Indian Quest for Hypersonic Missiles in South Asia and Disruption of Strategic Stability in the Indo-Pak Dyad

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Abstract

The novelty associated with hypersonic weapons - which covers their extraordinary attributes like speed, maneuverability, dual-use capability, and absence of an effective defense - has convinced all the major powers to acquire them. While acquisition of hypersonic weapons by the United States, Russia and China may be justified, keeping in view their intertwined power dynamics and desire for defence, India's pursuit of hypersonic missiles is merely for prestige as it certainly does not face any offense from Pakistan. To counter China's fear, which is often projected as a key threat to their security, the current specifications of Indian hypersonic missiles do not make them compatible in any way. Nevertheless, Indian hypersonic weapons come at a great cost for the stability of crisis resolution, deterrence, and arms race stability in the region. All this is done just to enhance India's stature and put it in the same league as the major global powers. Concurrently, the Hindutva-driven fascist ideology of India, being superior to the rest is feeding this quest for exceptional technologies with a complete disregard for international norms and regional stability. On the contrary, Pakistan continues to adhere to the tenets of Full Spectrum Deterrence under the overhang of the concept of Credible Minimum Deterrence and continues to invest only in defensive technologies which fulfill the requirements to ensure credible deterrence. This paper discusses the trends of hypersonic weapons acquisition by the US, Russia, China, and Iran -- as these

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countries are seen to form the crux of the nuclear domino effect. The paper presents a special focus on the Indian pursuit of these weapons, their strategic implications for the strategic stability in the region, and the response options available to Pakistan.

Keywords: Hypersonic Weapons (HSW), HSTDV, BrahMos II, Deterrence Instability, Arms Race Instability, Crisis Instability

Introduction

Carl Von Clausewitz proposed the idea of achieving the maximum military gains despite limited resources – both military and political.[1] Similarly, Sun Tzu proposed the idea of 'winning without fighting'[2] – an end that may be achieved either through political tactics alone or by possessing such weapons which prevent an adversary from initiating any aggression. One of the new entrants in the inventory of nuclear weapon possessor states is hypersonic weapons (HSWs). They tend to fulfill both these purposes for the possessor state as philosophised by Clausewitz and Sun Tzu.[3] These weapons do so by allowing a state the option to credibly deter an adversary from using its nuclear weapons. Similarly, the HSWs can also help in coercing an adversarial state into making concessions beneficial for the possessor state. Hence, if employed tactfully, these weapons, due to their distinct capabilities, which will be discussed in detail in the following paragraphs, can allow the possessor state to essentially win any conflict without actually fighting it. In the proceeding paragraphs, this paper attempts to deconstruct the dynamics surrounding hypersonic weapons, their attributes, the associated novelty, and the evident ongoing race among major powers to perfect the HSW technology to enhance their respective arsenals. This will be followed by an assessment of the impact of HSWs on strategic stability with a special focus on the acquisition of these weapons by India and the consequences for regional stability.

For a layperson, using the definition given by Merriam-Webster, hypersonic relates to a "speed five or more times that of sound in the air,"[4]

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[1] Patrick J. Garrity, "The Parameters of Victory," *Claremont Review of Books*, August 15, 2012, accessed October 10, 2022, https://claremontreviewofbooks.com/digital/the-parameters-of-victory/.

[2] John F. Sullivan, "Sun Tzu's Fighting Words," *The Strategy Bridge*, June 15, 2020, accessed June 18, 2023, https://thestrategybridge.org/the-bridge/2020/6/15/sun-tzus-fighting-words.

[3] Alan Cummings, "Hypersonic Weapons: Tactical Uses and Strategic Goals," *War on the Rocks*, November 12, 2019, https://warontherocks.com/2019/11/hypersonic-weapons-tactical-uses-and-strategic-goals/.

[4] *Merriam-Webster Online*, "Hypersonic Definition," accessed October 12, 2022, https://www.merriam-webster.com/dictionary/hypersonic.

and is represented as Mach 5. In aerodynamics – the ach number is used to identify an object's speed in relation to the speed of sound. Hypersonic missiles may not be categorised as a new technology *per se*, as most ballistic missiles can travel at hypersonic speeds. Concurrently, cruise missiles can fly at both subsonic (< Mach 1) and supersonic (Mach 1-5) speeds.[5] The United States' nuclear-armed intercontinental ballistic missile (ICBM) Minuteman III can reach the levels of Mach 23 at burnout, and has the capability to take just 30 minutes to reach the Russian mainland after taking off from its silo housed in the western US.[6]

What makes "hypersonic weapons" novel is their practical ability to fly at a trajectory which falls lower than that of an ICBM and higher than the path followed by traditional cruise missiles (See Figure 1). Moreover, due to this distinction, they are primarily intended to be used in a regional theatre instead of intercontinental use.[7]

[5] Shannon Bugos and Kingston Reif, "Understanding Hypersonic Weapons: Managing the Allure and the Risks," *Arms Control Association* (2021): 4. https://www.armscontrol.org/sites/default/files/files/Reports/ACA_Report_HypersonicWeapons_2021.pdf, accessed on February 5, 2023.

[6] Shannon Bugos and Kingston Reif, "Understanding Hypersonic Weapons: Managing the Allure and the Risks.

[7] Shannon Bugos and Kingston Reif, "Understanding Hypersonic Weapons: Managing the Allure and the Risks.

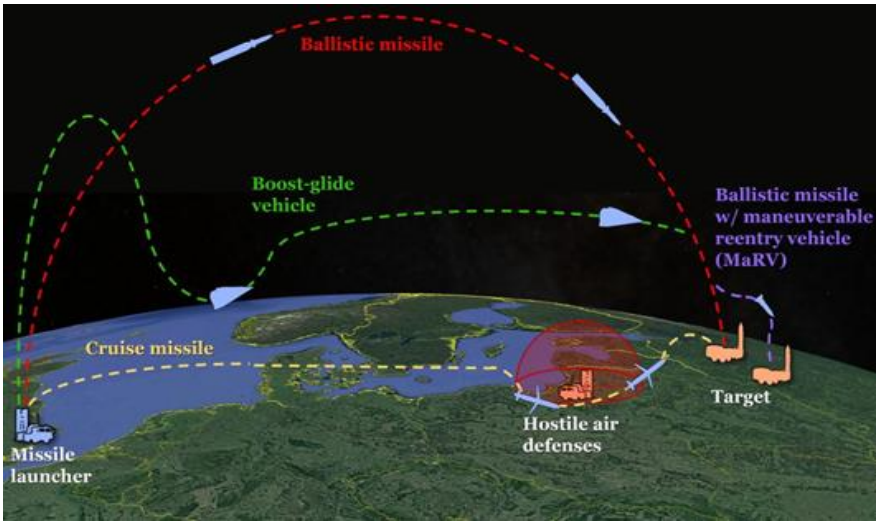

Figure 1. *Notional flight paths of the hypersonic boost-glide missiles, ballistic missiles, and cruise missile*[8]

Types of Hypersonic Missiles

Presently, hypersonic missiles can be divided into two categories: hypersonic glide vehicles (HGVs) and hypersonic cruise missiles (HCMs). HGVs can cover a distance of 1 mile per second and travel at the speed of at least Mach 5. They fly at lower altitudes compared to ballistic missiles and glide towards the target after being launched through a rocket. A main feature of the HGVs is their maneuverability. This characteristic differentiates the HGVs from ballistic reentry vehicles i.e., those that travel on a ballistic trajectory throughout their flight. Furthermore, it is also assumed that in contrast to a standard ballistic missile trajectory, the HGV boosters may be launched along a depressed trajectory and consequently release their glider at a lower altitude, thereby defeating the enemy's air defences (See Figure 2). This, however, is not necessary in all cases.[9]

[8] Zohuri, Bahman & Mcdaniel, Patrick & Lee, Jim & Rodgers, Casey, "New Weapon of To morrow's Battlefield Driven by Hypersonic Velocity," *Journal of Energy and Power Engi neering* 13 (2019): 177-196.

[9] K. M Sayler, *Defense Primer: Hypersonic Boost-Glide Weapons* (D.C: Congressional Res earch Service, 2020).

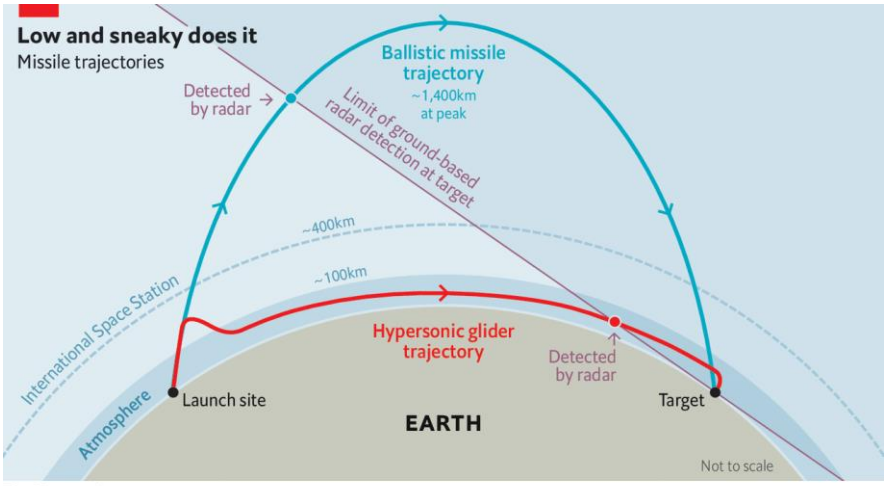

Figure 2. *Terrestrial-Based Detection of Ballistic Missiles vs. Hypersonic Glide Vehicles*[10]

Concurrently, the HCMs possess a capability to fly at a higher altitude than traditional cruise missiles and can reach greater speeds than their traditional counterparts too. Furthermore, they are powered by high-speed engines, called scramjets[11] – which are a supersonic combustion ramjet engine. As compared to hypersonic gliders, scramjets are technically difficult to develop resulting in the former to be completed first.[12]

Both types of hypersonic missiles are designed to carry both conventional and nuclear payloads. The energy that the conventional variants derive from their high speed may be used to effectively destroy these missiles' intended targets on impact. It is a combination of speed, maneuverability,

[10] "Gliding missiles that fly faster than Mach 5 are coming," *The Economist*, April 6, 2019, accessed December 12, 2022, https://www.economist.com/science-and-technology/2019/04/06/gliding-missiles-that-flyfaster-than-mach-5-are-coming.
[11] Kelley M. Sayler, *Hypersonic Weapons: Background and Issues for Congress* (D.C: Congressional Research Service, 2021).
[12] "Hypersonic Cruise Missile," *Global Security*, October 20, 2022, accessed November 12, 2022, https://www.globalsecurity.org/military/world/rok/hcm.htm.

and accuracy.[13] This explains the growing attention towards these missiles and their development in recent years. This was also recognised by former US Acting Secretary of the Navy Thomas Modly, who argued that "the nature of the battle space" has been changed by HSWs, and they "can destabilise the global security environment and pose an existential threat" to the US.[14]

Trends of Acquisition

Boost-glide technology has been researched since 1930s; however, the programme gained momentum in the early 2000s. Currently, US, Russia and China pursue an active HGV acquisition program with several successful flight tests under their belts. There are a few other states, including India, which are also actively pursuing this technology.[15] The paragraphs below give a primer on the existing capabilities possessed by the US, Russia and China. Subsequently, India's ambitions and acquisitions are also discussed followed by the grave threats posed to regional security and beyond.

United States

The need for investment in hypersonic technology by the US arose from its desire to be able to hit targets inside enemy territory without having to rely on forward bases. This is due to an ongoing active effort to reduce the force numbers overseas. This restructuring also stems from the growing realisation within the US that due to the evolving nature of warfare in the 21st Century, it may not be able to ascertain whether the existing bases

[13] Ron Harper, "Army Hypersonic Weapons Demonstrating Super Accuracy," *National Defense Magazine*, October 13, 2020, accessed December 5, 2022, https://www.nationaldefensemagazine.org/articles/2020/10/13/ausanews-army-hypersonic-weapons-demonstrating-super-accuracy.

[14] K. M Sayler, *Defense Primer: Hypersonic Boost-Glide Weapons* (D.C: Congressional Research Service, 2020).

[15] "Hypersonic Weapons: A Challenge and Opportunity for Strategic Arms Control, United Nations," *United Nations Office for Disarmament Affair*, February 2019, accessed on December 6, 2022, https://www.un.org/disarmament/wp-content/uploads/2019/02/hypersonic-weapons-study.pdf.

would be close enough to the epi-centre of any future conflict.[16] This has resulted in the emergence of numerous proposals to enhance the US long-strike capability.[17] The benefits of such technologies are numerous, as identified. Firstly, these weapons would reduce the utility of forward bases, thereby cutting down the resources being expended to maintain these bases. Secondly, the US will no longer be handicapped in reaching targets deep inside enemy territory. Thirdly, long-range strike capability utilising ballistic missile technology provides an effective edge in circumventing and degrading the adversary's air defences if launched early on in a conflict.[18] The fourth benefit entails these weapons prospects to be used as strategic non-nuclear weapons whereby US can employ them against adversaries like China without breaking the nuclear threshold. The notion of strategic non-nuclear weapons, coupled with hypersonic speeds entail a "compressed battle space," which may allow the US to launch disarming conventional attacks against China without any prior warning.[19]

The 2001 US Quadrennial Defence Review (QDR) highlighted the need for long-range strike weapons by noting that US defence strategy "rests on the assumption that the US forces have the ability to project power worldwide."[20] In addition to their utility in helping US project its power globally, the 2006 QDR pointed out another purpose which these weapons may serve by stating that the prompt global strike capabilities can be used to "attack fixed, hard and deeply buried, mobile and relocatable targets

[16] "Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues," *Congressional Research Service*, July 16, 2021, accessed August 11, 2022https://sgp.fas.org/crs/nuke/R41464.pdf.
[17] Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues, 3.
[18] Conventional Prompt Global Strike and Long-Range Ballistic Missiles: Background and Issues, 3.
[19] Fabian Hoffmann, "Strategic Non-Nuclear Weapons and Strategic Stability - Promoting Trust Through Technical Understanding," *Foundation Pour La Recherché Strategique*, November 2021, accessed on February 26, 2023, https://www.frstrategie.org/sites/default/files/documents/programmes/Programme%20TNP%20-%20P5/2021/202103.pdf.
[20] *Quadrennial Defense Review Report* (D.C: U.S. Department of Defense, September 29,2001), 2, http://www.comw.org/qdr/qdr2001.pdf.

with improved accuracy anywhere in the world promptly."[21] In the 2018 US National Defense Strategy, hypersonic weapons were identified as one of the primary technologies with the ability to ensure that the US "will be able to fight and win the wars of the future." [22]

With these propositions as a baseline, the US focused its efforts on the development of HGVs and HCMs. Modifications are also being made to introduce shorter and intermediate range versions which may be deployed in regional conflicts. The development of hypersonic weapons was accelerated under the John S. McCain National Defense Authorisation Act for Fiscal Year 2019 (FY2019 NDAA, P.L. 115- 232), after USD (R&E) identified the program as a top priority research and development area.[23] Presently, hypersonic weapons are being developed under the US Navy's Conventional Prompt Strike program, and several Air Force, Army and DARPA programs by the Department of Defense (DOD).[24]

Russia

Russia's HSWs are being developed to evade US missile defence systems.[25] President Vladimir Putin has noted that these systems are aimed at "neutralis(ing) the threats posed by the deployment of the US global missile defense system." He further remarked in 2020 that, "the US withdrawal from the Anti-Ballistic Missile Treaty in 2002 forced Russia to start designing hypersonic weapons."[26]

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[21] *Quadrennial Defense Review Report* (D.C: U.S. Department of Defense, February 6, 200 6), 49-50, http://www.globalsecurity.org/military/library/policy/dod/qdr-2006-report.pdf.

[22] *Summary of the 2018 National Defense Strategy of The United States of America* (D.C: D epartment of Defense, 2018), 3, at https://dod.defense.gov/Portals/1/Documents/pubs/201 8-National-Defense-Strategy-Summary.pdf.

[23] *Hypersonic Weapons: Background and Issues for Congress*, (D.C: Congressional Researc h Service February 13, 2023), https://sgp.fas.org/crs/weapons/R45811.pdf.

[24] Hypersonic Weapons: Background and Issues for Congress, 4.

[25] Shannon Bugos and Kingston Reif, *Understanding Hypersonic Weapons: Managing the Allure and the Risks* (D.C: An Arms Control Association Report, September 2021), 12, https://www.armscontrol.org/sites/default/files/files/Reports/ACA_Report_HypersonicWe apons_2021.pdf.

[26] Shannon Bugos and Kingston Reif, Understanding Hypersonic Weapons: Managing the Allure and the Risks.

Russia, however, has pursued an effective HGV capability since the 1980s with Yu-70 HGV being the first system of its kind developed by the country – thereby making Russia the frontrunner in the race of HSW acquisition. Russian Avangard consists of an HGV, sometimes referred to as Yu-71, deployed on an ICBM. The Yu-71 is reportedly a successor of the Yu-70 HGV. Avangard – with an estimated range of 10,000km.[27] It has been tested through the period from 2011 till 2019 with a mixture of successes and failures.[28] However, President Putin highlighted successful tests of the Avangard and further confirmed that these systems – capable of lateral and vertical maneuverability at speeds in excess of Mach 20 – will be inducted in all the Russian Strategic Missile Forces "in the near future."[29] Russia has also followed the US suit and is now developing hypersonic weapons to be used in regional theatre. This class of missiles includes the Kinzhal ("Dagger") – a hypersonic air-launched ballistic missile (ALBM) – which has been fielded; and Tsirkon (or Zircon) – a hypersonic sea-launched cruise missile (SLCM) – which is under development. [30]

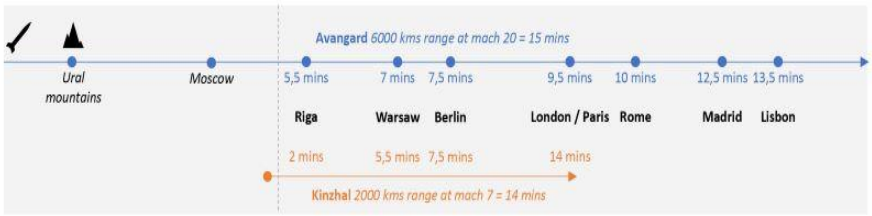

Figure 3. *Flight time of Avangard and Kinzhal missiles.*[31]

[27] Rahul Udoshi and Akshara Parkala, "Prompt strike: ground-launched hypersonics move a gainst missile defences," *Jane's International Defence Review,* June 21, 2018.
[28] Pavel Podvig, "Avangard System Is Tested, Said to Be Fully Ready for Deployment," *Ru ssian Strategic Nuclear Forces* (blog), December 26, 2018, http://russianforces.org/blog/ 2018/12/avangard_system_is_ tested_said.shtml.
[29] President of Russia, "Presidential Address to the Federal Assembly," March 1, 2018, http: //en.kremlin.ru/events/president/news/56957.
[30] Shannon Bugos and Kingston, *Understanding Hypersonic Weapons…* 13.
[31] Sander Ruben Aarten, "The impact of hypersonic missiles on strategic stability: Russia, C hina and the U.S.," *Militaire Spectator* 189 no. 4, (2020): 187, https://www.militairespect ator.nl/thema/strategie/artikel/impact-hypersonic-missiles-strategic-stability.

China

In congruence with the secrecy surrounding China's nuclear forces, information regarding the country's development of hypersonic missiles is also not publicly disclosed. However, of the little information that is in fact available, it can be ascertained that similar to Russia, China's pursuit of these weapons is also driven by its desire to be able to counteract US missile defences, and to overpower the latter's offensive capabilities in case of a conflict in Asia.[32] From 2014-2017, nine flight tests of China's DF-ZF HGV have been conducted with six termed 'broadly successful' by outside observers. The HGV reportedly attained speeds up to Mach 10 and covered distances between 1250 and 2100 km. Analysts have opined that the DF-ZF HGV will be eventually used with Chinese DF-31 ICBM. However, the question regarding which warhead the DF-ZF will carry remains unanswered.[33] Another nuclear-capable hypersonic missile prototype Xing Kong-2 or "Starry Sky-2" is under-development.[34] This missile has the ability to derive lift from the shockwaves generated as a result of its own hypersonic flight – hence being called "Wave-rider." Reportedly successful flight testing of the Xing Kong-2 was conducted in 2018.[35]

[32] Shannon Bugos and Kingston Reif, *Understanding Hypersonic Weapons: Managing the Allure and the Risks* (D.C: Arms Control Association, 20121), 13.
[33] Hypersonic Weapons: A Challenge and Opportunity for Strategic Arms Control (New York: UN Office for Disarmament Affairs,, 2019), https://www.un.org/disarmament/wp-content/uploads/2019/02/hypersonic-weapons-study.pdf.
[34] Hypersonic Weapons: Background and Issues for Congress (DC: Congressional Research Service, 2023), 19, accessed on March 7, 2023, https://crsreports.congress.gov/product/pdf/R/R45811.
[35] Hypersonic Weapons: Background and Issues for Congress.

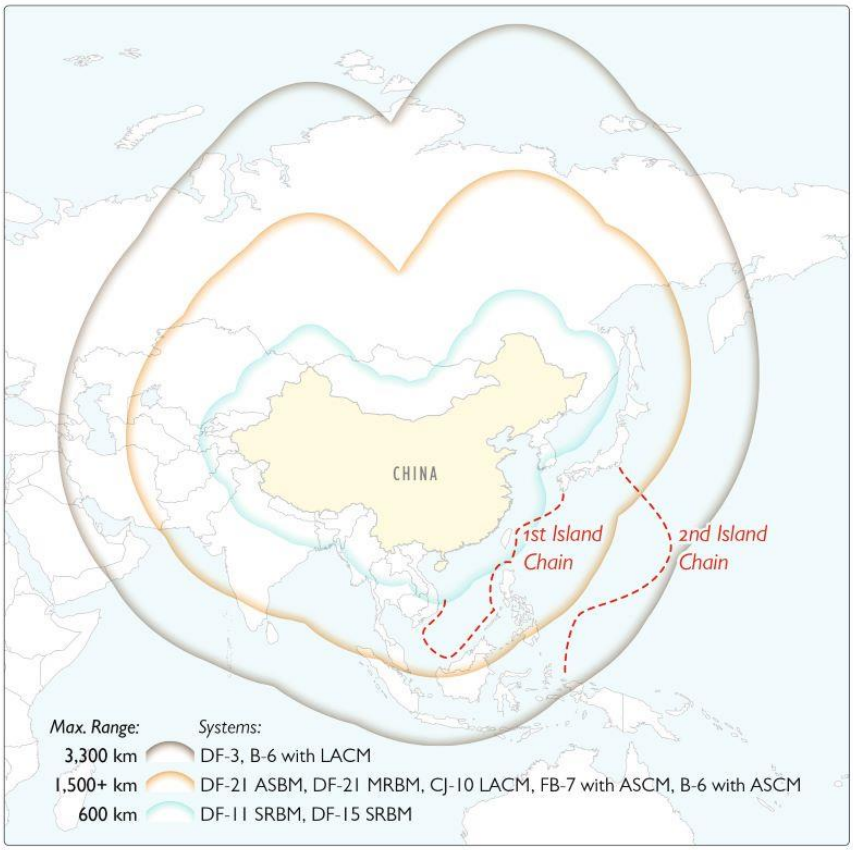

Figure 4. *The DF-21D easily covers the first island chain and large parts of the second island chain, enhancing its A2/AD capability in that region*[36]

Iran

In the broader Asian regional context, Iran also tested its hypersonic missile *Fattah* in June this year. This missile was tested a few months after the Islamic Revolutionary Guard Corps claimed the existence of an Iranian hypersonic missile. Reportedly, this missile has a range of 1,400km (870 miles) and can move at a speed of up to Mach 15 (5.1 km

[36] Sander Ruben Aarten, "The impact of hypersonic missiles on strategic stability: Russia, C hina and the U.S.," *Militaire Spectator* no. 4 (2020): 187, https://www.militairespectator.n l/thema/strategie/artikel/impact-hypersonic-missiles-strategic-stability.

or 3.2 miles per second) before hitting its target. Iranian officials have further indicated that a longer-range variant of this missile is expected to be unveiled in near future.[37]

Advent of HSW in South Asia

The Twilight of the 20th Century saw India pushing the South Asian Subcontinent towards the nuclear weapons black hole – a metaphorical point of no return – when it conducted the so-called 'peaceful' nuclear explosion in 1974. Living up to these tendencies of jeopardising peace in favour of upholding its prestige, the 21st Century saw India delving in the pursuit of novel technologies. In this regard, India claimed to have indigenously developed a Hypersonic Technology Demonstrator Vehicle (HSTDV) – an unmanned scramjet demonstration aircraft capable of hypersonic speed flight. This vehicle is built to be used as a carrier for hypersonic and long-range cruise missiles. Supposedly slated for flight tests in 2016, the tests of HSTDV did not happen until June 2019. The next testing took place on September 7, 2020 – a delay which may be attributed to the complexity of this technology.[38] This indigenous development has been termed as a "landmark achievement" by Indian Defence Minister Rajnath Singh when he confirmed that the hypersonic weapon testing was successful.[39]

In addition to indigenously developing hypersonic weapons, India has been engaged in procuring the technology from Russia and collaborated on the BrahMos missiles. BrahMos missile is a supersonic, ramjet-powered cruise missile and can be launched from air or sea. Several tests

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[37] Maziar Motamedi, "Iran has a hypersonic missile. What does that mean?," *Al-Jazeera*, June 7, 2023, accessed June 19, 2023, https://www.aljazeera.com/features/2023/6/7/iran-has-a-hypersonic-missile-what-does-that-mean.

[38] Samran Ali, "Assessing the Implications of India's Hypersonic Technology Test for Pakistan," *Center for Strategic and Contemporary Research*, September 11, 2020, accessed June 6 2023, https://cscr.pk/explore/themes/defense-security/assessing-the-implications-of-indias-hypersonic-technology-test-for-pakistan/.

[39] Press Trust India, " "Great Achievement": Made-In-India Hypersonic Vehicle Successfully Tested," *NDTV*, September 7, 2020, accessed January 15, 2023, https://www.ndtv.com/india-news/rajnath-singh-on-successful-test-of-long-range-missile-tech-landmark-achievement-2291608.

of the missile have been conducted since late 2004, from numerous platforms. The land-based test from the Pokhran testing range reached a speed of Mach 2.8. Collaboration between Russia and India is underway for the development of BrahMos II which is being designed to reach speeds up to Mach 7 using a scramjet engine.[40] It is estimated that BrahMos II may become operational by 2025, at the earliest. BrahMos II, once fully developed, will be the world's fastest cruise missile.[41] Concurrently, India continues to actively test the BrahMos cruise missile from its aerial and naval platforms.[42] Integration of the air-launched variant into India's Sukhoi fighter jets has also been planned since 2016, in an attempt to complement the Indian Air Force's capability to strike targets – both at sea or land – while being placed at large stand-off ranges. A successful test of an advanced variant of BrahMos was conducted in the Indian Ocean from a stealth destroyer on March 5, 2022.[43]

Indian Defence Research and Development Organisation (DRDO) tested a *Shaurya* missile on October 3, 2020, which can reach speeds of 7.5 Mach, and has a range of 750 kilometres - which was raised from 290 kilometres range possessed by its earlier variant. The missile is dual-capable and can be stored in a composite canister.[44] In order to ascertain the implications of these weapons in the South Asian construct, one must study the drivers behind Indian acquisition of HSWs.

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[40] Richard H. Speier, et al., "Hypersonic Missile Nonproliferation: Hindering the Spread of a New Class of Weapons," *RAND National Defense Research Institute* (2017): 24, rhttps://www.rand.org/pubs/research_reports/RR2137.html.

[41] Uswa Khan, "India's Joining of Hypersonic Club and its Repercussions on Pakistan," *Strafasia*, December 1, 2020, accessed June 6, 2023, https://strafasia.com/indias-joining-of-hypersonic-club-and-its-repercussions-on-pakistan/.

[42] "Defence tech: Indian Air Force successfully test fires Brahmos missile from Sukhoi SU-30 MKI," *Economic Times Government*, December 30, 2022, accessed June 5, 2023, https://government.economictimes.indiatimes.com/news/technology/defence-tech-indian-air-force-successfully-test-fires-brahmos-missile-from-sukhoi-su-30-mki/96619182.

[43] "IAF Successfully test-fires BrahMos Missile from Su30-MKI," *Times of India*, April 19, 2022, accessed June 5, 2023, https://timesofindia.indiatimes.com/india/iaf-successfully-test-fires-brahmos-missile-from-su30-mki-fighter-jet/articleshow/90942148.cms.

[44] "India Successfully Tests Nuclear-Capable Shaurya Missile," *Hindustan Times*, October 3, 2020, accessed June 5, 2023, https://www.hindustantimes.com/india-news/india-successfully-tests-nuclear-capable-shaurya-missile/story-fkYlozVJ5oq1MWO26GOwNN.html.

The Drivers of Indian HSW Program

Instead of any particular military objectives, developments in the technological domain are an important driver behind the pursuit of hypersonic weapons program[45] – especially by India. While the US, Russia and China may justify their developments by stating security concerns emanating from each other, the same criterion does not apply to India. This hypothesis may be proven by highlighting the primary utility of hypersonic weapons which is to dodge an adversary's BMD system through high speed and maneuverability. India proclaims that it faces an acute security threat from China, however, the hypersonic missiles currently being developed by it do not possess the range to effectively circumvent Chinese BMD. Similarly, Pakistan - with which India has fought three major wars, numerous mid-level crises and frequent border clashes - does not even possess a BMD system to warrant a counter-capability like HSW. Hence the argument that India will use these missiles to counter China can be safely discarded at this point in time. On the other hand, development of these missiles having shorter and intermediate ranges feed India's "counterforce temptations" and may be termed a harbinger of revision of the Indian 'No First Use' posture.[46] Shourya HSW with its 750km range can easily target all of Pakistan's strategic locations - thus augmenting a counter-force mission against Pakistan. Similarly, BrahMos is also 'uniquely tailored' for a counter-force role[47] - a posture that is designed solely as a means to target Pakistan. All this while India continues to divert the attention of global powers from its continued vertical proliferation by proclaiming China as a primary threat.

Concurrently, the domestic *Hindutva*-driven fascist narrative of the Hindu nation being superior to the rest is also a contributing factor in the

[45] James M. Acton, "Hypersonic Weapons Explainer," *Carnegie Endowment for International Peace*, April 2, 2018, accessed August 11, 2022, https://carnegieendowment.org/2018/04/02/hypersonicweapons-explainer-pub-75957.
[46] Christopher Clary and Vipin Narang, "India's Counterforce Temptations: Strategic Dilemmas, Doctrine, and Capabilities," *International Security* 43, no. 3 (2019): 7–52.
[47] Christopher Clary and Vipin Narang, "India's Counterforce Temptations: …."

growing domestic fervour in favour of exceptional technologies like the hypersonic missile program. Therefore, akin to India's prestige-driven nuclear weapons program, its pursuit of HSW capability may also be attributed to the inherent Indian desire to enhance its prestige and stature to allow it to rub shoulders with great powers like the P-5, which may in turn help it attain the much-desired seat in the United Nations Security Council. This prestige-driven approach greatly shapes Indian attitude as a regional actor trying to project its image globally, while considerably disregarding the strategic implications of its developments for the region, as discussed in detail below.

Strategic Effects of HSWs – Indo-Pak Theatre

The duality of HSWs does not just cover their ability to carry both types of warheads. It also covers their civilian and military applications as well as their utility as both defensive and offensive weapons. And while the set of these applications on one side of the spectrum could prove to enhance strategic stability – once possessed by a belligerent state like India whose adversary is conventionally much smaller and does not possess similar novel technologies and defenses – HSWs pose a massive threat to strategic stability.

India, with the successful production of scram-jet powered HSTDV has managed to send disruptive ripples through the rubric of strategic stability of the South Asian region. This is especially concerning as the currently prevailing *Hindutva* ideology in India is driving the ruling elite to create a fascist Hindu legacy fortified with military supremacy, both regionally and internationally. These developments have created a complex security environment for Pakistan which has endured the brunt of Indian belligerence for the past seven decades. The following paragraphs touch upon the implications of Indian HSWs on Pakistan's security and strategic stability.

Deterrence Instability

The deterrence equilibrium between two nuclear weapon states gets disturbed by the possession of a novel technology by one state only. It provides the possessor state with a considerable advantage in a conflict situation. Moreover, in peacetime, such an edge may entice the possessor state to indulge in coercive tactics to further suppress its adversary. A novel technology – in this case, the HSW possessed by India – could contribute to first-strike tendencies giving it a false sense of confidence to conduct a first-strike through HSWs, and then being able to employ its missile defenses to absorb a retaliatory strike by Pakistan.[48] The deterrence equation between India and Pakistan would be further hampered by their close geographical proximity and further reduction in flight times that hypersonic missiles entail due to their super speeds. With Pakistan lacking any counter-measure for HSWs, and the reduced flight time – from 5-10 minutes otherwise to a couple of minutes in case of a hypersonic flight – the deterrence equilibrium will be considerably jeopardised. Such technological edge and seemingly favourable conditions will further embolden India to pursue its belligerent and coercive tactics against Pakistan.[49] Figure 5 is a graphical representation of the compression of time brackets required for an HSW to reach its target.

[48] Ghazala Yasmin Jalil, "Implications of Emerging Hypersonic Missile Race," *Hilal* Magaz ine, December 3, 2020, accessed on, June 1, 2023, https://www.hilal.gov.pk/eng-article/de tail/NDcwOQ==.html,

[49] Ghazala Yasmin Jalil, "Implications of Emerging Hypersonic Missile Race..."

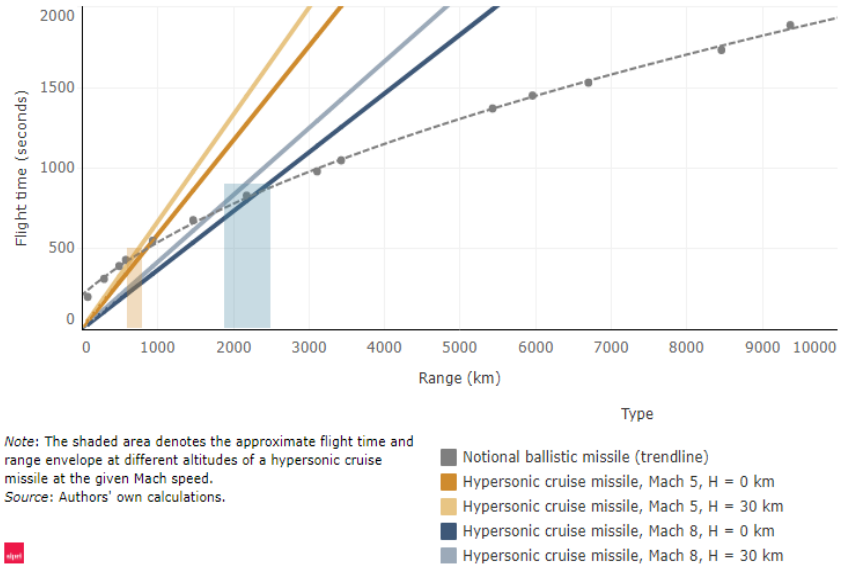

Figure 5. *Time Required by Hypersonic Cruise Missiles and Ballistic Missiles to Reach a Target* [50]

A target country's inability to detect, track, and defend against a hypersonic attack stems primarily from the HSW/HGVs evolving trajectory and in-flight maneuverability.[51] The booster's launch may be detected as in the case of a ballistic missile, but an HGV's maneuverable flight path complicates the situation. The issues in the detection of flight paths and predicting the target would make it tougher to redirect missile defense interceptors toward the incoming HGV.[52] An HGV can hit its target much faster than any other sub-sonic delivery means – which can also be seen as an added bonus for these missiles as they can eliminate the target with mere impact generated as a consequence of these high speeds.

[50] Kolja Brockmann and Dr Markus Schiller, "A matter of speed? Understanding hypersonic missile systems," *SIPRI*, February 4, 2022, accessed January 10, 2023, https://www.sipri.org/commentary/topical-backgrounder/2022/matter-speed-understanding-hypersonic-missile-systems.

[51] Defense Primer: Hypersonic Boost-Glide Weapons, Congressional Research Service (DC: U.S. Congress, 2022), https://sgp.fas.org/crs/natsec/IF11459.pdf.

[52] Defense Primer: Hypersonic Boost-Glide Weapons, Congressional Research Service.

Added to this, the absence of any effective defensive mechanisms to counter the HSWs makes the possessor states immune to deterrence by denial. These factors act as drivers to put the dilemma of conventional-nuclear entanglement in motion.

The term "conventional-nuclear entanglement" encompasses a scenario involving any dual-capable technology which, once deployed, cannot be distinguished into carrying either nuclear or conventional payload – therefore making it difficult for the target country to choose an adequate response option. HSWs may further be deemed a key example of technology which can cause conventional-nuclear entanglement due to its perceived capabilities and expected missions.[53] The situation is further complicated because of the speed and maneuverability, and consequently the inability of the target to detect incoming missile which may or may not be carrying nuclear warhead.

In South Asia, this entanglement could come into play if India decides to use a non-nuclear hypersonic missile as a counterforce tool, or to deter an adversary's nuclear capability. Similarly, New Delhi may decide to initiate a border clash with Beijing under the overhang of nuclear-tipped hypersonic missiles which may act as a deterrent against a conventionally superior China. It may be argued that while these scenarios could have destabilising effects, since they can contribute to mutual vulnerability between two adversaries, a more stable deterrence relationship may be ensured. However, even though this is a good prospect working in favour of the hypersonic technology, without confidence-building measures entailing mutual verification, misinterpretation, and misperception will pose serious risks to the overall strategic stability.[54] Keeping in view India's track record of rejecting CBM proposals by Pakistan, it is unlikely

[53] James Acton, "Escalation through entanglement: How the vulnerability of command-and-control systems raises the risk of inadvertent nuclear war," *International Security* 43, no. 1 (2018): 97–98.

[54] Kolja Brockman and Dmitry Stefanovich, *Hypersonic Boost-Glide Systems and Hyperson ic Cruise Missiles: Challenges for the Missile Technology Control Regime* (Stockholm: SI PRI, 2022), https://www.sipri.org/sites/default/files/2022-04/2204_hgvs_and_hcm_ challe nges_for_the_mtcr.pdf.

that India will engage in a similarly intrusive CBM covering HSWs. It may further be argued that the duality is not solely associated with HSWs and a number of short-range ballistic and cruise missiles also possess the capability to carry both conventional and nuclear weapons, hence HSW do not warrant such an extensive debate. However, the features such as speed, maneuverability, accuracy, and numerous operational applications of hypersonic weapons may make the associated ambiguity to be more difficult to deal with.[55] This is especially true when a weapon such as this, has the ability to significantly increase the possessor's war-fighting potential.

It seems to be a common fallacy to overestimate the capabilities of adversaries and underestimate one's own. A particularly problematic scenario that could arise from misperception, misinterpretation, or a combination thereof is a 'use it or lose it' situation where one party fears that the perceived capability of its adversary could disarm it and that if it does not strike first, it would lose its ability to launch its strategic weapons or retaliate. The party may even choose to strike with nuclear weapons because of its doubts about the capabilities of its non-nuclear options.[56]

Arms Race Instability

The vulnerability of the infrastructure required for maintaining a hypersonic program requires protection. In this regard, missile defences may be installed to serve this purpose.[57] Henceforth, the existing and new missile defence systems are acting as the drivers behind pursuit of HGVs and HCMs by numerous states. Similarly, some states are justifying their

[55] Maya Brehm and Anna de Courcy Wheele, "Hypersonic Weapons: Discussion on Discussion paper for the Convention on Certain Conventional Weapons (CCW)," *Article 36*, UK, February 2019.

[56] Kolja Brockman and Dmitry Stefanovich, *Hypersonic Boost-Glide Systems and Hypersonic Cruise Missiles: Challenges for the Missile Technology Control Regime* (Stockholm: SIPRI, 2022), 12, https://www.sipri.org/sites/default/files/2022-04/2204_hgvs_and_hcm_ challenges_for_the_mtcr.pdf.

[57] Maya Brehm and Anna de Courcy Wheele, "Hypersonic Weapons: Discussion on Discussion paper for the Convention on Certain Conventional Weapons (CCW)," Article 36, UK, February 2019.

acquisition of HGVs and HCMs as a counter to others' relentless pursuit of missile defence systems.[58] This, in the near future, will result in a never ending cycle with new missile defence systems leading to the development of missiles capable of defeating these defences. This in turn will result in the development of more sophisticated defences which can counteract such missiles. In the South Asian theatre, while India did not face any of these threats and merely sought prestige, its developments are on the verge of triggering an arms race in the region. This would result in the unraveling of secured strike capability and will lead to overall regional strategic instability.[59] The secrecy surrounding India's hypersonic program is fueling Pakistan's threat perceptions, which may in turn lead to the changed dynamics of an arms race.

The dual nature of HSWs makes it rather cumbersome to assess the prospective implications of these weapons on the existing arms control and disarmament arrangements. However, one important aspect of this new technology warrants immediate attention towards the possibility of the resumption of weapons testing. This would be necessary to attest to the design and efficacy of the nuclear warheads for HGVs. Hence the possibility of the Comprehensive Nuclear Test Ban Treaty (CTBT) ever entering into force will become much less. Similarly, the arms race between states for the acquisition of HSWs has already begun. These developments indicate an imminent threat to the arms control and disarmament regime, consequently posing a significant risk to the global security and strategic stability.[60] India has very deftly avoided engaging with the prospects of a CTBT by proclaiming a unilateral moratorium on nuclear testing and projecting on international forums that "if the CTBT

[58] Kolja Brockman and Dmitry Stefanovich, *Hypersonic Boost-Glide Systems and Hyperson ic Cruise Missiles: Challenges for the Missile Technology Control Regime* (Stockholm: SI PRI, 2022), 12, https://www.sipri.org/sites/default/files/2022-04/2204_hgvs_and_hcm_ ch allenges_for_the_mtcr.pdf.

[59] Kolja Brockman and Dmitry Stefanovich, Hypersonic Boost-Glide Systems and Hyperso nic Cruise Missiles, 13.

[60] Maya Brehm and Anna de Courcy Wheele, "Hypersonic Weapons: Discussion on Discus sion paper for the Convention on Certain Conventional Weapons (CCW)," Article 36, UK , February 2019.

did not contain a time-bound commitment to nuclear disarmament, then it (India) would oppose the treaty." In 1996, Indian Ambassador Arundhati Ghose stated that the Conference on Disarmament should start negotiations on a time-bound program for the elimination of nuclear weapons and that India was committed to a CTBT that would "promote the universally enunciated goal of total nuclear disarmament."[61] This position has been maintained knowing full well that the P5 states will never work towards the attainment of complete disarmament.

Indian scholars have time and again proposed the possibility of the resumption of nuclear testing by the country in order to "obtain better yield-to-weight ratios or (to develop) weapons of the megaton variety."[62] A new narrative in the making builds on the idea that a "supreme emergency"[63] may force India to resume nuclear testing and instead of getting penalised for it, the US should look for ways to facilitate the Indian quest to strengthen itself militarily to be able to balance China which is "fundamentally in American interest."[64] Therefore, Indian nuclear testing is no longer a remote possibility now and may just require a slight nod from the West, thereby putting India in direct violation of the spirit of CTBT which it follows through the proclaimed unilateral moratorium on nuclear testing.

On June 27, 2016, India became a member of the Missile Technology Control Regime (MTCR) which also covers the issue of dual-capable delivery systems i.e., those possessing capability to deliver either nuclear or a conventional payload at any given time. This is evident in the categorical mention of missiles and UAVs "capable of" delivering chemical, biological or nuclear warheads in the MTCR guidelines and

[61] Dinshaw Mistry, "India and the Comprehensive Test Ban Treaty," (PhD Diss., University of Illinois at Urbana-Champaign, 1998), 17.
[62] Manpreet Sethi, "Nuclear Arms Control and India: A Relationship Explored," *Arms Control Association*, September 2010, accessed May 23, 2023, https://www.armscontrol.org/act/2010-09/nuclear-arms- control-india-relationship-explored.
[63] Ashley Tellis, "Striking Asymmetries: Nuclear Transitions in Southern Asia," *Carnegie Endowment for International Peace*, 2022.
[64] Ashley Tellis, "Striking Asymmetries: Nuclear Transitions in Southern Asia, 255.

annex.[65] Additionally, the MTCR annex also covers technologies and equipment which are deemed "relevant to" delivery vehicles that fall under the MTCR's payload and range parameters.[66] As per the non-proliferation export control mechanisms, a delivery system technology like the hypersonic missiles – with their ability to drastically disrupt the strategic balance between states, due in part to their dual-use nature – do in fact fall under the ambit of the MTCR irrespective of the nuclear or conventional end-use which they may be destined for.[67] Similarly, key technologies required in the production of HGVs and HCMs are already covered under the MTCR control lists.[68] This makes India, being a member of the MTCR, a violator of the regime's guidelines because of its development of HSWs. These rampant violations and disregard of international export control infrastructure by India and the silence of the western community to the same signify the double standards being followed to accommodate India's rise as a regional hegemon. However, this western blind eye is contributing to India's massive investments in military and nuclear technologies – even those which do not fall under the ambit of capabilities that are necessary to ensure credible minimum deterrence – causing considerable damage to strategic stability.

Crisis Instability

States pursue conflict resolution only when they are faced with a certain level of vulnerability vis-à-vis their adversary. Technologies like the HSWs – which provide a considerable edge due to their precision and efficacy – once acquired by prestige and hegemony-driven states like India, reduce the inclination for any conflict resolution. Furthermore, the

[65] "MTCR, Guidelines for Sensitive Missile-Relevant Transfers", *Nuke Fas*, accessed Febru ary 11, 2023, https://nuke.fas.org/control/mtcr/text/mtcr_handbook_guide-annex.pdf.
[66] "MTCR, Guidelines for Sensitive Missile-Relevant Transfers", *Nuke Fas*.
[67] Joshua Pollack, "Boost-glide weapons and US-China strategic stability," *Nonproliferation Review* 22, no. 2 (2016), https://www.researchgate.net/publication/2930 14314_Boost-glide_Weapons_and_US-China_Strategic_Stability.
[68] Kolja Brockman and Dmitry Stefanovich, *Hypersonic Boost-Glide Systems and Hyperson ic Cruise Missiles: Challenges for the Missile Technology Control Regime* (Stockholm: SI PRI, 2022), 18, https://www.sipri.org/sites/default/files/2022-04/2204_hgvs_and_hcm_ ch allenges_for_the_mtcr.pdf.

strategic ambiguity which HSWs entail, as well as the uncertainty surrounding India's nuclear use posture, will significantly contribute to crisis instability in the event of any conflict situation in South Asia. Moreover, possessing a novel capability like hypersonic technology – whose defense does not yet exist in the region – India will be tempted to coerce and pressurise Pakistan in both conventional and nuclear domains while continuing to conduct a Hybrid War against the latter.

Shaurya – an intermediate range hypersonic weapon — is being seen as a tool to facilitate India's move away from the proclaimed nuclear no first use (NFU) to a first use policy. The hypersonic weapons program is further being seen to indicate New Delhi's shift towards a counterforce strategy, and these two revisions go in line with the recent movement in the Indian political circles to review the long-standing nuclear use policy. With the HSWs in its arsenal, India may try to overwhelm Pakistan with counterforce strikes as well as by using these weapons in a conventional role to decapitate Pakistan conventionally. [69]

As for the detection dilemmas, whether intermediate or long-range, the delivery vehicles (missiles) for HGVs can be detected in the launch phase by early-warning satellites and early-warning radars installed closer to the launch pads of these missiles. This is the only phase during the whole flight of an HGV or HCM wherein this weapon can be detected and destroyed, as their maneuverability and speed make them difficult to be detected in the glide and terminal/re-entry phases – even by satellites or terrestrial radars. These factors make it harder to ascertain the actual target of the missile.[70] Keeping in view that HGVs and HCMs can carry either nuclear or conventional payload at a given time, this ambiguity once coupled with the ambiguity of its target – both the target state and the

[69] Gabriel Honrada, "India's hypersonics hint at nuclear strike policy shift," *Asia Times*, December 24, 2021, accessed October 5, 2022, https://asiatimes.com/2021/12/indias-hypersonics-hint-at-nuclear-strike-policy-shift/.

[70] Paul Labbé, Ahmed Ghanmi and Mohamed Abdelazez, "Current and future hypersonic threats, scenarios and defence technologies for the security of Canada," *Defence Research and Development Canada*, (2020), https://cradpdf.drdc-rddc.gc.ca/PDFS/unc413/p814591_A1b.pdf.

exact target location within that state – complicates deterrence, especially in case of States wherein nuclear and conventional forces are co-located. Moreover, this scenario may culminate into escalation if the target country – or its neighbouring countries – are unable to timely ascertain the intent of the incoming missile, and launching State.

To avoid such a scenario, the country initiating a hypersonic strike may decide to communicate its intent to non-target States, or it may even choose to communicate whether the missile is carrying a nuclear or conventional payload. However, the possibility of miscommunication, misinterpretation, and miscalculation will remain high. Since sea-launched ballistic missiles and land-based intercontinental ballistic missiles have never been used in active combat before, their deployment would further contribute to the aforementioned misunderstanding. This is because there is no awareness yet of how the early-warning and command and control systems would react to their use.[71] Additionally, while India has indeed developed the HGVs, it has not become adept at managing these weapons. This was made evident in the recent BrahMos misfiring incident that could have resulted in inadvertent escalation, had Pakistan taken it as a preemptive strike. Furthermore, the targeting ambiguity – which does not get clear until the final moment when the hypersonic weapon strikes its target – leads to the possibility of miscalculation and nuclear escalation even if the missile itself is detected in time.

Options for Pakistan

A detailed study of the South Asian dyad, which comprises two nuclear-armed adversaries – India and Pakistan – clearly indicates an action-reaction model since the inception of both states and consequently their nuclear programs. In the face of India's growing military program and Pakistan's own economic constraints, the latter's defence industry continues to evolve to effectively develop counter-options. Pakistan is

[71] Pavel Podvig, "Risks of Nuclear Command and Control Accidents," in *Understanding Nu clear Weapon Risks*, ed. John Borrie, Tim Caughley and Wilfred Wan (Geneva: UNIDIR, 2017), 57, accessed on, January 15, 2023, https://unidir.org/sites/default/files/publication/pdfs//understanding-nuclear-weapon-risks-en-676.pdf.

now capable enough to produce missiles and tactical weapons which can easily neutralise India's defence lines, if provoked.

However, these developments by Pakistan have not come at the expense of its responsibility as a nuclear weapon state which entails non-pursuance of offensive weapons and technologies. This is in stark contrast to India which has continued to put the South Asian deterrence stability under duress – merely to enhance its stature and prestige – by adding advanced weaponry and technologies in its inventory. Pakistan's reactive approach to some of these developments has been necessary and has helped maintain a credible balance vis-à-vis India while ensuring a robust deterrence equation in the region. Pakistan has and will continue to strengthen and make its defences invincible while pursuing the policy of Full Spectrum Deterrence under the overarching concept of Credible Minimum Deterrence. To quote former Chairman Joint Chiefs of Staff Committee General Zubair Hayat, India continues to introduce weapons of instability in the region with the help of third parties, yet "we have and we will continue to provide necessary response to ensure that strategic balance is maintained and Pakistan's deterrence remains credible."[72] Similar sentiments were expressed when former DG SPD Lieutenant General (retd) Khalid Kidwai noted that Pakistan has "adequate response options which will disallow any disturbance of the strategic balance or strategic stability. That fundamental policy will prevail."[73] The paragraphs below discuss some of the response options that Pakistan may pursue in the face of the Indian expansion of its missile inventory with the induction of HGVs.

Developing Pakistan's own HSW

India's test of an HSTDV has managed to raise concerns in Pakistan, as these platforms could potentially give India a strategic advantage over

[72] Syed Ali Zia Jaffery, "The S-400 Deal and Pakistan's Quest for Strategic Stability," *Pakistan Politico*, November 14, 2018, accessed May 26, 2023, https://pakistanpolitico.com/the-s-400-deal-and-pakistans-quest-for-strategic-stability/

[73] "Pakistan to maintain strategic balance with India, says NCA Adviser," *Dawn*, November 7, 2018, accessed May 26, 2023, https://www.dawn.com/news/1444087.

Pakistan, keeping in view their speed and maneuverability. No counter-measures presently exist to neutralise an HSW due to its high speed and maneuverability. Yet, if Pakistan decides to pursue HSW technology, thinking that this will deter India from any belligerence, it will be seen as a tit-for-tat approach and lead to an arms race between India and Pakistan. Moreover, whether possession of an HSW by Pakistan will prevent India from launching a preemptive counter-force strike against it or not, cannot be ascertained. However, the existence of a high-speed weapon like HSW, coupled with a ballistic missile defence (though lacking hundred per cent efficacy) may induce a false sense of security in India to pursue a counter-force targeting against Pakistan as a preemptive measure. To neutralise the latter's defences which will have considerable implications for Pakistan's deterrence posture will, however, have a remote probability of counter offense. [74]

Pakistan will need to explore several options to counter India's development of hypersonic missiles. Ideally, Pakistan could pursue hypersonic missile technology to counter Indian developments. The country can allocate more funds towards research and development of hypersonic missiles and establish partnerships with other countries to gain expertise and knowledge. By developing its own hypersonic missiles, Pakistan can level the playing field and deter India's military capabilities. However, the prevalent economic situation in Pakistan may not allow it to delve into the development of these missiles which come with a hefty price tag. Moreover, given the technological limitations, Pakistan may opt for a 'deterrence by punishment' posture, instead of 'deterrence by denial.' Concurrently, being a responsible nuclear weapon state, Pakistan does not endorse the idea of weapon to weapon match with its adversary. Rather it seeks to plug the gaps in the deterrence equation which are created as a result of the Indian development of destabilising technologies.

[74] Dr Adil Sultan and Itfa Khursheed, "Hypersonic Weapons in South Asia: Implications for Strategic Stability," *IPRI Journal* 11, no 1 (2021): 61-81, https://journal.ipripak.org/wp-content/uploads/2021/07/Article-3-IPRI-Journal-XXI-1.pdf.

Cruise Missiles and Short-Range Ballistic Missiles (SRBMs)

If Pakistan decides not to employ nuclear weapons in the face of any Indian aggression by conducting a conventional hypersonic strike, cruise missiles can serve to be an important tool to respond. Pakistan's cruise missiles have a greater targeting accuracy and penetration capability which could easily neutralise the Indian missile defences. Pakistan Navy is currently developing a supersonic cruise missile that can even target moving targets[75] and hence can be used to neutralise India's second-strike options. Pakistan can therefore opt to enhance the features of its existing cruise missiles while increasing the numbers too. The "shoot and scoot" capability inherent in Pakistan's SRBMs increase their chances of evading an incoming strike from the adversary. This mobility of SRBMs can be further enhanced in addition to a quantitative increase in the number of these missiles. [76] Said attributes will work to enhance the survivability of Pakistan's nuclear weapons which can in turn evade the chances of escalation by India.

Developing Second Strike Capability

Another way to increase the survivability of Pakistan's nuclear weapons is through the acquisition of second-strike capability. As Albert Wohlstetter notes, "the ability to survive adversary's pre-emptive attack is a precondition to maintain deterrence," hence, providing a justification for Pakistan to develop nuclear submarines capable of housing nuclear weapons.[77] This capability will considerably reduce the possibility of the launch of a preemptive strike using nuclear or conventionally-tipped HSW by India. Pakistan already possesses submarine launched cruise missile

[75] Samran Ali, "Assessing the Implications of India's Hypersonic Technology Test for Pakistan," Center for Strategic and Contemporary Research, September 11, 2020, accessed June 6 2023, https://cscr.pk/explore/themes/defense-security/assessing-the-implications-of-indias-hypersonic-technology-test-for-pakistan/.

[76] Sultan et al, *HSWs in South Asia*, 18.

[77] Sufian Ullah, "Strategic Calculations Behind Pakistan's Pursuit of Sea-Based Nuclear Deterrence," *South Asian Voices*, June 11, 2020, accessed June 3, 2023, https://southasianvoices.org/strategic-calculations-behind-pakistans-pursuit-of-sea-based-nuclear-deterrence/#:~:text=Although%20Pakistan%20does%20not%20possess,to%20land%2Dbased%20nuclear%20forces.

Babur III with a range of 450 km. However, this range is insufficient cover for an attack on the Indian mainland. Therefore, increasing the ranges of SLCMs and developing SLBMs is imperative for Pakistan to be able to target major Indian cities and deter India from opting for a preemptive strike.[78] The second-strike capabilities can be further supplemented with failed deadly mechanisms. In that case even if deterrence fails and the weapon systems are compromised, they will induce some damage to the opponent nonetheless predetermined by the possessor state.

Diplomatic Engagement and Confidence Building

Despite India's rejection of numerous confidence building proposals in the past, Pakistan should continue to push for diplomatic engagement to prevent any inadvertent escalation and miscalculation in the future. The incident of misfiring of a BrahMos missile from India should be taken as a baseline by Pakistan to build its case in favour of such an engagement. Pakistan can also propose a flight test ban on all weapons which fly at hypersonic speeds. The existence of a hotline between India and Pakistan is a positive step towards achieving broader benefits to ensure crisis stability, especially keeping in view the ambiguities related to HSWs. While India failed to use this hotline during the BrahMos incident, the consequences of a potential miscalculation by Pakistan in the aftermath of that incident may be kept in mind by India in the future.

Conclusion

HSW by virtue of their capabilities fulfill both Clausewitz and Sun Tzu's respective philosophies entailing the achievement of eventual victory i.e., maximum gains with limited resources and winning without losing i.e. preventing any aggression. This novelty does not fit as perfectly on any other weapon system, thereby enticing all the major powers to invest in the development of HSWs despite the associated hefty price tag. Yet, there is India which has zero utility for these weapons as it is faced with an adversary in Pakistan. Pakistan does not possess a BMD system nor

[78] Sultan et al, *HSWs in South Asia*, 19.

does it aspire to acquire one in future; the same holds true for China, projected as the primary adversary of China. The fascist Indian ruling elite is increasingly opting for war-fighting capabilities and technologies that only enhance its prestige without enhancing strategic stability; rather conversely, these weapons only disrupt peace and stability at various levels. Despite India's continued efforts to damage deterrence and strategic stability in the region, the Western world continues to turn a blind eye toward its activities. Possession of such weapons by India - without the presence of any counter-measures with Pakistan - will increasingly entice India to conduct provocative actions along the Line of Control. Similarly, due to their hypersonic speeds, the HSWs greatly compress the response times which will further make it difficult for Pakistan to retaliate effectively on time. In this scenario, Pakistan can opt to strengthen its deterrence by investing in the enhancement of the capabilities of its existing weapons systems such as its cruise missiles and SRBMs. It can further speed up the process of acquisition of its second-strike capability.

Sun Tzu, the ancient military strategist said, "invincibility lies in the defence."[79] This entails strengthening defense instead of opting for offensive maneuvering in order to subdue an enemy. Pakistan's military posture is an embodiment of this approach whereby the country has always been and will continue to be inclined towards strengthening its defenses in the face of an ever-belligerent adversary.■

[79] Sun Tzu, *Sun Tzu on The Art of War*, trans. Lionel Giles (Leicester, England: Allandale Online Publishing, 2000), 12. https://sites.ualberta.ca/~enoch/Readings/The_Art_Of_War.pdf, accessed June 19, 2023.