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Is India deliberately understating Agni-5's range?

By Vikas

Time and again International defence experts, especially the Chinese, have claimed that India has been understating the range of its intercontinental ballistic missile Agni-5. India initially did not divulge the exact range that the missile can strike but later DRDO hinted that it has the capability to reach 5,000 kms.

Chinese experts say that the missile actually has the potential to reach targets 8,000 kilometres away and that the Indian government had deliberately downplayed the missile's capability in order to avoid causing concern to other countries. Before delving further into the subject, one must understand why India could be deliberately understating its military capabilities. India is striving hard to gain into NSG and it may not go down well with the superpowers if it comes out in the open that India has an missile capable of carrying nuclear warheads to a distance of around 8,000 kms. It may hamper India's chance of gaining entry in the elite NSG group.

Let's compare Agni 5 with one of the most lethal solid propelled missiles in the world the Trident, developed by United Kingdom, and try to understand the things better.

The range of a missile is mainly determined by the amount of fuel it can carry, and the weight of its warheads. The fuel of a missile is determine mainly by its internal volume which is determined by its height and diameter, as well a weight. Like Agni, even Trident has 3 stages and propelled by solid fuel. Trident weighs 59 tons, is 13.5 meters long and has a diameter of 2.1 meters.

Agni 5 weighs 50 tons, is 17.5 meters long and has diameter of 2 meters. Agni 5 weighs less as its body and structure is entirely fabricated from lighter composite materials. Agni-5's diameter is less than Trident but is longer so it can be deduced that they carry more or less same amount of fuel. However, the official range of the Trident is 12,000 kms while the Agni V is '5000' kms. All this taken into consideration, it clear points that Agni 5 may be able to hit targets beyond its stated 5,000 kilometers range.

Agni-1

Agni-1 is a single-stage missile developed after the Kargil War to fill the gap between 250 km range of Prithvi-II and 2,500 km range of Agni-II. The Agni I has a range of 700-1250 km.

Agni- 2

The Agni-II is a medium-range ballistic missile (MRBM) with two solid fuel stages and a Post Boost Vehicle (PBV) integrated into the missile's Re-entry Vehicle (RV). Agni 2 has a range of 2,000 kms

Agni 3

Agni-III is an intermediate-range ballistic missile developed as the successor to Agni-II. It has a range of 3,500 km- 5,000 km, and is capable of engaging targets deep inside neighbouring countries.

Agni-4

Agni-IV is the fourth in the Agni series of missiles which was earlier known as Agni II prime. The missile is light-weight and has two stages of solid propulsion and a payload with re-entry heat shield. Agni 4's range is around 4000 kms.

US PE giant KKR to invest Rs 300 crore into India's oldest business group Walchand Nagar

Mumbai: US private-equity giant KKR & Co would invest Rs 300 crore in Walchand Nagar Industries, one of India's oldest business groups, in a structured-financing deal that would help the Mumbai-based conglomerate realign its businesses and repay some of its term loans.

The transaction, approved by KKR's investment committee, will be signed in the coming week, multiple sources with direct knowledge of the matter told ET.

The capital infusion would be yet another credit deal from the New York-based private equity giant that has demonstrated an aggressive credit strategy in India, where it has deployed around \$4 billion over the past seven years.

The deal will help WalchandBSE 0.83 % retire some of its bank loans, besides providing capital to drive growth. The funds would be mainly used for expansion of its defence business, as the group wants to strengthen its niche expertise, the sources said.

When contacted, KKR and Walchand declined to comment.

Structured Financing Deal

Walchand	KKR
<ul style="list-style-type: none"> ■ Founded in 1908 in Mumbai ■ Manufactures heavy engineering products and machinery ■ Supplies critical components to India's missile programmes, space missions ■ Works closely with DRDO, ISRO ■ Funds to be used to realign businesses, strengthen defence space 	<ul style="list-style-type: none"> ■ Invested approximately \$2.5 bn in 12 PE transactions since 2006 ■ Has extended close to \$4 billion of structured financing to business groups ■ Invested \$200 m from its special situations business ■ Pumped in \$900 m through its real estate lending business

Set up in 1908 by Walchand Hirachand Doshi, this Mumbai-based firm manufactures heavy engineering products and machinery, and provides EPC and turnkey project services. The company has strong presence in defence, aerospace, and nuclear industries. It supplies infrastructure and facilities for India's next-generation Akash Missile system and the Inter-Continental Ballistic Missile programmes, including the Agni and Prithvi missile systems.

The company was also a major core-component and systems supplier for India's Moon Mission, Chandrayaan. The company works closely with the Defence Research and Development Organisation (DRDO) and Indian Space Research Organisation, its Web site showed.

"The strategy is to realign the business and sharpening the focus on defence production. The partnership with KKR will also help the firm for its global exposure," one of the sources said. "For KKR, this would be the beginning of a long-term partnership with Walchand. Eventually, it will get into the board of the company and make follow-on investments as well," he added.

KKR has been one of the most aggressive private equity firms in India over the past several years. Although known for its multibillion buyout bets globally, the asset manager's India strategy has been predominantly into partnership deals and it has developed in India a niche structured-credit platform that KKR intends to replicate across Asia.

The US asset manager has invested approximately \$2.5 billion in 12 private equity transactions since 2006, and has extended close to \$4 billion of structured financing to business groups in India through its corporate credit business, besides investing approximately \$200 million from its special situations business and \$ 900 million through its real estate lending business. India plans to spend \$250 billion by 2025 on weapon-systems and equipment for modernization and strengthening of its armed forces, the country's Defence Minister said in March. Walchand, one of the original promoters of staterun Hindustan Aeronautics Ltd, is eyeing a large chunk in this gigantic pie of defence orders.



Tue, 09 May, 2017

Push for private sector in defence production

By Dinakar Peri

Centre moots tie-up with global firms

The Government has accelerated efforts to finalise the ambitious Strategic Partnership (SP) model, which would give a major boost to private sector participation in defence manufacturing.

Guidelines on the anvil

As part of the stepped up efforts, the Defence Ministry has scheduled consultations with the industry to get their feedback in the next couple of days.

The policy, which is part of the Defence Procurement Procedure (DPP) 2016, will set out guidelines on how major Indian private sector companies can tie up with global Original Equipment Manufacturers in critical military systems and platforms.

Officials said several consultations had been held over the last month. Arun Jaitley, after he took additional charge of the Defence Ministry, was briefed on it and he was keen to approve it at the earliest.

“It could unlock some of the big projects that are stalled, including the new line of submarines and single engine fighter aircraft. It should be out in the next two months,” a defence official told *The Hindu*.

An interaction between the defence ministry and industry representatives was scheduled for May 11. It would be attended by Mr. Jaitley and Defence Secretary G. Mohan Kumar. Major industry bodies and Indian private sector companies which would take the lead in the SP model had been invited. The final clearance would be accorded by the Defence Acquisition Council (DAC) and the meetings had been slotted.



Tue, 09 May, 2017

Three services are split on forming joint theatre commands

By Sushant Singh

The Army is in favour of the proposal, while the Air Force is strongly opposed to it. While the Navy's view is more nuanced, it too is not in favour of implementing the proposal currently.

While the chiefs of the three defence services appeared together to issue the Joint Doctrine last month, the three forces disagree on the proposal to create integrated theatre commands. The Army is in favour of the

proposal, while the Air Force is strongly opposed to it. While the Navy's view is more nuanced, it too is not in favour of implementing the proposal currently.

Following the recommendations of the expert committee headed by Lt General D B Shekatkar (ret'd), which submitted its report to then Defence Minister Manohar Parrikar in January, the Ministry of Defence (MoD) has sought the views of the three service chiefs by the end of the month.

According to MoD sources, the proposal is to create three integrated theatre commands: northern command for the China border, western command for the Pakistan border and southern command for the maritime borders. As the borders with Pakistan and China are land-centric, it is expected that the northern and western commands would have to be headed by an Army General. The southern command would have to be headed by a Navy Admiral.

The Army's rationale for integrated theatre commands is based on the need to have a unified direction and control of war. This was put forth by the Army during deliberations on the proposal at the combined commanders conference, chaired by the Prime Minister, at Dehradun in February. According to an official who attended the conference, Eastern Army Commander Lt General Praveen Bakshi remarked that while the opposing side in China has a single command, the Indian side has seven commands of the Army and Air Force for the same task.

"Why should we have 17 military commands in the country? We need combat efficiency and economy of resources. With a single commander, you can have all the military assets under him. For eg, on the Pakistan border, there are at least three Army commands and two Air Force commands. We should ideally have one integrated command, as all modern militaries have, such as the United States or even China," a senior Army officer told The Indian Express.

But the Air Force contends that foreign examples are not applicable to the Indian situation. "The US has global roles where it can't move assets from one theatre to another. We have no such problems of distance and time. The Chinese have the theatre commands because Xi Jinping wanted to reduce the power of the PLA (Chinese military)," said a top Air Force officer.

According to the Air Force, India should be considered as a single theatre where resources can be easily moved between various areas as required. "With only 34 fighter squadrons instead of 45, do we have the luxury of allocating them to individual commands. When we have 60 squadrons, we can do that. Also, we have three AWACS and six mid-air refuellers. How does one distribute them? Do we even need to, unless the country is willing to spend even more to buy these platforms," said the Air Force officer.

The Navy's position on the matter is more nuanced. "While there is a need for greater jointness among the three services, it is not appropriate to move to integrated theatre commands anytime soon. The Navy has a much wider maritime role across the seas, where a lot of coordination between various commands is done by the Naval headquarters. If these individual commands go under different theatre commanders, these assets will not be available practically," a Navy officer explained.

"There is a myth about common assets between the three services. The helicopters and the UAVs are used by all the three services. But while the Army wants these helicopters to fly at Siachen, we want them to fly at sea level. How are they the same," the officer said.

The diversity of views means that it will require the ministry and the government to take the lead. But, adding to the uncertainty is the fact that Defence Secretary G Mohan Kumar is scheduled to retire later this month and there is no clarity on the appointment of a full-time Defence Minister. Finance Minister Arun Jaitley currently has additional charge of the MoD.

Maoists forge ‘rocket-powered’ resurgence to take on forces

One Step Ahead: The more we learn their tactics, the more they learn ours, says CRPF

One night this February, six rockets whooshed out of the forest and burst into flames, raining shrapnel into trees surrounding a police camp in Chhattisgarh. No lives were lost but the explosions sounded a loud alarm for the security forces fighting a decades-old Maoist insurgency.

Until recently, the Central Reserve Police Force (CRPF) cleared all the trees and shrubs before pitching their camps in the forests where the rebels hold sway. But now the trees are left to stand as a shield against projectiles the insurgents seem to fire with worrying frequency.

Security specialists say the Maoists are adapting themselves to the changing ground situation. With the region teeming with 118 paramilitary battalions comprising 120,000 troops, they are taking to the aerial route to attack.

“The more we learn their tactics, the more they learn our tactics,” said a senior CRPF officer involved in anti-Maoist operations. “As we improve, so do they.”

The Maoists’ crude rockets and mortars were on show even during the ambush in Sukma two weeks ago that killed 25 CRPF men. The guerrillas used five kinds of airborne projectiles in the ambush, officials said.

One of the projectiles seized from the spot was what security forces describe as the “Rambo arrow”. Fired from a traditional bow, the arrowhead carried lowgrade gunpowder that explodes on impact after hitting a target.

“Rambo arrows don’t cause much damage but they disorient you in the fog of war,” said a CoBRA trooper who survived the ambush. The CoBRA is a commando unit that specialises in guerrilla warfare.

Intelligence officials who studied the ambush said the projectiles were used to force troopers to abandon cover positions and come into the open, where they were picked off with gunfire.

The crude artillery bear testimony to the Maoists’ changing tactics under pressure from the swelling number of security forces. Their area of influence has shrunk over the years and mounting ambushes are becoming difficult, though not entirely rare. Triggering improvised explosive devices (IEDs) is also becoming a challenge.

“We have been recovering IEDs of increasing sophistication,” Jamal Khan, the principal of CRPF’s Institute of IED Management at Pune told HT. “As we have grown better at identifying and defusing IEDs, the Maoists have been forced to adapt”.

The CRPF has been in Chhattisgarh since 2003, but troopers began venturing into the forests in 2009-10 during Operation Green Hunt. “As forces increased and training improved, the Maoists started to rely more on IEDs and less on ambushes,” said a senior CRPF officer, who served at the time in Dantewada, a small town in the conflict zone.

In 2012, the CRPF set up the IED institute to combat this threat. That year, the force identified and defused 587 IEDs, which rose to 1072 IEDs in 2016. As the forces grew more adept at finding IEDs, the guerrillas changed tack. The Maoist rocket was first seen in a 2012 attack on a paramilitary camp in Narayanpur.

“That version was very crude and didn’t fly very well,” said Khan. But since 2015, the Maoists have fired rockets on CRPF camps four times.

The newer versions are more sophisticated: A conical nose filled with explosives is welded into a tail-section filled with lowexplosive propellant fuel. A funnel-shaped nozzle on the tail produces thrust and “fins” loosely screwed to the tail provide stability to the rockets in flight and increase their chances of landing on the nose. Once they strike, a spring-loaded nail strikes a detonator and triggers an explosion.

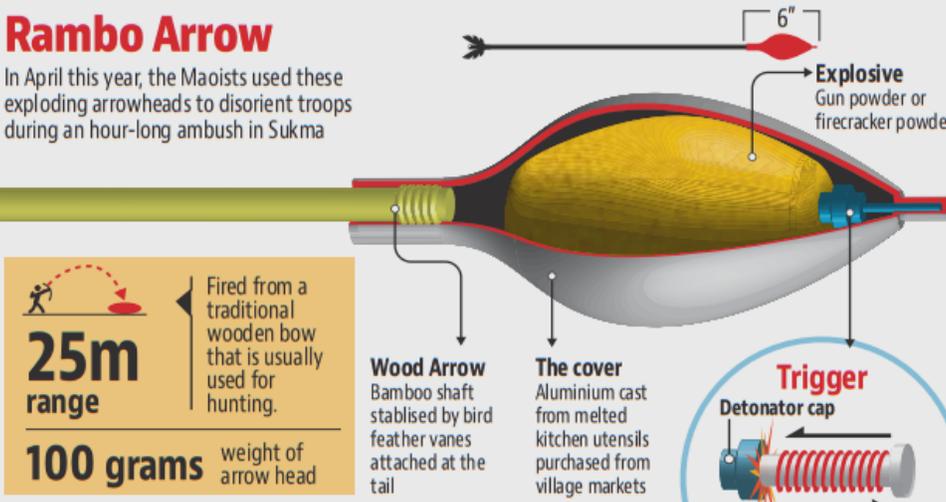
Maoist-made rockets

Since 2015, the Communist Party of India (Maoist) has greatly improved their weaponry. The new arsenal relies heavily on airborne projectiles like exploding arrows, mortars and rudimentary rockets.



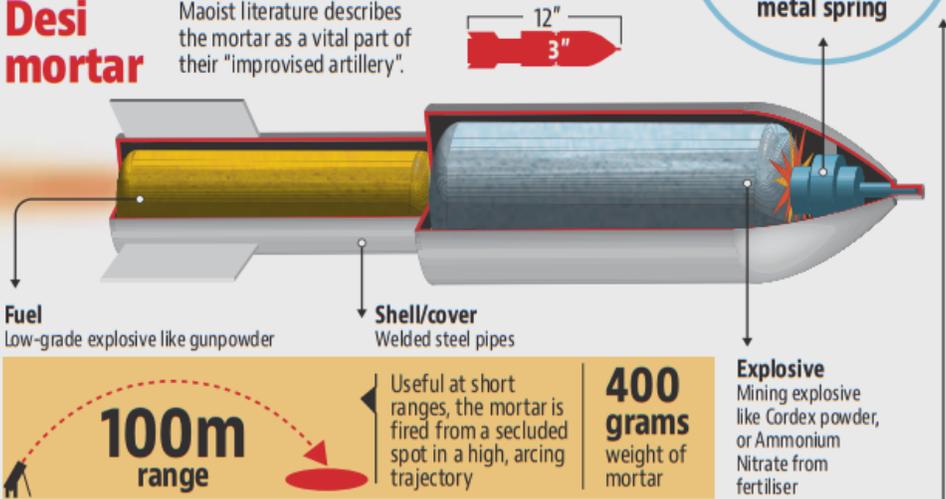
Rambo Arrow

In April this year, the Maoists used these exploding arrowheads to disorient troops during an hour-long ambush in Sukma



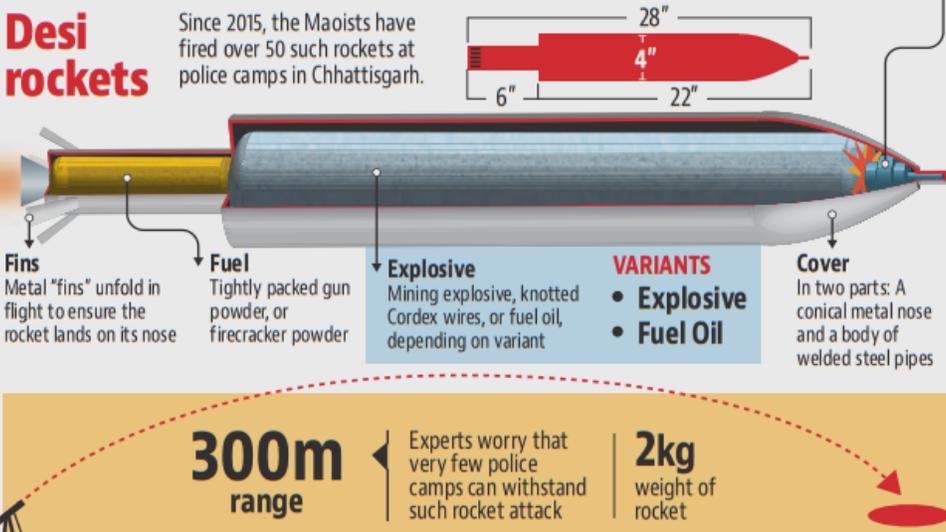
Desi mortar

Maoist literature describes the mortar as a vital part of their "improvised artillery".



Desi rockets

Since 2015, the Maoists have fired over 50 such rockets at police camps in Chhattisgarh.



Graphic: MUKESH SHARMA

The rockets have rattled security forces, though they have not resulted in deaths yet. One worry is that the Maoists seem to have retained their technically skilled cadre despite the surrender and capture of many high-profile leaders over the past few years.

“What is left is the real hardcore, the real experienced fighters,” said an officer who recently confronted a Maoist military company.

“Right now they are going from village to village, showing the weapons they looted, saying – We have bounced back.”



Tue, 09 May, 2017

A smart timekeeper with all the moves

The watch face has the ability to move in 5 different directions for various alerts

Scientists have developed a new smartwatch with a display that moves in five different directions — dramatically improving functionality and addressing limitations of today’s fixed-face watches.

The watch, named Cito, has the ability to rotate, hinge, translate, rise and orbit.

Disabled-friendly

The technology can provide important benefits to wearers with physical disabilities or other impairments, researchers said. “Users want smartwatches that fit their lifestyles and needs,” said Xing-Dong Yang, Assistant Professor at Dartmouth College in the U.S.

“The Cito prototype is an exciting innovation that could give consumers even more great reasons to wear smartwatches,” said Mr. Yang.

Most smartwatch research primarily addresses how users can more easily input information. Cito aims to remove awkward moments associated with using smartwatches by improving how the device presents data to the wearer.

Examples of watch movement include automatically orbiting around the wristband to allow viewing when the wrist is facing away from the user; rising to alert the wearer of a notification if the user is playing a game; hinging to allow a companion to view the watch face; and translating to reveal the watch face from underneath a shirt sleeve.

Functional and fun

“Consumers will question the need for smartwatches if the devices are just not convenient enough. Cito proves the true potential of smartwatches and shows that they can be functional and fun,” said Mr. Yang.

The five watch face movements can be performed independently or combined.