ISSUE BRIEF

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HYPERSONIC MISSILE RACE: IMPLICATIONS FOR REGIONAL AND GLOBAL SECURITY

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India tested the High-Speed Technology Demonstrator Vehicle (HSTDV) using an indigenously developed propulsion system on September 7, 2020. It, thus, became the fourth country to develop such technology.

US, Russia and China are already well on the way to develop these missiles. It is important to look into this advanced missile technology to determine what are the characteristics of these weapons, and what they mean for nuclear deterrence. Would these weapons fuel yet more arms races regionally and globally? Most important of all, what does India's development of hypersonic missiles mean for Pakistan and security in the region.

Overall, hypersonic missiles have a number of characteristics. They can achieve great speed. In order to qualify as hypersonic, a missile has to achieve at least a speed five times that of sound i.e. Mach 5. That is 4000 miles per hour. There are weapons that can travel for upto 20 mach. Hypersonic missiles are highly maneuverable and can have long ranges. Due to high speed and maneuverability they can penetrate missile defense systems. What makes hypersonic missiles lethal is not just their speed, but their ability to maneuver once launched. US and Russia have had hypersonic missiles for years but those could not be maneuvered once launched. What is new is the ability for these missiles to change course after the initial launch as well. There are three kinds of hypersonic missiles – the guided ballistic missile, boost guide missiles and hypersonic cruise missiles.

Russia is developing the 'Avangard' intercontinental ballistic missile system which uses a hypersonic boost-glide vehicle, with the ability to travel at speed 20 times that of sound. Russia also has 'Kinzhal' which is a guided cruise missile with a range of 1200 km and a speed of Mach 10. It is

capable of carrying nuclear and conventional warheads. Russia announced deployment of 'Avangard' on December 2019.[1] Russia is also developing 'Tsirkon', which is a ship-launched hypersonic cruise missile capable of targeting on ground and at sea at speeds of Mach 6-8.[2] Russia accelerated work on its hypersonic missiles once the US withdrew from the Anti-Ballistic Missiles Treaty and ignored Russian concerns over the deployment of missile defense systems.

China also has several hypersonic missiles. China has DF-ZF hypersonic glide vehicle that can be deployed on top of DF-17 with a speed of Mach 10. China unveiled its DF-17 hypersonic missile on its National Day parade in October 2019.China is also developing air-launched CH-AS-X-13 missile with Mach 10 speed and a 1500km range. In August 2018, China also tested Starry Sky-2 which is a hypersonic vehicle prototype capable of carrying nuclear warheads.[3] China's pursuit of hypersonic missiles is also fueled by fear of US hypersonic missiles that can potentially conduct a first strike while US missile defenses could defeat a retaliatory strike by China.

The US has also developed a number of hypersonic missiles. It has hypersonic missiles which are mostly meant for conventional use. The US Navy has Conventional Prompt Strike (CPS), the Army has Long-Range Hypersonic Weapon (LRHW) and the Air Force has AGM-183 Air-Launched Rapid Response Weapon (ARRW). It also has the Tactical Boost Glide (TBG) and the Hypersonic Air-breathing Weapon Concept (HAWC) and the HyRAX unmanned craft projects.[4] The US claims that these weapons are aimed at neutralizing Russian and Chinese significant hypersonic missile developments. Thus, a hypersonic missile race is already well on its way.

India has now joined the race to develop hypersonic missile technology.It first unsuccessfully tested HSTDV in June 2019. However, the September 2020 test was reportedly a success. It was powered by a scramjet engine and has a speed of Mach 6.[5] DRDO is also working on a hypersonic cruise missile BrahMos-II with the help of Russia. It is also expected to attain Mach 6 speed using hypersonic scramjet technology. Although India may be five to six years away from developing hypersonic missiles, it has a number of implications at the regional and global level.

1 "Russia deploys Avangard hypersonic missile system," *BBC News*, December 27, 2019, https://www.bbc.com/news/world-europe-50927648

2 "Hypersonic Weapons: Background and Issues for Congress," CRS Repot R45811, August 27, 2020, https://fas.org/sgp/crs/weapons/R45811.pdf

3 Ibid.

4 Ibid.

5 "India successfully test scramjet technology for hypersonic missile," *Times of India*, September 8, 2020, https://timesofindia.indiatimes.com/india/india-successfully-test-scramjet-technology-for-hypersonic-missiles/articleshow/77973889.cms

The race to develop and master hypersonic missiles is destabilizing in many ways. It is not only destabilizing at the global level but also at the regional level now that India is also pursuing this technology. This new arms race would change nuclear deterrence calculations. A country that has hypersonic missiles would enjoy an edge over a country that does not. It would increase first strike tendencies in the possessor state with the confidence that it can strike its adversary and absorb a counter strike through missile defense. This scenario would be relevant in the case of India and Pakistan whereby it would further erode nuclear deterrence between the two and create first strike temptations on the part of New Delhi. With short missile flight times in South Asia - 5-10 minutes - hypersonic missiles would further shorten this time considerably, making the India-Pakistan nuclear theatre even more unstable. Hypersonic missiles would provide India considerable edge in the South Asian nuclear deterrence equation. It will, thus, create new challenges for Pakistan's security.

At the hypersonic level, it would likely be a matter of a minute or two for India to initiate the first strike in absence of a credible countermeasure. These geographical circumstances would likely provide India an edge vis-à-vis Pakistan thus becoming a considerable challenge.

The hypersonic missiles development is also destabilizing at the global level. This will also affect strategic calculations among the great powers like US, Russia and China and undermine nuclear deterrence. Russia and China have already made it apparent that their hypersonic missile development is a hedge against US missile defenses. The technology would further fuel an arms race leading great powers to possibly go for development of hypersonic anti-missile systems and other technologies to defeat adversaries' missiles. Another destabilizing factor is the deployment of conventional hypersonic missiles which may lead to the failure of the adversary to distinguish between a conventional or nuclear warhead.[6] This may lead to unauthorized or accidental nuclear launch.

A hypersonic missile race is already on its way between US, Russia, China and now India. These missiles would further deepen an arms race and bring instability at the global and regional level. Development of hypersonic missiles by India further undermines nuclear deterrence with Pakistan and increases chances of conflict in South Asia. Hypersonic missiles would further enhance India's offensive counterforce capabilities against Pakistan. For Pakistan, this would necessitate an assessment of the threat from India and possible countermeasures. At the global level as well, the move away from arms control arrangement and the onset of a new arms race bodes ill for peace and security. Great powers also need to take practical measures to avoid arms races. Afterall,

[6] By Andrew W. Reddie, "Hypersonic missiles: Why the new "arms race" is going nowhere fast," Bulletin of Atomic Scientists, January 13, 2020, https://thebulletin.org/2020/01/hypersonic-missiles-new-arms-race-going-nowhere-fast/

accumulation of weapons and new technologies by all major powers ends up making them less secure.