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## Assessing the US Hypersonic Missile Test

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Image Source: ABC News



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On July 12, 2022, the US Air Force successfully tested its hypersonic missile (HM), the Air-Launched Rapid Response Weapon (ARRW) booster. This booster was carried aloft under the wing of a B-52 aeroplane<sup>1</sup>. Lockheed Martin, which has developed this HM, said in a statement that “this second successful test demonstrates ARRW's ability to reach and withstand operational hypersonic speeds, collect crucial data for use in further flight tests, and validate safe separation from the aircraft.”<sup>2</sup>

This US success follows that of Russia and China, which have been engaged in the rapid development of hypersonic weapons.<sup>3</sup> Research to develop this HM goes back seven decades. The aim of this ARRW missile is to fly at five times the speed of sound (Mach 5) and be manoeuvrable enough to avoid interception by the enemy missile defence system. It has a range of 1600 km. The US has been trying to work on this combination of speed and manoeuvrability, since the mid-1950s. Several challenges still remain, and this ARRW will not be operationally deployed till next year.

The program executive officer belonging to the Armament Directorate said, “We have now completed our booster test series and are ready to move forward to all-up-round testing later this year.”<sup>4</sup> It means both the booster and the warhead. The USA is the only country that has a global interest, that it needs to protect. Therefore, it feels the need for HM as a means of speedy delivery. In 2022, the US Department of Defense asked for US\$ 3.8 billion<sup>5</sup> for its hypersonic weapons budget. This is 20 per cent more than last year. China, meanwhile, has already operationally deployed the DF-17. ARRW and DF-17 are similar since they are both hypersonic glide vehicles (HGV). This HGV is conventionally tipped in ARRW and in DF-17 China has claimed it to be dual use.

China is focusing on threats from US freedom of navigation operations in the South China Sea, on the border with India. So, it makes sense for China to launch DF-17 from the ground. The DF-17 is basically a ballistic missile, and on top of it is mounted the HGV. This HGV is such that it manoeuvres and does not follow a committed flight trajectory (like that of a ballistic missile), making it very difficult to intercept. A truck carries this missile, which is elevated for launch. DF-17 has a range of 1800 to 2500 km.<sup>6</sup> The booster rocket then launches it into the near-space atmosphere and finally releases the HGV. As far as Russia is concerned, it too, like China, has made great progress. Russia has operationally deployed the Avangard HM. It was inducted on December 27, 2019. The Avangard is mounted on the top of a missile that was developed approximately thirty-three years ago, which is known as SS19. According to President Putin, it can travel more than 20 times the speed of sound.<sup>7</sup> President Putin said that the Avangard can penetrate missile defence

systems.<sup>8</sup> He also said in December 2019, “Not a single country possesses hypersonic weapons, let alone continental-range hypersonic weapons”<sup>9</sup>

Avangard is a hypersonic boost-glide vehicle (meaning HGV), that has been created by Russia to checkmate the decision of America to quit the Anti-Ballistic Missile Treaty.<sup>10</sup> It is a challenging situation for missile defences, as it is 10 to 20 times less visible to early warning radars.<sup>11</sup> HM will decide the critical factor of survivability of the nuclear arsenal, as well as see inside the Observe Orient Decide Act loop of any rival country.

It is evident that the three big powers (US, China, and Russia) are engaged in developing HGVs. No constraint exists on these developments. No possibility of negotiations exists to address these issues, especially due to the Ukraine War all arms control talks are on pause.<sup>12</sup> It is the US that has put a pause<sup>13</sup>. In this light, the success of ARRW will only spur others to advance their own capabilities. So, in all this, strategic stability will be the loser.

#### NOTES:

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<sup>1</sup> Mike Stone, “U.S. successfully tests pair of Lockheed hypersonic missiles”, *Reuters*, July 14, 2022, <https://www.reuters.com/business/aerospace-defense/us-successfully-tested-lockheed-hypersonic-missile-this-week-sources-2022-07-13/> Accessed on July 15, 2022.

<sup>2</sup> Ibid

<sup>3</sup> Ibid

<sup>4</sup> Mike Stone, “U.S. successfully tests pair of Lockheed hypersonic missiles”, *Reuters*, July 14, 2022, <https://www.reuters.com/business/aerospace-defense/us-successfully-tested-lockheed-hypersonic-missile-this-week-sources-2022-07-13/> Accessed on July 15, 2022.

<sup>5</sup> Mike Stone, “Pentagon says hypersonic weapons are too expensive”, *Reuters*, October 12, 2021, <https://www.reuters.com/business/aerospace-defense/pentagon-says-hypersonic-weapons-are-too-expensive-2021-10-12/> Accessed on July 18, 2022.

<sup>6</sup> “DF-17”, Missile Threat CSIS Missile Defense Project, August 2, 2021, <https://missilethreat.csis.org/missile/df-17/> Accessed July 18, 2022.

<sup>7</sup> Jonathan Marcus, “Russia deploys Avangard hypersonic missile system”, *BBC News*, December 27, 2019, <https://www.bbc.com/news/world-europe-50927648> Accessed July 18, 2022.

<sup>8</sup> Jay Desai, “Advent of the Hypersonic Missiles: Extremely dangerous for strategic stability?” *The Kootneeti*, September 15, 2021, <https://thekootneeti.in/2021/09/15/advent-of-the-hypersonic-missiles-extremely-dangerous-for-strategic-stability/> Accessed July 25, 2022.

<sup>9</sup> Jonathan Marcus, “Russia deploys Avangard hypersonic missile system”, *BBC News*, December 27, 2019, <https://www.bbc.com/news/world-europe-50927648> Accessed July 18, 2022.

<sup>10</sup> Jay Desai, “Advent of the Hypersonic Missiles: Extremely dangerous for strategic stability?” *The Kootneeti*, September 15, 2021, <https://thekootneeti.in/2021/09/15/advent-of-the-hypersonic-missiles-extremely-dangerous-for-strategic-stability/> Accessed July 25, 2022.

<sup>11</sup> Ibid

<sup>12</sup> Steven Pifer, “The Russia-Ukraine War: A Setback for Arms Control”, *Stanford University*, May 23, 2022, <https://cisac.fsi.stanford.edu/news/russia-ukraine-war-setback-arms-control> Accessed July 25, 2022.

<sup>13</sup> Ibid

