

19 years of Pokhran-II tests: Where does Indian nuclear Arsenal stand now

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It has been 19 years since India conducted its second nuclear test at Pokhran, Rajasthan. May 11 is now commemorated as National Technology Day for India's successful foray into nuclear weapons development.

Here is how the Indian nuclear weapons programme has travelled so far.

In 1998, India conducted Pokhran-II tests where five nuclear explosives were tested. The tests took place between May 11 and May 13. The first explosive was a fusion device while the rest four were fission devices. According to Armscontrol.org, as of January 2017, India had 100-120 nuclear warheads.

India has gone on to develop what is called a nuclear triad--nuclear strike capabilities from land, air, sea/undersea.

The Indian Army is in-charge of the land-based nuclear weapons. Launching platforms are both from launch vehicles and silos. The main nuclear weapons ballistic missiles are of the Agni family. Agni-I, Agni-II and Agni-III and Agni-VI have already been inducted. The Agni-V is in development/testing stages and has undergone at least four successful tests. It is expected to be inducted into full service soon. While Agni-VI Inter-Continental Ballistic Missile is in the pipeline.

Agni-I is a short-medium range missile with a range of 700-1250 km. Agni-II is the medium range ballistic missile with a range of 2,000-3,000 km. The intermediate range missiles are Agni-III and Agni-IV. Agni-III can strike targets at a distance of at least 3,000 km. Agni-IV has a range of 4,000 km. Agni V which is of the intermediate to intercontinental range can strike anywhere between 5,000 and 5,500 km.

Prithvi missiles are short-range tactical missiles that are equipped for use with all the three service forces. Prithvi 1 class is a surface-to-surface missile. It is a tactical missile and primary use is for striking targets on the battlefield. These missiles are to be upgraded to the more accurate Prahaar system. Prithvi II missile has a range of up to 250 km. The missile was developed keeping in mind the primary user--Indian Air Force. Though, it was later inducted by the Army as well. The upgraded missiles have an extended range of around 350 km.

Prithvi III can carry a half a ton warhead up to 600 km. If its warhead is replaced with a 250 kg one, the extended range of the Prithvi -III goes up to 750 km. A customised version of this system was made into Dhanush for sea-based attacks.

Air Force nuclear weapons prowess

Air-based deployment via Indian Air Force aircraft is still in a nascent stage. Jaguar and Mirage 2000 aircraft are modelled to have the capability to carry nuclear warheads. Guided attacks, however, may not be possible with these and the option would be free dropping bombs. The soon to be inducted Rafales will have the capability to deploy guided nuclear weapons.

Naval nuclear weapon strike capability

India is awaiting the induction of the four nuclear powered Arihant class submarines with capabilities of launching ballistic missiles. The first of the four, INS Arihant, has been launched. It is the crown of the Indian Naval nuclear program. The submarine will be equipped with Sagarika (K-15) class ballistic missiles. Sagarika missile system has submarine launch capability and can be launched through the vessel's torpedo hold. It has a range of around 700 km. It can carry a payload of half a ton and weighs seven tonnes itself. The missile was tested via an undersea pontoon. But for extensive testings, India may look to request assistance from the Russian Navy.

Another system available with the Navy is the Dhanush ballistic missile system. It is a variant of the Prithvi missile and can strike targets up to 300 km. This is a ship- based system.

India floats repeat tender for homemade rocket launchers valued at \$2B

New Delhi — In a move aimed at becoming more self-sufficient with multi-barrel rocket launchers, the Indian Ministry of Defence has floated a big-ticket bid to buy six regiments of homemade Pinaka multi-barrel rocket launchers for \$2 billion. The order for the acquisition is expected to be placed within 18 months.

Last December, the ministry placed an order for two regiments — one regiment is 18 systems — totaling a \$350 million order for the Pinaka rocket launchers. Industry sources say India is now contemplating exporting the Pinaka.

The order will be split between the prime state-owned contractors Bharat Earth Movers Limited and the Ordnance Factories Board, or OFB, and private sector defense companies Larsen & Toubro and Tata Power SED. Under the contract, BEML will supply the vehicles for the rocket launchers; L&T and Tata Power SED will supply the launcher systems; and OFB will supply the rocket ammunition .

L&T and Tata Power SED have designed and developed the Pinaka system with the Defence Research and Development Organization, or DRDO. The Indian Army currently operates two regiments of the Pinaka systems. "The indigenous rocket launcher system is required to meet Army's operational necessities and also to reduce dependence on foreign sources and replacing the Russian Grad BM-21 and Smerch rocket systems," an Indian Army official said. The Army needs the extended range Pinaka Mark-II at the earliest, the official added, "however, the latest order is for Pinaka Mark-I with a range of 30 kilometers even though the Indian Army had preferred Pinaka Mark-II, which has a range of up to 65 kilometers but is still under development."

Jayant Damodar Patil, head of defense and aerospace for L&T, said "Pinaka Mark-II is a developmental program of DRDO. The technical trials have been completed a couple of months back, but the induction decision is awaited."

"DRDO and Indian industry will now target to export Pinaka Mk-I," he said. However, some Army officials cited problems with the rockets of the two regiments that have been in use for more than a decade.

Bhupinder Yadav, a defense analyst and retired Indian Army major general, said there is a problem with the rocket ammunition supplied by OFB. "The production of Pinaka rockets is on hold after some quality-related issues mainly relating to OFB-produced propellant such as short ranges, residues after firings and accidents relating to burst in launchers, etc."

However, such defects occur if the propellant is non-homogeneous and have air bubbles, he asserted, adding that "the supplies of fuzes and its quality assurances is also an issue."

"Absorption of technology by OFB appears to be poor, and it (OFB) may not be able to maintain quality standards at the manufacturing stage, particularly for mass production," according to Rahul Bhonsle, a defense analyst and retired Indian Army brigadier.

No MoD official was available to comment on the problems with the rockets and their current status.

On the possibility of imports of rockets and ammunition for Pinaka, Patil said: "Rockets ammunition are expected to be ordered to OFB as well as the private industries that would take technology transfer from DRDO (which has developed the rocket ammunition)."

"No imports are likely as any imported ammunition will have to undergo detailed evaluation trials that can take years to get cleared," Patil added.