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India's A-SAT test and what it tell about the country's capability to shoot down Ballistic Missiles

The A-SAT test was about more than just intercepting a satellite in orbit, it was also about India's improving ballistic missile defence capabilities.

By Prakhar Gupta

On 27 March, after keeping the nation on tenterhooks for an hour amid serious tensions with Pakistan post the Balakot airstrike, Prime Minister Narendra Modi announced in a live television broadcast that India has joined an exclusive club of 'space superpowers' by demonstrating a strategic capability that few countries possess. Usually in news for putting a satellite, or 104, in orbit, this time India had destroyed one using an anti-satellite (A-SAT) weapon, demonstrating its ability to hit targets in space.

In a stealthy planned mission, approved sometime around 2017, the Prithvi Defence Vehicle Mark-II of the Defence Research and Development Organisation (DRDO) struck a live satellite, launched into a sun-synchronous orbit in January this year, at a deliberately low altitude of 282 kilometres. The configuration of the missile, which the DRDO suggests was developed specifically as an A-SAT weapon, remains largely unknown. What's clear, however, is that some critical technologies developed for India's Ballistic Missile Defence (BMD) programme feed into this mission.

And if Modi's televised speech on this occasion is anything to go by, the A-SAT test was about more than just intercepting a satellite, it was also about India's improving BMD capabilities. Modi dubbed the A-SAT test as 'Mission Shakti', a moniker similar to the one given to India's 1998 nuclear tests — Operation Shakti. While the two are not comparable, Modi's message wasn't lost on anyone. Two, he laid special emphasis on the promptness of the weapon system, which used BMD components, stating the fact that the mission was completed in less than three minutes. For a ballistic missile interception to be successful, timing is critical.

India's BMD Programme

India's BMD, which has now been in development for nearly two decades, is structured as a two-layer system. It currently has two interceptor missiles — the Advanced Air Defence (AAD) missile for endo-atmospheric interception and the Prithvi Defence Vehicle (PDV) for exo-atmospheric interception. The AAD interceptor is meant for terminal phase interception — that is after the missile re-enters the earth's atmosphere. The PDV has been designed for mid-course interception — that is killing an incoming ballistic missile in space after its rocket burns out.

Under the first phase of the BMD programme, India has developed the capability of intercepting ballistic missiles which have a range of up to 2,000 km in both endo-atmosphere and exo-atmosphere in the altitude range of 20 to 40 km and up to 150 km respectively. This phase of the BMD has been tested 13 times and, by some accounts, is ready for operational deployment.

In 2014, it was reported that the DRDO was working on "a missile launch pad in Alwar and a missile interception base in Pali district". Similar reports appeared in 2017, saying the government had approved two villages in Rajasthan's Alwar and Pali districts for the installation of, what reports said, was a "ballistic missile defence grid". The forest department, reports said back then, had cleared 850 hectares of land in Alwar district and 350 hectares in Pali district in 2014 for this project. There were

no reports of movement on this front since. But on 22 April this year, less than a month after the A-SAT test, it was reported that the development of the first phase of India's BMD system has been completed and a nod for the deployment of "active missiles" will be given soon.

Modi's messaging was not an exaggeration, after all.

The second phase of the project is aimed at the interception of ballistic missiles with ranges up to 5,000 km and at an altitude of up to 400 km. Now, recall that during India's A-SAT test, PDV Mark-II destroyed the target satellite at an altitude of nearly 300 km and a closing velocity of 9.8 km per second. Moreover, the DRDO has come on record to say that the A-SAT missile has a range of over 1,000 km. Add to this the fact that striking a satellite requires more stringent accuracy as, at the given altitude, it travels significantly faster than a ballistic missile. Therefore, India's A-SAT test of 27 March is an indication that India has moved closer to acquiring the capability for exo-atmospheric interception of long-range missiles in their mid-course.

The mid-course phase of a ballistic missile's flight (the other two phases being boost — when the missile is thrusting to gain the velocity needed to reach its target — and terminal) offers the best opportunity for interception. Since this is the longest phase of a ballistic missile's flight, a country with mid-course interception capabilities will have relatively more time to decide and respond than one which has, say, the option of interception in terminal phase. Given that the interceptor has more time to engage, fewer interceptor sites are needed to defend larger areas. Moreover, in this phase, the missile is no longer thrusting, so its trajectory becomes relatively more predictable.

But that said, it must be noted that A-SAT and BMD technologies overlap only to a limited extent. Technologically, it is much more easier to target and destroy a satellite in orbit with an interceptor missile than it is to kill an incoming ballistic missile with it — often described as 'hitting a bullet with a bullet'. For one, a satellite in orbit moves along a predictable trajectory without performing evasive manoeuvres. For another, satellites have a relatively larger radar cross-section than a missile target, which makes their detection from ground easier. Moreover, during the A-SAT test, there were no decoys or other countermeasures to deflect the interceptor, which is unlikely to be the case, especially during a mid-course interception.

Most BMD tests conducted by India, including the latest one on 12 March, which some suggest may have actually been a failed A-SAT test — a claim DRDO has rejected — have been conducted in highly controlled conditions and the targets were electronically simulated in many cases. On some occasions, the short-range Prithvi missile has been used as the target, rather than an actual medium range ballistic missile. When the country is at war, such animated conditions will not exist. That India may have downed its own Mi-17V-5 helicopter while pushing back the intruding Pakistani fighter jets a day after the Balakot airstrike shows how blinding the fog of war is. Hence, despite success in recent years, India's BMD capabilities are not mature yet. What the A-SAT test has essentially done, in this context, is remove some doubts, even if modestly, about the effectiveness of India's BMD capabilities at higher altitudes. The A-SAT test was India's highest altitude exo-atmospheric interception ever.

BMD As Part Of India's Nuclear Strategy

Most countries which develop and deploy a BMD system suggest that it is intended towards preventing damage from enemy missiles. However, BMD systems are leaky. Consider US' ground-based midcourse defense (GMD) system, which has been tested at least 18 times between 1999 and 2017. It missed targets as many as eight times, bringing its success rate to around 56 per cent. Not to mention that these tests are performed in a highly controlled environment. Moreover, their effectiveness can be degraded by overwhelming or saturating them using a massive volley of missiles, MIRVing (mounting multiple warheads on one delivery platform) and use of decoys. Therefore, at best, missile defence systems can only limit damage to an extent.

So, where does BMD fit into India's nuclear strategy?

India has a declaratory no-first-use nuclear posture. But, scholars say, there is growing evidence to suggest that New Delhi has been developing diverse capabilities needed to pursue a more flexible nuclear policy vis-a-vis Pakistan, one that gives it options beyond countervalue targeting (that is, striking enemy's cities and civilian population) — namely, counterforce (that is, taking out enemy's strategic nuclear forces, and its command and control infrastructure before it launches its weapons).

Scholars also cite statements made by some former Indian national security official to suggest that India's nuclear strategy could be changing. One of the most recent of these statements is by Lieutenant General B S Nagal (retired), a former commander of the Strategic Forces Command, responsible for India's nuclear assets, who has argued that India should abandon its no-first-use policy in favour of "ambiguity".

To adopt counterforce targeting, India needs a set of capabilities, and US-based scholars Christopher Clary and Vipin Narang say it has been slowly putting these in place. As evidence, they point to: one, the development of more (both in terms of type of missile systems and the number of each type) and preciser delivery systems, including submarine-launched ones; two, the MIRVing of missiles, which makes striking more than one target using a single delivery platform possible; three, improvement in Intelligence, Surveillance and Reconnaissance (ISR) capabilities, including satellites which can capture imagery of 0.6- and 1-metre resolution to spot deployment of nuclear forces on the ground; four, a much more responsive command and control structure, including canisterisation of missile systems in which nuclear warheads are likely pre-mated. The BMD shield is one of these capabilities.

The debate on India's alleged tilt towards counterforce is far from over. But if New Delhi ever decides to go for a counterforce strike against Pakistan, the aim would be to disarm Rawalpindi entirely by destroying all its nuclear warheads, delivery systems and the command and control infrastructure required to use it. However, a small part of Pakistan's nuclear force escaping such an attack can't be ruled out. In such a contingency, the BMD shield would be deployed to intercept this residual nuclear force. Given that Pakistan would lose most of its nuclear force and command and control structure in such an attack, it would not be able to overwhelm the BMD shield.

(Prakhar Gupta is a senior sub-editor at Swarajya. Follow him @prakhar4991.)

<https://swarajyamag.com/magazine/indias-a-sat-test-and-what-it-tell-about-the-countrys-capability-to-shoot-down-ballistic-missiles>



Fri, 03 May 2019

Post ASAT test, Armed Forces get training in space warfare

The A-SAT test was about more than just intercepting a satellite in orbit, it was also about India's improving ballistic missile defence capabilities.

By Prakhar Gupta

New Delhi: More than a month after India conducted the anti-satellite (ASAT) test, serving officers of three armed forces are now undergoing a training workshop on "space warfare and technology".

A two day workshop organised by the Directorate of Indian Defence University (IDU) commenced today. It is for senior and middle-level officers from the three services.

The workshop will cover weaponisation and militarisation of space, preparation for absorption of high-end technology for self-sustenance in space operations, space innovations and technology exploitation, inertial navigation systems and sensors.

It will also explore legal aspects of military use of space. It will aim at building capacity — adversarial capability in space domain and the way forward for Indian armed forces.

Besides senior military personnel, the officers will be addressed by eminent speakers from the industry, academia, IITs, ISRO, DRDO, think tanks and services to share their pragmatic knowledge and research on various aspects of space warfare and technology.

This workshop is relevant especially in light of Defence Space Agency being raised and three Services energising their own capabilities. It is to be seen as to how the Defence Space Agency will fit in the entire gambit of space domain utilisation in our country and efficiently perform its role for which it is being raised.

<https://www.tribuneindia.com/news/nation/post-asat-test-armed-forces-get-training-in-space-warfare/767243.html>



Fri, 03 May 2019

In a first, Sukhoi Jets operate at civilian airports in eastern sector

The air force has identified airports in Kolkata and Durgapur in West Bengal, Guwahati in Assam, and Aizawl in Mizoram for round-the-clock operations of Sukhoi Su30s, which are currently India's most advanced fighter jets.

By Ratandip Choudhary

Guwahati: Sukhoi Su30 fighter jets will fly from civilian airports in Bengal, Assam and Mizoram over the next two days in a first-of-its-kind exercise that the Indian Air Force says will improve wartime preparedness.

The air force has identified airports in Kolkata and Durgapur in West Bengal, Guwahati in Assam, and Aizawl in Mizoram for round-the-clock operations of Sukhoi Su30s, which are currently India's most advanced fighter jets.

"For a Sukhoi Su30 class aircraft, this is the first time they are conducting drills from Guwahati or any other civil airfield in the northeast. Our focus was more on the western front earlier, but we are now increasing our focus in the east since our eastern neighbour is increasing its capabilities, and we need to have a serious deterrent in order to emulate any threat that may emerge in the future," Air Commodore Sashank Mishra told NDTV.

IAF fighter aircraft in the eastern part of the country mostly comprise squadrons of Sukhoi Su30 MKI fighter jets, which operate from military airfields in Tezpur and Chabua in Assam. IAF also has Hawk trainer jets operating at the Kalaikunda air base in West Bengal.

As the Indian Air Force prepares to induct the first batch of Rafale fighter jets - expected later this year - some of the new combat aircraft are likely to be based at the Hasimara air force station in West Bengal, from where the MiG-27 fighter jets are expected to be phased out.

"We are overhauling our capabilities to accommodate Rafale jets, and newly-acquired attack helicopters," Air Commodore Mishra said.

As part of this exercise, fighter pilots and crew will coordinate and train to operate from major civilian airports. This is also being done to be fully prepared to for an eventuality where the IAF may need to shift operating bases at a moments notice from a military air field to a civilian airport.

"The idea is to build synergy between civilian Air Traffic Control and IAF pilots so that they can use civil airfields if the main base of the IAF is attacked," Air Commodore Mishra said.

The drill will give the Indian Air Force more flexibility, while the crew and air force personnel will be able to formulate procedures and coordinate with civilian air traffic simultaneously. The pilots will also familiarise themselves with the operating procedures at civilian airports and get exposure to a different environment besides adapting to other factors which come into play while operating away from a military base.

<https://www.ndtv.com/india-news/in-a-first-sukhoi-fighter-jets-operate-at-civilian-airports-in-eastern-sector-boost-iaf-preparedness-2031743>

THEWEEK

Fri, 03 May 2019

India's 4th Scorpene Submarine to touch waters on May 6

INS Vela was under construction at Mazagon Dock Limited, Mumbai

In a bid strengthen Indian Navy's underwater capability, a fourth submarine of the Scorpene class is going to touch waters next week. Named as INS Vela, the submarine, under construction at Mazagon Dock Limited (MDL) Mumbai, has completed its out fittings and is going to be launched on May 6 in the Arabian Sea.

INS Kalveri, the first Scorpene was already inducted in 2017 while two other submarines—INS Khanderi and INS Karanj—are in the advanced stages to join the Navy fleet. The last two submarines—INS Vagir and INS Vagsheer—are in advanced stages of manufacturing on the assembly line at MDL.

The contract to build six submarines in India was signed in 2006 between the French firm Naval Group, formerly known as DCNS, and Mazgaon Dock Limited under Indian Navy's \$3 billion Project-75. The first submarine was scheduled to be delivered by 2012, but the project witnessed repeated delays.

"On May 6, the submarine will touch waters for the first time. Then the sea trials will begin," a Navy officer said.

The strength of the Indian Navy's submarine fleet has dwindled from a total of 21 submarines in the 1980s to 15 conventional submarines plus one homemade Arihant-class nuclear submarine and one Russian Akula-class submarine operating on lease. To make the situation worse, at a time, Indian navy is operating with half of its submarine fleet strength as most of the vessels are in the last leg of their active operational life and are on mid-life upgrades. The matter raises serious concerns when it is compared with neighbouring China, which has a strength of 65 subs.

The Navy needs at least 24 submarines to meet the 30 year submarine building plan, which was approved by the Cabinet Committee on Security in 1999, months after Kargil conflict. The approved acquisition programme was divided into three sections: first, six Scorpene submarines to be procured under the Project 75; second, additional six more submarines to be built under Project 75 India, and third, remaining 12 to be built indigenously.

The state-of-the-art technology utilised for construction of the Scorpene class submarines has ensured superior stealth features such as advanced acoustic silencing techniques, low radiated noise levels, hydro-dynamically optimised shape and the ability to launch a crippling attack on the enemy using precision guided weapons.

The Scorpene submarines can undertake multifarious types of missions i.e anti-surface warfare, anti-submarine warfare, intelligence gathering, mine laying, area surveillance etc. The submarine is designed to operate in all theatres, with means provided to ensure interoperability with other components of a Naval Task Force. It is a potent platform, marking a generational shift in submarine operations.

Besides enhancing Navy's underwater capabilities, the Scorpene class submarine project will be a big leap towards India's self reliance in the defence sector under the "Make in India" initiative. The Navy got its last Indian made submarine in early 1990s when two HDW class submarines—INS Shalki and INS Shankul—were joined the fleet.

India got its first of the eight Foxtrot class submarines, also known as INS Kalvari, on December 8, 1967 when it was commissioned at then Soviet Union's naval base Riga in Latvia.

The 66-metre long submarine is made up of a special kind of high-tensile steel which ensures that the warship can withstand high yield stress allowing it to dive deeper. The submarine can operate at a depth of 300 metres under water and travel 1,020 km underwater. It can carry 18 torpedoes and tube-launched anti-ship missiles underwater or from the surface.

<https://www.theweek.in/news/india/2019/05/02/india-4th-scorpene-submarine-to-touch-waters-on-may-6.html>



Fri, 03 May 2019

Curtains down on missile destroyer INS Ranjit on May 6

By JBS Umanadh

Hyderabad: On May 6, a glorious era of INS Ranjit as the frontline missile destroyer of the Indian Navy will come to an end. INS Ranjit, the third of the five Kashin-class destroyers built by erstwhile USSR was commissioned in 1983 and has rendered yeoman service to the Indian Navy for over 36 years.

The ship will now be decommissioned in a solemn ceremony at the Naval Dockyard, Visakhapatnam. The ceremony will be attended by personnel who have served onboard INS Ranjit in the past and will also include officers and sailors from the commissioning crew. The Chief Guest for the ceremony will be Admiral Devendra Kumar Joshi (retired), Lieutenant Governor Andaman and Nicobar.

INS Ranjit was built at Yard 2203 in the 61 Communards shipyard in the town of Nikolev in present-day Ukraine. The keel of the ship was laid on June 29, 1977, and she was launched on June 16, 1979. The ship was given its Russian name "Lovkly" which means "Agile". It was commissioned as INS Ranjit on September 15, 1983, with Captain Vishnu Bhagwat at the helm. The officer went on to serve as the Chief of Naval Sta during 1996-98.

In her maiden sortie, the ship traversed through the Black Sea, Mediterranean Sea, Red Sea and the Arabian Sea.

Over 36 years, the ship has the distinction of serving in both Western and Eastern seaboard and has been the Flag Ship of both the Western and Eastern Fleets. With a motto of "Sada Rane Jayate" (Ever Victorious in Battle), INS Ranjit has been at the forefront in keeping the nation secure.

The ship participated in a number of national security operations. Some of these include IPKF operations, Operation Talwar during Kargil conflict among others. In 2003, the ship was deployed to Mozambique to provide security cover to the African Union Summit. The ship was also actively deployed as part of the Navy's relief operations post-2004 Tsunami and cyclone Hud-hud in 2014. In recognition of her service to the nation, the ship was awarded Unit Citation in 2003-04 and 2009-10

<https://www.deccanherald.com/national/curtains-down-on-missile-destroyer-ins-ranjit-on-may-6-731853.html>

THE ECONOMIC TIMES

Fri, 03 May 2019

Navy shifts from re-active to pre-emptive mode: Vice Admiral

Mission success and safety need to be viewed as complementary to each other, said Vice Admiral A K Chawla, Flag Officer Commanding-in-Chief, Southern Naval Command.

Kochi: The Indian Navy has moved from a reactive safety strategy a few years back to a pro-active stance of pre-emption and prevention, Vice Admiral A K Chawla, Flag Officer Commanding-in-Chief, Southern Naval Command, said Thursday.

In his inaugural address at the annual safety review meet here, he said safety and operational effectiveness was mutually inclusive, which means safety provides the organisation the means to minimise loss and consequently enhance the probability of mission success.

Therefore, mission success and safety need to be viewed as complementary to each other, he said.

Top officials of the Navy have assembled here to participate in the meet in which they would review the various safety policies and plan to strengthen safety culture in the defence force, a press release said. The two-day meeting was being chaired by Vice Admiral G Ashok Kumar, Vice Chief of the Naval Staff.

The meet was inaugurated by Vice Admiral A K Chawla and was attended by senior officers from Integrated Headquarters Ministry of Defence (Navy), as well as representatives from various Command Headquarters, Area Commanders and safety class authorities, the release said.

The highlights of this year's meet were the release of Indian Navy Safety Management Manual and launching of the Indian Navy Safety Website, it said.

<https://economictimes.indiatimes.com/news/defence/navy-shifts-from-re-active-to-pre-emptive-mode-vice-admiral/articleshow/69146889.cms>

Defence Ministry likely to clear 10 Russian Kamov helicopters for Indian Navy

The DAC meeting, likely on May 3, is expected to clear the need for the choppers, valued at Rs 3,621 crore

Srinjoy Chowdhury

In what could be the last Defence Acquisition Council (DAC) meeting of this government, a clearance is likely for 10 Russian Kamov helicopters for the Indian Navy. The DAC meeting, likely on May 3, is expected to clear the need for the choppers, valued at Rs 3,621 crore.

As this is a "follow-on" order, which means that when a weapon system (in this case, the chopper) is already with the armed forces and more are needed, the lengthy process of trials has already been gone through and aren't really required again.

The DAC is headed by Defence Minister Nirmala Sitharaman and includes the three service chiefs, the defence secretary and the scientific advisor to the minister.

While major decisions are usually not taken during the elections, the Defence Ministry is an exception as there are national security issues involved. And it is more so this time, after Pulwama, the Balakot strike on February 26 and the subsequent attacks by Pakistani Air Force planes the next day.

<https://www.timesnownews.com/india/article/defence-ministry-likely-to-clear-10-russian-kamov-helicopters-for-indian-navy/411551>



Indian Navy pushing Rs 3,500 crore Kamov-31 chopper deal with Russia

The Navy already has a fleet of 12 of these Kamov-31 choppers which sanitise the air space around the aircraft carriers and destroyers operating in open seas.

New Delhi: Seeking to strengthen capabilities against aerial threats to its aircraft carriers and large warships, the Indian navy has moved a proposal to acquire 10 Kamov-31 choppers from Russia.

"The Defence Ministry is scheduled to take up over Rs 3,500 crore proposal for buying around 10 Kamov-31 Airborne Early Warning and Control choppers for the aircraft carrier operations and deployment future warships of the Gregorovich class," Government sources told ANI.

A high-level defence ministry meeting is also scheduled to discuss the revalidation of an Indian Coast Guard proposal for acquiring six maritime surveillance aircraft based on the C-295 aircraft platform which is likely to replace the Avro transport planes in the Air Force.

The Navy already has a fleet of 12 of these Kamov-31 choppers which sanitise the air space around the aircraft carriers and destroyers operating in open seas.

For the anti-submarine warfare operations, the Navy has a fleet of Russian Kamov-28 choppers along with the Seaking choppers which were procured long back In the 1980s and need to be upgraded for future operations.

The Narendra Modi led government has not let the election season affect the military modernisation plans as Defence Acquisition Council and Cabinet Committee on Security meetings are being held regularly to clear important acquisitions for the forces.

<https://zeenews.india.com/india/indian-navy-pushing-rs-3500-crore-kamov-31-chopper-deal-with-russia-2200529.html>



Fri, 03 May 2019

ISRO plans to land a rover on lunar south pole: Sivan

'A place where nobody has gone'

By T. K. Rohit

Chennai:India's second moon mission, Chandrayaan-2, will be historic for the scientific community as the country's space agency, the Indian Space Research Organisation (ISRO), attempts to land a rover on the lunar South Pole, a region on the moon to which no one has gone till now, ISRO Chairman K.Sivan said.

On Wednesday, ISRO said it had fixed a launch window between July 5 and July 16 to launch the moon mission on board a GSLV-MkIII, with an aim to land on the moon around September 6. If ISRO manages to successfully execute this, India will be the first country to land a rover on the moon's South Pole.

Deadlines missed

ISRO Chairman K. Sivan, in a short interview to *The Hindu*, said this was a region where nobody had gone before. "All the [ISRO] missions, whatever we have had till now [to the moon], have all landed near the moon's equator. This is a place where nobody has gone," he said.

After missing multiple launch deadlines, Mr. Sivan said the new launch window was almost final and that ISRO would launch the mission in July.

"When nobody has gone near that area, some new science might be there. Some new information, new science, we may get access to," he said. ISRO will reveal further details of its plans and goals for the Chandrayaan-2 mission in June, he said.

The South Pole of the moon has generated a lot of interest in the recent past, with countries aiming to reach the region in what could spark another race to the moon.

China is reportedly aiming to construct a moon research station on the lunar south pole, while the National Aeronautics and Space Administration (NASA) is working to send astronauts there by 2024.

Asked about China's reported proposal to build a research station there, he said, "What they [China] are going to do, we don't know. The main reason [why India is going there] is nobody has gone [to] that side till now."

According to NASA, some regions of the lunar South Pole have permanently shadowed craters with some of the lowest temperatures in the Solar System, where water ice is stable. These craters are believed to have significant ice deposits, "untainted by the Sun's radiation or geological processes."

Mr. Sivan said one of the goals of the Chandrayaan-2 mission would also be to find water on the moon.

<https://www.thehindu.com/sci-tech/science/isro-plans-to-land-a-rover-on-lunar-south-pole-sivan/article27016670.ece>