for such a mission.

Contingency Planning. The technical parameters as mentioned above and the safety concerns take priority as any accident would lead to a catastrophe, jeopardising the entire national effort. The major concern in the Indian sub-continent is the unconventional threat. The concern of critical assets falling into the hands of terrorists looms large in this typical grey zone environment. Hence, it is absolutely critical for the Indian Armed Forces to guard against such misadventures which can be a major threat to national security. Timely action by the armed forces to secure such assets is vital in the interest of the country. This is

a complex mission and will have to be deliberated upon with details to cater for all the contingencies. As the situation unfolds in Ukraine more contingencies will emerge and the situation will have to be monitored to draw important lessons from the conflict.

Conclusion

The Russo-Ukraine war has brought out a number of lessons for the entire world. The demonstration of securing vital assets in Ukrainian territory by Russia has been a first of its kind of military operation. Indian Armed Forces should draw out vital lessons in addition to this commentary. Leveraging important assets towards enhancing the economy and furtherance of national aims is crucial for national security, especially in a war scenario. Capacities and capabilities need to be developed to achieve these goals. Planning and preparation will have to be carried out at all levels from strategic to tactical level involving all elements of national machinery. Contingencies will have to be thought of and inculcated in the plans. The capture of ZNPP and Azovstal by the Russian Armed Forces have added a new dimension to warfare. India needs to plan and prepare for such military operations in future.

Notes

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