

Mission Shakti

[UPSC Notes]

What is Mission Shakti?

Developing an anti-satellite missile was the indigenous technological project of DRDO and ISRO to strengthen India's space warfare capabilities successfully.

- India tested a Mission Shakti Anti-satellite system from Dr A P J Kalam Island, which used to be known by the name called wheeler island, Odisha. 27 March 2019
- This day was documented and inscribed in the books of history because India successfully destroyed a live satellite that was at an altitude of 300km in the lower earth orbit (LEO).
- The Anti-satellite (ASAT) System is the missile-based technology to destroy live satellites; it can be of two types, namely based on launching from a plane or launching from the ground.
- ASAT missiles can be air-based, land-based, and sea-based.
- After receiving the green signal from the government, a new three-stage missile was independently developed for the ASAT test with two rocket boosters having a weight of 18 tons and a measurement of 13 meters.
- Anti-satellite missile India wins the ticket for India to enter into the pace-superpower league, joining three other countries. India also has the power to destroy or annihilate satellites for defensive purposes. Although India has also made its stand very clear that India follows a defensive strategy, this is a defensive move rather than an aggressive one.

Anti-Satellite Missile in India

There are namely two types of ASAT- Kinetic and Non-kinetic.

- More like ballistic missiles, kinetic missiles also physically strike an object and then destroy them.
- Exact location and speed of the satellite in real-time need to be known in order to strike it.
- ASAT missile is launched based on the speed of the satellite and the orbit in which the satellite is moving.
- The missile stays updated about the real-time position of the satellite in orbit every second.
- Based on all this information missile heads toward the satellite.
- A missile consists of a kinetic kill vehicle that hits the satellite after sensing it.
- ASATs that use ways that are not physical to destroy space objects, like frequency jamming, and cyber-attacks, are called non-kinetic ASATs.
- Satellites not under the range of 20,000 km are out of the range of ASAT.

Importance of Mission Shakti Anti Satellite

Nowadays, the satellite-based system covers a vast range of crucial applications like broadcasting, business, banking system, weather forecast, navigation, stock market, disaster management, communication system, etc.

Destruction of the satellite would shake the existence of all these applications rendering them useless. The good thing about the space warfare tool ASAT is that it can destroy the infrastructure of the enemy country without harming the lives of civilians.

It was an attempt to boost the capability of India to safeguard its security and safety.

Mission Shakti and its accomplishment

The satellite is known to travel at 28 times the speed of sound. Therefore, the destruction of such a kind of satellite by using a ballistic missile is no less than a great achievement for the space security of any country.

Such a massive success in ASAT requires exceptionally brilliant capabilities in missile and space technologies. Nuclear Missile deterrence can be created by the ASAT, and destruction of incoming missile can also be done by its use.

Tracing Back the Roots of ASAT

In October 1959, when the satellites were making an entry into space, the United States of America(U.S.A) tested its Anti-satellite weapons.

- B-47 bomber of the U.S. Air Force at Explorer VI satellite fired a missile which, according to the reports of the Federation of American Scientists, was an air-launched ballistic missile.
- Solwind P78-1 was USA's satellite that was destroyed by the AGM-135. USA tested AGM-135 in 1985, launched by an F-15 fighter jet.
- To destroy a defunct spy satellite in 2008 USA carried out an operation called "operation burnt" using an SM-3 missile.
- The Soviet Union became the second country to test the A-SAT technology, which conducted its first test in 1963, even though they started digging into Anti-Satellite Weapons in the 1950s.
- The Soviet Union conducted at least 20 tests of the ASAT system, where they recorded all the successes and failures.
- By using a killer satellite that would enter the same orbit as its target and move forward for its destruction, the soviet union adopted this new method known as a co-orbital method.
- China came third in this race to enter; in January 2007, it also carried out an ASAT test and ended up destroying an old weather satellite which was in high polar orbit and, as a result, created the highest orbital debris cloud ever created, making it more than 3000 objects in the space. And then, India was added to this list on 24 March 2019.

Response of other Countries to Mission Shakti

China and the USA expressed their concerns over peace and harmony in common outer space.

- Space debris from the satellite, which was destroyed by ASAT in orbit, remained the main concern of the USA after the test was done.

- India made sure the space debris left in orbit fell back to earth within weeks of conducting the test, mainly because it was in the lower earth orbit.
- The US also said that India and USA share common interests in space, scientific and technical matters. It will continue to persist these interests with India along with the collaboration on security and safety in space.
- Pakistan had also spilt over some concerns regarding the peace and tranquillity of space and had said that space belongs to mankind; it is a common heritage of humans, and every country must avoid conflict, which can lead to the militarization of space.
- It was clearly stated by the Ministry of External Affairs at the time that India does not support the weaponization of outer space; rather, it supports the International agenda of safeguarding outer space assets and maintaining the safety and security of external space.
- India has always upheld that space must be used for peaceful objectives only.

International Treaty Concerning Mission Shakti

Outer space treaty of 1967 (United Nations): It does not allow the countries to place any objects around the earth which carry nuclear weapons or any kind of weapons having the power of mass destruction.

It also restricts the use of such kinds of weapons on celestial bodies in outer space. "The moon and other celestial bodies shall be used by all state parties to the treaty exclusively for peaceful purposes."

Meanwhile, it should also be noted that India, while testing ASAT, did not violate any treaties because the ASAT mission does not generate energy by blasting or by causing mass destruction. While destroying the satellite, space debris gets generated, which is very harmful to the operational satellite and outer space.

Challenges Of Mission Shakti

This can be called a loophole in space technology since even after striking down each one of the satellites of a nation; it still might not be able to destroy the military communication of the enemy nation because nations use mediator satellites for their various needs, so they will simply use another nation's satellite.

Mission Shakti and Future Implications

India advocates the peaceful approach to the use of outer space because it is the place of a common heritage for all countries. However, it will not amend the fact that space is being used by many countries like US and China for military purposes.

- China made a massive expansion in space capability, and it operates approximately 70 military satellites in orbit, which perform various activities like intelligence, communication, etc.
- Under Central Military Commission, China integrated space, electronic warfare, and cyberspace by establishing a Strategic Support Force (SSF) in 2015
- After keeping in mind the scenario of the military utility of outer space, India is taking steps for its security interest.

- In 2001, India implemented a space-based surveillance program. Also, India constituted an Integrated space cell (ISC) in 2009 under Headquarters Integrated Defence Staff (HQ IDS) to coordinate space-related aspects of defence forces.

Some Facts About Mission Shakti

As per official citations, Microsat, a micro-satellite launched by ISRO in January 2019, was the satellite that was knocked out in the ASAT test.

- There is almost 6,00,000 debris of over 1cm travelling at a speed faster than a bullet which the satellites in outer space have to avoid.
- Before conducting the test, Notice To Airmen (NOTAM) had been sent by India to the airline authorities of all the countries to intimate them about the missile test which India was going to conduct.
- India is a signatory to the Treaty of 1967 (United Nations) and ratified it in 1982.

