Outer Space Treaty

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Why is in news? Is Russia testing a new anti-satellite weapon?

On February 14, the chairman of the House Intelligence Committee of the U.S. House of Representatives, Mike Turner, called the media's attention to "information concerning a serious national security threat" and urged President Joe Biden to declassify it so more experts could be recruited to mitigate the danger it allegedly posed.

A flurry of news reports followed, quoting various sources and referring to some kind of Russian space-based weapon.

Outer Space:

Outer space, also known as space or celestial space, refers to the vast expanse beyond Earth's atmosphere and between celestial bodies.

It is a **vacuum that exists beyond the Earth's atmosphere and extends indefinitely** throughout the universe.

Outer space is characterized by **extremely low density and pressure**, as well as the **absence of air and other atmospheric elements.**

UN Treaties:

The treaties commonly referred to as the "**five United Nations treaties on outer space**" are:

Outer Space Treaty 1967: Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

Rescue Agreement 1968: Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space.

Liability Convention 1972: Convention on International Liability for Damage Caused by Space Objects.

The Registration Convention 1976: Convention on Registration of Objects Launched into Outer Space.

The Moon Agreement 1979: Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

India is a **signatory to all five of these treaties but has ratified only four**. India did not ratify Moon agreement.

Features of the Outer Space Treaty:

Prohibition of placing weapons of mass destruction in space or on any celestial body.

Limits use of celestial bodies to peaceful purposes

Prohibits use of celestial bodies for testing weapons of any kind, establishing military bases or conducting military maneuvers of any kind

Forbids any country from claiming a resource from any celestial body as its own and treats them as common heritage of mankind

Makes countries liable for any damages caused by their space objects.

United Nations Office for Outer Space Affairs (UNOOSA):

It is the **UN office responsible for promoting international cooperation** in the **peaceful uses of outer space**.

It forms part of the United Nations Office **at Vienna** and serves as the Secretariat for the UN General Assembly's only committee dealing exclusively with those issues: the Committee on the Peaceful Uses of Outer Space.

Functions:

UNOOSA implements the **United Nations Programme on Space Applications (PSA**).

Under the Programme, UNOOSA conducts training courses, workshops, seminars and other activities on space applications.

On behalf of the UN Secretary-General, UNOOSA maintains the Register of Objects launched into Outer Space and disseminates via its website that information recorded in the Register.

It also prepares and distributes documents, reports, studies and publications on various aspects of space science and technology applications and international space law.

It works to **improve the use of space science and technology** for the economic and social development of all countries, particularly developing countries.

Anti-satellite weapons:

Anti-satellite (ASAT) weapons are designed to **debilitate and/or destroy satellites** that are **already in orbit and operational**.

ASAT weapons **violate the OST** through the latter's Article VII, which holds parties to the treaty liable for damaging satellites belonging to other parties, and Article IX, **which asks parties to refrain from** the "harmful contamination" of space.

Some of the examples of space-based nuclear weapons:

In a high-altitude test in 1962 called **Starfish Prime**, the U.S. detonated a thermonuclear bomb 400 km above ground. It remains the largest nuclear test conducted in space.

A **Thor rocket** launched the warhead to a point west of Hawaii, where its detonation had a yield of 1.4 megatonnes.

More importantly, it set off an **electromagnetic pulse (EMP)** much larger than physicists had expected, damaging a few hundred street-lights in Hawaii, 1,500 km away.

The charged particles and radiation emitted by the blast became ensnared in and accelerated by the earth's magnetic field, distorting the ionosphere and resulting in bright aurorae.

Starfish Prime was part of the U.S.'s high-altitude nuclear tests in 1962.

The Soviet Union also conducted such tests around then with similar effects. For example, Test 184 on October 22, 1962, detonated a 300-kilotonne warhead 290 km above ground.

The resulting EMP induced a very high current in more than 500 km of electric cables and eventually triggered a fire that burned down a power plant.

Impacts of nuclear weapon on satellites:

The principal threats to other satellites from a space-based nuclear weapon are the **EMP and the release of charged particles.**

An EMP from a nuclear weapon in space will **affect all satellites around the point of detonation**, including Russian satellites, those of its strategic allies (such as China), and of countries not involved in a particular conflict. It would also **grossly violate the OST**.

Depending on the **strength, location, and directedness** of the explosion, it could also blow a large number of satellites to pieces, more than what a 'conventional' kinetic ASAT weapon might.

The damage is **not immediate** to most [satellites] but rather caused by new and intensified radiation belts. However, researchers have been working on tamping down disturbances caused by space-based nuclear explosions in radiation belts around the earth through a process called radiation-belt remediation.

Eventually, the result is **more dud satellites and debris**, raising **concerns of the Kessler effect**: when there is a certain level of debris in low-earth orbit, collisions among themselves as well as with other satellites could produce more debris, leading to a "collisional cascade" that rapidly increases the amount of debris in orbit.

India - race for space power:

INCOSPAR was created under the department of atomic energy in 1962. This was further reconstituted as the Indian space research organization (ISRO) in 1969.

Defence Space Agency (DSA) was created in 2019. It is expected to act as a full-fledged aerospace command.

Defence Space Research Organisation is also expected to be established. It is expected to undertake research and development as per the strategy and policy developed by the DSA.

Mission shakti (Anti Satellite Missile Test)-India is now the fourth country in the world to conduct ASAT missile test after the US,Russia, and China

Way forward:

The **necessity of a strong legal framework** existing space laws should be revisited to develop a new legal framework to address concerns about the weaponization of outer space.

In order to **increase situational awareness of space objects already in space**, states should submit valid information to international institutions. This data can be further reorganized and provided as open-source information to all.

Technology transfer legitimate access for all states to outer space and provision of training and access to technology without discrimination should be promoted.

Transparency and confidence building measures can help maintain space security by complementing a negotiated international legal instrument on outer space arms control.

India can **take leadership and use international platforms** for negotiating a treaty for the peaceful use of outer space.

Conclusion:

Modern civilisation depends heavily on satellites, which means they can be assets or vulnerabilities. But the inability to target a nuclear weapon in space — at certain satellites over others — mitigates its usefulness.

This is why some security researchers have suggested that if the Russian capability is nuclear, it will be a weapon of last resort. Some others have said the ‘nuclear’ component is likely to be limited to the power source