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## RUSSIA'S RESURGENCE IN SPACE: ANTI-SATELLITE CAPABILITIES & TESTS

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Russia has been causing turmoil in the US security circuit following the White House confirmation of Russia testing an Anti-Satellite (ASAT) capability. This capability, which would be nuclear powered, has not been deployed. POTUS has requested a diplomatic engagement with its Russian counterpart to discuss this issue at length.<sup>1</sup> Although there is 'no immediate threat' that has been deciphered from such developments, there are reasons to worry about these capabilities.<sup>2</sup> Global Positioning Systems (GPS) are an indispensable mechanism of both civil and military systems, and therefore, satellites are the cornerstone of technology-enabled lifestyles. Their disruption would be the primary goal of an adversary in odd times, and hence, it becomes fundamental for a state to protect their satellites from disruption. Anti-Satellite weapons, commonly known as ASATs, try to destroy the satellites in orbit.

The potential ASAT that Russia is developing aims to launch a nuclear weapon in space to take down crucial US satellites that serve communication, military operations, navigation, and intelligence gathering. The report suggests that Russia is working to develop an electromagnetic pulse (EMP) with nuclear explosion.<sup>3</sup> If launched successfully, it would destroy and leave a huge orbital real estate, that the world relies on, redundant.

ASAT capabilities have been around almost parallel to the invention of satellites. In 1957, when the USSR launched the world's first satellite, Sputnik, their Cold War rival, the United States responded with the first-ever ASAT weapon, 'Bold Orion', which is an air-launched ballistic missile. This resulted in an unintended race of ASATs, where the Soviets responded with their own ASAT capabilities. The Soviets developed 'Co-Orbital' ASATs, they fly alongside the satellites and eventually explode, taking the satellite along with them.<sup>4</sup>

Like all other technology, ASATs also continued to evolve and saw new entrants. China too fired a ballistic missile in 2007 to destroy an old satellite. These unending tests have resulted in a plethora of debris in the space. The United States took the lead and announced in 2022, that it would discontinue the missile use against satellites.<sup>5</sup> This was an important action given the possibilities of Kessler Syndrome, where debris in space could reach a point where it creates more and more junk, wreaking havoc for any kind of space program, as suggested by NASA scientist Donald Kessler in 1978.<sup>6</sup> European Space Agency has launched the 'Clean Space Initiative' to tackle this issue.<sup>7</sup> Four countries, including China, India, Russia, and the US have destroyed their own satellites in ASAT tests.

However, Russia in November 2021 tested a direct ascent ASAT against a live satellite. This test and the debris thus created garnered plenty of international concern and the question around the declining sustainability of Space resurfaced.<sup>8</sup> The test put into question the human-made objects in Low Earth Orbit (LEO) along with China's Tiangong Space Station and International Space Station.

The recent speculations about Russia developing new ASATs violate the Outer Space Treaty (OST). Article VII of the treaty holds states responsible for damaging the satellites of other states, while Article IX prohibits parties from causing 'harmful contamination' of space.<sup>9</sup> In the past, the United States detonated a thermonuclear bomb 400km above ground in a high-altitude test named 'Starfish Prime'. It was a joint effort of the Defence Atomic Support Agency and the Atomic Energy Commission (AEC). It is the largest nuclear test conducted in space to date. However, this test precedes the OST, which was conceived in 1967. Since then, there has not been any nuclear activity in the space. There are other treaties like the Liability Convention 1972 and the Registration Convention 1976 that aim at addressing the issues of Outer Space.<sup>10</sup>

There has been a constant demand to have a new outer space treaty which can actively address emerging trends like the weaponisation of space, an unprecedented spike in the number of satellites, active involvement of the private sector, resource exploitation, and the issue of space debris. These issues would need increased international cooperation, effective governance, innovation, and risk mitigation mechanisms in outer space. The last development in this regard was the UN guidelines and framework agreed upon in 2022 on the issues of long-term sustainability of outer space activities and nuclear power safety along with mitigation of space debris, transparency and confidence building measures (CBM) in outer space.<sup>11</sup>

The recommendation for the new treaty includes a legal framework and jurisdiction for environmental pollution in space, an effective framework for exploration activities on the Moon and other celestial bodies, prevention of arms conflict in space, and bringing binding and non-binding norms to address the question of emerging risks pertaining to safety, security, and sustainability of the outer space.

### **India's ASAT Profile**

In March 2019, India conducted its first ASAT missile test called 'Mission Shakti'. India used the Defence and Research Organisation's (DRDO) Ballistic Missile Defence Interceptor as a kinetic ASAT missile. ASATs are generally of two kinds, kinetic energy, and non-kinetic type. The kinetic energy ASATs cause direct physical damage by crashing into satellites and includes anything that

can enter space and damage the satellites, including drones, ballistic missiles, and other satellites.<sup>12</sup> Whereas, the non-kinetic type uses non-physical attacks like jamming, cyber-attacks, blind satellites with laser, etc. and can be carried out from LEO, ground installations, or from the air.

India is only the fourth country after Russia, the US and China to have ASAT capabilities. This increases India's capabilities in the face of a war and reserves a seat for India in the international conversations on ASATs. This has been one of the many developments that India is making in the domain of space, and the missions lined up would further boost its capabilities and credentials.

Whereas, the Russian EMP can have devastating impact on the global space including economic impact as Industries has huge reliance on satellite communication, such as shipping, aviation, finance, and agriculture, could suffer losses due to interruptions in service and increased operating costs. In addition, it would likely strain diplomatic relations and could lead to retaliatory actions or international sanctions. It could also undermine trust in international agreements aimed at preventing the militarization of space. Therefore, efforts to prevent such an attack and to strengthen the resilience of space systems against EMPs are essential for safeguarding global security and stability.

## NOTES:

<sup>1</sup> Sandra Erwin, "White House confirms it has intelligence on Russia's anti-satellite weapon, but says no immediate threat," *Space News*, February 15, 2024, [White House confirms it has intelligence on Russia's anti-satellite weapon, but says no immediate threat - SpaceNews](#). Accessed on February 21, 2024.

<sup>2</sup> Katherine Tangalakis-Lippert, "Reports of Russia building nuclear space weapons have alarmed officials, but security experts aren't panicked — yet," *Business Insider*, February 19, 2024, [Reports of Russia building nuclear space weapons have alarmed officials, but security experts aren't panicked — yet | Business Insider India](#). Accessed on February 21, 2024.

<sup>3</sup> Rajagopalan, "Why Russia's Latest Space Weapon Is So Dangerous," *The Diplomat*, February 17, 2024, [Why Russia's Latest Space Weapon Is So Dangerous – The Diplomat](#). Accessed on February 21, 2024.

<sup>4</sup> Smith, "Anti-satellite weapons: History, types and purpose," *SPACE.COM*, August 10, 2022, [Anti-satellite weapons: History, types and purpose | Space](#). Accessed on February 21, 2024.

<sup>5</sup> Gohd, "Russian anti-satellite missile test was the first of its kind," *SPACE.COM*, August 10, 2022, [Russian anti-satellite missile test was the first of its kind | Space](#). Accessed on February 21, 2024.

<sup>6</sup> International Association for the Advancement of Space Safety, "Kessler Syndrome," *Space Safety Magazine*, [Kessler Syndrome – \(spacesafetymagazine.com\)](#). Accessed on February 21, 2024.

<sup>7</sup> "Clean Space," The European Space Agency, [ESA - Clean Space](#). Accessed on February 21, 2024.

<sup>8</sup> Ankit Panda, “The Dangerous Fallout of Russia’s Anti-Satellite Missile Test,” The Carnegie, November 17, 2021, [The Dangerous Fallout of Russia’s Anti-Satellite Missile Test - Carnegie Endowment for International Peace](#). Accessed on February 21, 2024.

<sup>9</sup> “Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,” United Nations Office for Outer Space Affairs, [The Outer Space Treaty \(unoosa.org\)](#). Accessed on February 21, 2024.

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<sup>11</sup> “Inter-Agency Meeting on Outer Space Activities: 2022, Forty-first session,” United Nations Office for Outer Space Affairs, [UN-Space 2022: 41st session of the Inter-Agency Meeting on Outer Space Activities \(unoosa.org\)](#). Accessed on February 21, 2024.

<sup>12</sup> Doris Elin Urrutia, “India's Anti-Satellite Missile Test Is a Big Deal. Here's Why,” SPACE.COM, August 10, 2022, [India's Anti-Satellite Missile Test Is a Big Deal. Here's Why. | Space](#). Accessed on February 21, 2024.

