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New Year and Old Resolutions: Analysing North Korea's Hypersonic and Underwater Nuclear Weapons

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Source: [Hypersonic Missile Test-fire Conducted in DPRK](#)



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The year 2024 started with major weapon tests on the Korean Peninsula. On January 15, 2024, North Korea claimed that it had successfully test-fired a new ballistic missile tipped with a hypersonic warhead. The test was Pyongyang's first test this year and the first-ever test of a solid-fuel hypersonic Intermediate-Range Ballistic Missile (IRBM). The official press release states, "The test-firing was aimed at confirming the gliding and manoeuvring characteristics of the intermediate range hypersonic mobile control warhead and the reliability of the newly-developed multistage high-thrust solid-propellant motors."¹ The test was conducted at a time when the relations between North and South Korea are deteriorating at a fast pace, and after Kim branded Seoul as his "principal enemy" with an undertone of feasible greater military confrontation.² Several of the reports published by major news media houses also reported that North Korea has tested a hypersonic weapon. However, a close inspection of the test and the recent history of North Korea's claim about its newly acquired hypersonic technologies is warranted. Just days after its first ballistic missile test of 2024, North Korea also tested an underwater nuclear weapon delivery system soon after a tri-lateral naval exercise conducted by the US, South Korea, and Japan. The underwater nuclear weapon delivery system test also needs some clarification regarding its claimed capabilities and strategic purpose.³

Hypersonic and MaRV

A hypersonic missile essentially travels within the atmosphere at a speed greater than Mach 5 and can manoeuvre in the atmosphere for most of the flight. Hypersonic missiles are essentially of two types: boost-glide missiles and cruise missiles. A boost-glide missile entails a rocket motor that helps accelerate the missile to a high speed and a glide body with a warhead. Once a glide body detaches from the spent rocket, the boost-glide missile uses its kinetic and potential energy and lift to fly at a hypersonic range. A hypersonic cruise missile also initiates speed with a rocket booster but maintains its speed throughout its flight using a jet engine called ramjet or scramjet. A Manoeuvrable Re entry Vehicle (MaRV) is a ballistic missile warhead capable of changing trajectory when it re-enters the atmosphere for precision strikes. The point of consideration here is that both MaRV and boost-glide missiles follow non-ballistic trajectories, which is not the case with ballistic missiles. More importantly, while differentiating between a hypersonic weapon and a MaRV, the point of midcourse manoeuvring and terminal phase manoeuvring need specific attention. A boost-glide hypersonic weapon can manoeuvre during the midcourse and terminal phases. While a MaRV can only manoeuvre during the terminal phase.

The Hypersonic Claim

The January 2024 claim is not the first time North Korea has claimed to have acquired hypersonic technology. In 2021, North Korea tested a new hypersonic missile, the Hwasong-8, for the first time. The Hwasong-8 test, as claimed by North Korean state media in 2021, “confirmed the navigational control and stability of the missile [booster] and also its technical specifications including the guiding manoeuvrability and the gliding flight characteristics of the detached hypersonic gliding warhead.” Additionally, the test reportedly “ascertained the stability of the engine as well as of missile fuel ampoule.”⁴ North Korea conducted its second test of a hypersonic missile in January 2022. After the test, the state-owned KCNA reported that the “hypersonic gliding warhead detached and separated from its rocket booster and manoeuvred 120 km before it precisely hit a target 700 km away.”⁵ It was unknown whether, during the second test, North Korea used Hwasong-8 or not.

After the tests in 2021 and 2022, the official press release from North Korea mentioned specific core characteristics of its missile. The tests emphasised ‘guiding manoeuvrability’ and ‘gliding flight.’ The 2022 and 2023 official press releases put emphasis on ‘precision strike.’ These three elements, guiding manoeuvrability, gliding flight and precision strike, are essential characteristics of hypersonic weapons, but these elements are also characteristics of a MaRV. This raises the question as to what exactly North Korea tested on January 5, 2024: a hypersonic weapon or a MaRV.

On January 14, 2024, North Korea seemingly tested a solid-propellant IRBM carrying MaRV rather than a traditional reentry vehicle or a hypersonic boost-glide weapon. The IRBM has instrumentalised the first two stages of Hwasong (HS)-18 stages, a three-stage solid-propellant Intercontinental Ballistic Missile (ICBM).⁶ North Korea tested HS-18 for the third time in December 2023 and regarded the HS-18 ICBM as operationally deployed.⁷ This was North Korea’s first ballistic missile test of 2024. The test, however, followed a trilateral naval drill by the US, South Korea and Japan. The naval exercise, among others, was meant to augment deterrence and response capabilities against North Korean nuclear, missile and underwater threats.⁸ The exercise involved nine warships, including the U.S. aircraft carrier Carl Vinson (CVN-70), a Nimitz-class nuclear-powered aircraft carrier. In response to the naval exercise, North Korea, on January 19, 2024, tested its Haeil-5-23 nuclear-capable unmanned underwater attack weapon in the Sea of Japan.

Underwater Nuke

The Haeil-5-23, as claimed by Pyongyang, is a nuclear-capable unmanned underwater attack weapon.⁹ Not much is known about the specifications of this weapon system. However, in 2021, Kim Jong-un declared quite a few key strategic goals for North Korea's nuclear programme and one among these was related to a nuclear-powered submarine and an underwater-launch nuclear strategic weapon.¹⁰ North Korea first revealed the Haeil system in March 2023 as an Unmanned Underwater Vehicle (UUV). The March test, according to Pyongyang, "correctly estimated all the tactical and technical specifications and navigational and technical indices of the underwater nuclear attack drone, verified its reliability and safety, and fully confirmed its lethal strike capability."¹¹ It was also noticed in the press release that North Korea has been testing the UUV since 2012 to augment its self-defence capabilities and counter its adversaries' military and technical superiority.¹² More importantly, the mission for which this particular UUV has been developed is to have stealth capabilities into the operational waters and to make a "super-scale radioactive tsunami through underwater explosion."¹³

Serving Twin Objectives

Does North Korea have the capability to create such a UUV with nuclear ambition? Can the same weapon serve any strategic purpose, as claimed time and again by North Korea? The experts think¹⁴ that North Korea does have the capacity to develop such a weapon system. However, experts are also of the view that to build such a system, North Korea need advanced nuclear weapons systems breakthrough, which it might not have currently.¹⁵ More importantly, the weapon's demonstration has more political underpinnings than military utility. The following are the reasons for demonstrating this particular weapon:

- (a) Haeil-5-23 is an inferior weapon when compared to the existing ballistic and cruise missile inventories of North Korea. The demonstration essentially helps North Korea communicate the message of diversification of its nuclear weapons.
- (b) The message of diversification helps North Korea create an environment where any preemptive strike will not lead to the decapitation of its nuclear capabilities.

(c) Even though the underwater nuke has limited range and speed, which makes it vulnerable to anti-submarine warfare, it still supports North Korea in showing its technological reach, which only major powers have..

Conclusion

A MARVed IRBM, which can manoeuvre, can be used to complicate missile defences. It makes sense for Pyongyang to develop it because of the ongoing US efforts to strengthen the missile defence of Guam. The US DoD is making every effort to build military infrastructure in Guam. The DoD's five-year plan outlined in the Future Years Defence Programme (FYDP) seeks to spend approximately US \$7.3 billion on military construction from FY2024 through FY2028. More importantly, to implement an integrated missile defence system in Guam, the Missile Defence Agency of the US is planning to invest an additional US \$1.7 billion.¹⁶ Furthermore, South Korea has again started its process of implementing its indigenous ballistic missile defence programme under the aegis of the Korean Air and Missile Defence (KAMD) system. A MARVed IRBM can augment North Korea's capability to counter the KAMD system during a heightened crisis. A UUV with nuclear capabilities might not work as a strategic deterrent against North Korea's adversaries. However, it can still create havoc in terms of knocking out the docks and ports meant for military objectives.

NOTES:

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³ David Wright and Cameron L. Tracy, "Hypersonic Weapons: Vulnerability to Missile Defenses and Comparison to MaRVs," *Science & Global Security*, p. 4.

⁴ Masao Dahlgren, "North Korea Launches Hypersonic Missile Into Sea: State Media," *Missile Threat*, Centre for Strategic and International Studies, September 28, 2021, <https://missilethreat.csis.org/north-korea-launches-hypersonic-missile-into-sea-state-media/>. Accessed on January 17, 2024.

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⁶ Kim Tong-Hyung, "The US, South Korea and Japan conduct naval drills in a show of strength against North Korea," *The Associated Press*, <https://apnews.com/article/us-south-korea-japan-naval-exercise-north-korea-e04d3adef36799f6f31b3ba2643ff2fe>, January 17, 2024. Accessed on January 19, 2024.

⁷ Vann H. Van Dipen, "Third Successful Launch of North Korea's Hwasong-18 Solid ICBM Probably Marks Operational Deployment," *38 North*, December 21, 2023, <https://www.38north.org/2023/12/third-successful-launch-of-north-koreas-hwasong-18-solid-icbm-probably-marks-operational-deployment/>. Accessed on January 18, 2024.

⁸ Kim Tong-Hyung, "The US, South Korea and Japan conduct naval drills in a show of strength against North Korea," *The Associated Press*, <https://apnews.com/article/us-south-korea-japan-naval-exercise-north-korea-e04d3adef36799f6f31b3ba2643ff2fe>, January 17, 2024. Accessed on January 19, 2024.

⁹ Peter Suci, "Haeil-5-23 Nuclear Bomb Drone: North Korea's 'Sneak Attack' Weapon," *The National Interest*, January 19, 2024, <https://nationalinterest.org/blog/buzz/haeil-5-23-nuclear-bomb-drone-north-koreas-sneak-attack-weapon-208715>. Accessed on January 20, 2024

¹⁰ Hans M. Kristensen and Matt Korda, "North Korean nuclear weapons, 2022," *Bulletin of the Atomic Scientists*, Vol. 78, No. 5, p. 273.

¹¹ "Important Weapon Test and Firing Drill Conducted in DPRK," *KCNA Watch*, March 24, 2023, <https://kcnawatch.org/newstream/1679649659-306237598/important-weapon-test-and-firing-drill-conducted-in-dprk/>. Accessed on January 20, 2024.

¹² Ibid.

¹³ Ibid.

¹⁴ Vann H. Van Diepen, "North Korea's New "Unmanned Underwater Nuclear Attack Craft": Red October or White Elephant?" *38 North*, April 6, 2023, <https://www.38north.org/2023/04/north-koreas-new-unmanned-underwater-nuclear-attack-craft-red-october-or-white-elephant/>. Accessed on January 21, 2024.

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