NIRBHAY LACM: THE CASE FOR A PURE CONVENTIONAL ROLE

Arjun Subramanian P
Associate Fellow, CAPS

The successful test launch of an indigenously developed sub-sonic long range land attack cruise missile named 'Nirbhay' by DRDO has secured India's entry into the elite group of nations capable of indigenously developing this class of missile. In class it can be compared to the US Tomahawk LACM and the Chinese DH-10. However, the present range of Nirbhay is much lesser than the current versions of either. According to DRDO, air launched, ship launched and submarine launched versions will also be developed in the future.

Nirbhay: Sub-Sonic Land Attack Cruise Missile

Specification (Based on media reports and the parameters achieved in the second test):

Class: Ground Launched Land Attack Cruise Missile

Range: 800 to 1050 km[i]

Guidance: INS (ring-laser gyro and MINS)/GPS[ii]

Homing Sensor: N/A

Speed: Subsonic (Mach 0.7)

Power plant: Turbojet (initial thrust is provided by a rocket booster which is jettisoned before the turbojet engine takes over)

Payload: 350 kg

Warhead: Conventional/Nuclear

Cruise Altitude: 5 meters to 5 km[iii]

Launch Vehicle: TATRA Truck

The range estimate of the missile as reported by the media is between 700 and 1050 km. It appears that the targeted range for the test was 800 km, but, once the mission objective was achieved (i.e. the missile reached the target area), the missile was allowed to continue to check the maximum achievable range. It has been reported that the missile covered a distance of around 1050 km and splashed into the sea after it ran out of fuel.

Media reports stated the cruise altitude of the missile was 4.8 km and that the missile made some steep dive manoeuvres during the flight.[iv] Cruise missiles usually dive down to low altitude well before entering hostile airspace to avoid radar detection. At lower altitudes, the fuel consumption increases which results in a reduction in the range of the missile. The actual operational range of the missile is not known as the altitude profile of the missile along the entire trajectory is not available.

The missile is powered by a turbojet engine developed by the Gas Turbine Research Establishment (GTRE), which is also developing the Kaveri jet engine for the LCA. The DRDO, in 2006, proposed to develop the cruise missile, with an initial plan of converting the pilotless target aircraft Lakshya into a cruise missile. The shortlisted power plant was the Russian TRDD- 50 MT engine.[v] However, DRDO might have decided to go for indigenous development of the engine since Russia is a signatory of the MTCR which prohibits it from selling equipment and technology that could be used in a missile with range exceeding 300 km. In 2006 Russia had agreed to supply 200 NPO Saturn TRDD-50MT engines to India for Lakshya pilotless target aircraft.[vi]

According to DRDO, the missile has loitering capability. In the second test the missile had navigated precisely along 16 waypoints[vii] and it would not be a hard task to make it loiter, i.e. repeat some predefined waypoints over the target area. However, there is no mention of any terminal sensors in the missile. As per media reports the missile has Ring-laser gyro based INS and a Micro- Inertial Navigation System (MINS) aided by GPS. For loitering capability to be of any use terminal sensors like RF seeker or EO/IR seeker should be incorporated with the missile.

Case for a Pure Convention Role

The missile with a payload of 350 kg can carry both conventional as well as a nuclear warhead. DRDO and the media have been vociferously highlighting the nuclear capability of the missile. Indeed, Nirbhay sends a strong message to both China and Pakistan on our widening of choice of platform for n-attacks.

However, this also brings in an ambiguity that must be handled delicately. A few issues in this context that are worthy of consideration are presented in the following paragraphs.

Firstly, it is to be remembered that any future armed conflict with Pakistan will be fought under the nuclear shadow and one of the primary objective of our military would be to keep the conflict under the nuclear threshold. In this scenario, it might be counterproductive if the missile, projected to be a nuclear strike weapon is used for conventional strikes particularly if employed for pre-emptive strikes which could, due to the ambiguity of the payload, might invite a Launch Under Attack (LUA) response.

Secondly, there is no urgent need for the cruise missile as nuclear delivery vehicle. The present nuclear capable ballistic missiles are good enough for the nuclear deterrence role as neither Pakistan nor China have a functional ballistic missile defence system deployed to defend their country from a ballistic missile attack. Though China is working on a BMD system it would take a long time for it to deploy a workable ballistic missile system given the technological complexity and the history of ballistic missile development programmes world over.

Thirdly, a long range land attack cruise missile has immense value as a conventional precision strike weapon. A look at the use of Tomahawk cruise missile from the First Gulf War to the recent Libyan conflict would validate this point.

The Long range missile could be used as a,

- Stand-off first strike weapon to strike high value and highly defended targets deep behind enemy lines. Hitting the adversary's political and military high command during the opening hours of a conflict might have an immense psychological effect on the enemy.

- To perform Suppression of Enemy Air Defence (SEAD) with an aim to clear an air corridor for aircraft strike packages. This would reduce the attrition rate which would be a favourable factor in force planning and would make available the additional aircraft and resources for other vital roles, offering flexibility to the commander.

- This missile could fill the current void of stealth aircraft in the country's arsenal.

Few Thoughts and Suggestions

This is a remarkable achievement by DRDO which would prove to be a game changing weapon in our arsenal.

- The missile in the present configuration should be improved upon to make it more capable. Better capability would offer more options and flexibility to the commander. For this purpose, there should be strong collaboration between the services and the developing agencies.

- The services could simulate likely battle scenarios and could explore the possibility of using cruise missiles to achieve advantages based on which requirements could be drawn out to be worked upon by the missile developing agencies.

- An efficient C4ISR system which provides real time data relay would enable the missile to be used against time sensitive targets.

- The range of the future variants of the missile should be increased.

- Emphasis should be laid on developing homing sensors indigenously.

Notes

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies CAPS)

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[i] "No Flight of Fancy", http://www.frontline.in/the-nation/no-flight-of-fancy/article6541263.ece , 14 November 2014, accessed on 20 November 2014.
[ii] "N-capable Nirbhay missile successfully test-fired", http://www.business-standard.com/article/current-affairs/n-capable-nirbhay-missile-successfully-test-fired-114101800032_1.html , 18 October 2014, accessed on 21 October 2014.
[iii] No.1
[iv] No.1
[v] "Indian-made UAV To Become A Cruise Missile", http://www.defenceaviation.com/2007/10/indian-made-uav-to-become-a-cruise-missile.html, 5 October 2007, accessed on 21 November 2014.
[vi] "India Successfully tests Nirbhay cruise missile", http://www.janes.com/article/44688/india-successfully-tests-nirbhay-cruise-missile , 16 October 2014, accessed on 23 November 2014.
[vii] No.1