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Nirbhay cruise missile passes crucial test, but reliability still a question

The Nirbhay cruise missile, which the Defence R&D Organisation (DRDO) successfully test fired on Tuesday, is a version of America's iconic Tomahawk cruise missile, made famous by CNN videos of the 1991 Gulf War, showing Tomahawk's flying along Baghdad streets and entering target buildings through doors and windows.

Yet, despite Tuesday's success, Nirbhay remains an inconsistent performer. It has not yet demonstrated the reliability needed for launching nuclear weapons, which require a delivery platform that is both reliable and accurate.

Three of the four earlier Nirbhaya tests ended in failure, making the outcome of this test crucial for the continuation of the troubled DRDO project. Its test record contrasts unfavourably with that of the successful Indo-Russian BrahMos cruise missile, which has been in operational service since 2007 and will soon be carried by Indian Air Force Sukhoi-30MKIs.

The BrahMos has a range of 295 km (being upgraded to 600 km) and flies at supersonic speeds (Mach 3, or 3,700 km per hour). The Nirbhay's reach is longer (over 1,000 km), but it flies slower, at a subsonic speed of 865 km per hour. While that makes it vulnerable to enemy air defence guns and aircraft, its survivability rests on flying low – just 100 metres above the ground – making it difficult to detect with radar.

While Russian propulsion technology has powered the BrahMos missile, the Defence R&D Organisation (DRDO) continues to grapple with developing an adequate engine and pinpoint navigation systems for the Nirbhay.

So far, Pakistan leads India in subsonic cruise missile development, having tested and operationally deployed the Babur (Hatf VII) cruise missile that has a range of 700 km, significantly less than the Nirbhay's. Analysts speculate that the Babur's engine is Chinese, supplied by Beijing in violation of the Missile Technology Control Regime.

The Nirbhay can carry a payload of 300 kg, the weight of a well-designed nuclear bomb. It is 7.5 metres long, which would allow it to be carried inside a submarine. However, India has not claimed nuclear capability for the Nirbhay. In contrast, Pakistan portrays the Babur as a nuclear delivery platform.

"Perhaps India's anti-ballistic missile (ABM) defence that the DRDO is developing makes Pakistan present the Babur as a nuclear delivery platform to add credibility to its deterrent. Besides, Pakistan has no submarine launched ballistic missiles (SLBMs) and, therefore, plays up the Babur as a vehicle for assured submarine-launched, second-strike capability," says a well-known deterrence specialist with an Indian think tank.

Second-strike refers to a country's capability for assured nuclear retaliation after absorbing the full weight of nuclear attack from an adversary.

India's assured second-strike capability is based on the 750-km range K-15 SLBMs carried by INS Arihant, the navy's first sub-surface ballistic nuclear (SSBN) submarine. Arihant-class SSBNs (the second, INS Aridhaman, is nearing completion) are now being configured to carry the more capable K-4 SLBM, which has an estimated range of 3,500-4,000 km. It is doubtful whether the Nirbhay will ever form part of a SSBN's arsenal.

The Nirbhay's first test on 12 March 2013 was a failure. About 15 minutes into the test, the DRDO had to activate an on-board, "self-destruct" system after the missile deviated from its planned path and headed towards inhabited areas.

The Nirbhay's second test, on October 17, 2014, was an unalloyed success. In a 70-minute flight, the missile's inertial navigation system, assisted by the GPS satellite network, took the missile accurately to 15 pre-designated "way points. After 1,050 km, the missile splashed, as planned, into the Bay of Bengal.

But two successive failures followed this, one in 2015 and the preceding test last December. Perhaps, for that reason, the defence ministry release on Tuesday stated: "The flight test achieved all the mission objectives completely from lift-off till the final splash, boosting the confidence of all scientists associated with the trial."

Nirbhay sub-sonic cruise missile of Defence Research and Development Organisation takes off successfully from the Integrated Test Range at Chandipur in Odisha on Tuesday PHOTO: PTI

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IAF doubles down on air security in Capital

By Ajit K Dubey

Besides the systems to be acquired from foreign countries, the DRDO is also working on an indigenous missile defence project

Seeking to provide protection to country's vital assets and persons in the national Capital, the Indian Air Force is looking to install a two-layer air defence system which can take out enemy combat aircraft, drones or helicopters. The serving is working on the proposal in this regard which is expected to be brought to the Defence Acquisition Council — defence ministry's apex decisionmaking body on procurements — in its next few meetings, defence sources told Mail Today.

As part of the system, the Air Force is looking for a system which would also have the capability to take down enemy cruise missiles at a distance of 25 kilometers, and if that fails, then strike it down at lower level in the range of five to six kms, they said.

The new air defence system would be deployed to protect the important installations in the Capital, which will include the President's house, Parliament and other vital assets and vital points. Sources said the country has indigenous air defence systems such as the Akash missiles, but the DRDO was yet to develop a missile which can hit incoming targets at lower level heights in six to seven km range. In another deal to protect important cities and installations from attacks by the Chinese and Pakistani missiles and taking down enemy airborne early warning systems at ranges up to 400km, the air force is in the process of acquiring the deadly S-400 air defence system from Russia.

The service has completed the trials of the system and the commercial negotiations are going on between the two sides for its final price, which is expected to be in range of `37,000 crore-38,000 crore. Along with the systems to be acquired from foreign countries, the DRDO is also working on the indigenous Ballistic Missile Defence shield project, under which protection would be provided to key cities such as Delhi and Mumbai from incoming ballistic missiles.

Under the DRDO project, the plan is to take down the ballistic missiles coming in from long ranges, up to 2,000km or more at heights of 30 to 120 kilometres in the air, and the twin-layer system is in advanced stages of development. In the last few years, India has been taking significant steps to improve its air defence capabilities as a number of new mechanisms to take on hostile aerial action have been inducted and many more new systems would be joining in the near future. India recently started inducting the long-delayed `20,000 crore SPYDER missile systems into the Air Force and some of the systems have already been deployed on the western frontier to thwart any misadventure from Pakistan. In recent times, the NDA government has taken several measures for strengthening the air defence as it cleared a Rs.18,000 crore proposal to buy MR-SAM missiles for the army, while the three services are buying the very short range air defence systems which can fired from troops' shoulders.