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JANUARY 2022: MISSILE TESTS OF THE DPRK

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Except for the fourth nuclear test in 2016, January has traditionally been a calm month in the Democratic People's Republic of Korea (DPRK). However, a total of seven missile tests made January 2022 the busiest calendar month in the country's history of missile testing. The launch of a Hwasong-12 intermediate range ballistic missile on the 30th also marked the resumption of major weapons testing¹ after a four-year-long hiatus.

CONTENTS

I.	SHORT- AND MEDIUM-RANGE MISSILE TESTS.....	1
A.	5 January Hypersonic Missile Test	1
B.	11 January Hypersonic Missile Test	2
C.	14 January KN-23 Missile Test	2
D.	17 January KN-24 Missile Test	2
E.	25 January Cruise Missile Test	3
F.	27 January KN-23 Missile Test	4
II.	MAJOR WEAPONS TESTING RESUMPTION	5
A.	19 January Political Bureau Meeting.....	5
B.	30 January IRBM Test	5
III.	CONCLUSION.....	8
	ENDNOTES.....	9

I. SHORT- AND MEDIUM-RANGE MISSILE TESTS

Six short and medium-range missile tests were conducted by the DPRK in January 2022 (Figure 1). The 5 January and 11 January tests involved the development of a hypersonic glide vehicle. The 14 January and 27 January tests were conducted to examine the combat readiness of a rail-based missile regiment equipped with KN-23 ballistic missiles and the performance of an airburst warhead for the KN-23 ballistic missiles, respectively. The 17 January test aimed to examine the production quality of the KN-24 ballistic missiles. The 25 January cruise missile test involved two cruise missiles that had been improved on the basis of the cruise missiles tested in early September 2021.

A. 5 January Hypersonic Missile Test

During the 5 January test, a hypersonic glide vehicle (HGV), which was put on top of a rocket booster, reportedly flew at a top speed of Mach 6 and at an altitude of below 50 km.² The DPRK claimed that the missile hit a target 700 km away from the firing position after performing a turning maneuver “from the initial launch azimuth to the target azimuth.”³ ONN produced a brief on this test.⁴

The 5 January test seems to have been an initial test intended to experiment with the testing method ultimately used in the 11 January test (see Section I.B).



Figure 1. Short- and medium-range missile tests in January 2022. Range categorization for ballistic missiles does not apply to cruise missiles. However, for the sake of convenience cruise missiles are included in Section I.

Images: KCNA, KCTV

B. 11 January Hypersonic Missile Test

The 11 January test was a more advanced test based on the 5 January test. The missile reportedly increased its top speed from Mach 6 to Mach 10.⁵ The DPRK claimed that the HGV hit its target 1000 km away from the firing position after making a turning maneuver.⁶ The Japanese Ministry of Defense also suggested that the missile performed a turning maneuver.⁷ ONN produced a brief on the 11 January 2022 test.⁸

The turning maneuver seems to have been designed to decrease the speed of the HGV so that the HGV could reach a relatively high speed when its flight distance was limited. Without the turning maneuver, the HGV tested on 11 January would possibly have overflown Japanese territory.

Though the actual flight distances flown during the 5 and 11 January tests were not far, the HGVs were powered by IRBM and ICBM-class liquid-propellant engines.

C. 14 January KN-23 Missile Test

On 14 January, the DPRK launched two KN-23 ballistic missiles from a railway car.⁹ According to KCNA, the test was aimed at checking the alert posture of the railway-based missile regiment. The regiment reportedly launched the two missiles at around 2:50 PM (local time) after receiving the order in the morning.¹⁰ ONN has produced a brief on the rail-basing mode of the DPRK.¹¹

The Joint Chiefs of Staff of the Republic of Korea (ROK) announced that the missiles flew around 430 km, reaching a top altitude of 36 km and a top speed of around Mach 6.

This is the second time KN-23s have been launched from a railway car since the test on 15 September 2021.¹² Following the 15 September 2021 test, an official who oversaw the test reportedly instructed the regiment to be expanded into a “brigade” after operational experience had been accumulated.¹³ The 14 January 2022 test suggests that the DPRK has become more

satisfied with the rail-basing mode, as reflected in its reported plan to set up a proper rail-based missile operating system across the country.¹⁴

D. 17 January KN-24 Missile Test

On 17 January, the DPRK launched two KN-24 ballistic missiles. The official designation of the KN-24 was revealed at the October 2021 “Self-Defence 2021” weapons exhibition in Pyongyang as the “Hwasong-11Na” (화성포-11나; the letter “나” is the second letter in the Korean alphabet).¹⁵ However, State media still refers to it as a test of a “tactical guided missile”.¹⁶ According to the ROK, the missiles flew about 380 km at an altitude of 42 km and at a top speed of Mach 5.¹⁷

Official reports on the previous three KN-24 tests carried out between August 2019 and March 2020 emphasized research and development of this missile. In the report on the third test of the KN-24 (March 2020), the test was described as having reconfirmed the performance of the new weapon system before its delivery to the military.¹⁸

With respect to the 17 January 2022 test, DPRK State media made clear that the missiles had been selected from a production batch and that the test was aimed to confirm the performance of the KN-24s under production.¹⁹ This claim is consistent with three previous official reports and indicates that the process of developing the KN-24 from early flight tests to the production of initial batches has been completed.

In comparison, official reports on the KN-23 have never indicated the existence of a research and development phase. The first KN-23 launch on 5 May 2019 was part of a frontline joint military drill aimed at testing troop readiness. KCNA also indicated from the beginning that the KN-23 had been deployed and mastered by frontline military units. In April 2020, ONN published an analysis of the differences observed in the official narratives regarding the KN-23 and the KN-24.²⁰ The KCNA report on the 17 January 2022 test indicates that these differences continue to exist.

E. 25 January Cruise Missile Test

The DPRK has already developed and deployed anti-ship cruise missiles.²¹ In early September 2021, the DPRK tested cruise missiles, presumably to be used against fixed targets, with a reported range of 1500 km.²² ONN has produced a detailed brief about the cruise missiles tested in early September 2021.²³ In early October 2021, another type of cruise missile was revealed at the “Self-Defence 2021” weapons exhibition referred to above.²⁴

According to the ROK, the DPRK launched two cruise missiles on 25 January 2022.²⁵ On 28 January, KCNA reported that the 25 January test had been a “test-fire for updating the long-range cruise missile system”. According to photos released by KCNA, the recently tested cruise missile is

identical to the one that was first revealed at the “Self-Defence 2021” weapons exhibition. Thus, it is possible that the newly tested cruise missile and the cruise missile revealed at the weapons exhibition belong to an updated version of the cruise missile tested in early September 2021 (Figure 2).

According to KCNA, the cruise missiles tested on 25 January flew for 9137 seconds and hit the target island 1,800 km away,²⁶ which means the missiles flew about 197 m/s, or roughly 0.58 Mach. The average speed of the cruise missiles tested in early September 2021 was 0.59 Mach.²⁷

According to Yonhap News Agency, a military official from the ROK said with respect to the 25 January test that: “... should such a missile be launched southward, our detection and interception systems have no problem countering it.”²⁸

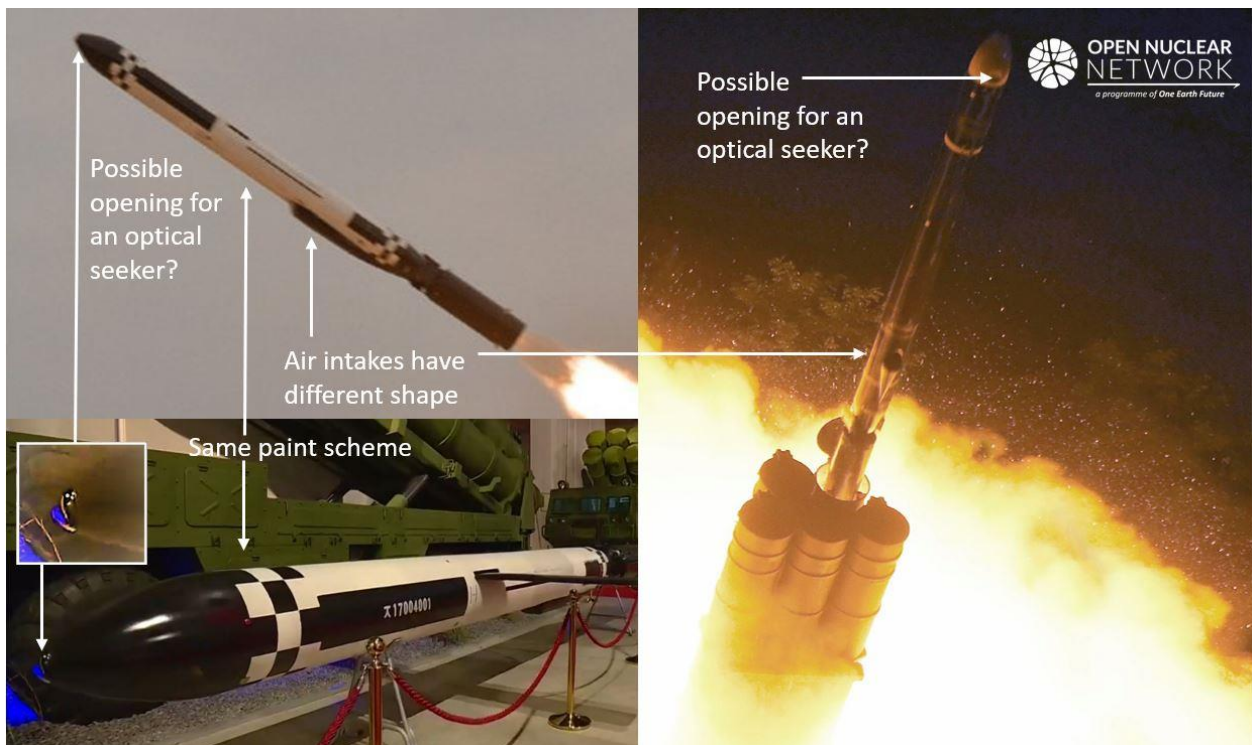


Figure 2. Cruise missile tested on 25 January (top left). Cruise missile revealed at the “Self-Defence 2021” weapons exhibition (bottom left). Cruise missile tested early September 2021 (right).

Images: KCNA, KCTV

F. 27 January KN-23 Missile Test

On 27 January, the ROK said it had detected the launches of “two apparent short-range ballistic missiles” from the DPRK. The missiles reportedly flew about 190 km at a top altitude of 20 km.²⁹

On 28 January, DPRK State media reported that a conventional warhead developed by the Missile Warhead Institute under the Academy of Defence Science had been tested on 27 January.³⁰ Photos released by KCNA suggest that airburst warheads had been placed on what appeared to be KN-23 ballistic missiles (Figure 3).

The advantage of airburst warheads is that, compared with ground burst, the energy of the explosion can be distributed evenly over a larger area.³¹

DPRK State media also reported on 28 January that Kim Jong Un had visited a munitions factory (without specifying the date).³² Still frames taken from KCTV video suggest that this factory is involved in the production of metal casings for solid-propellant motors (Figure 4). The factory is also suspected to be the February 11 Plant of Ryongsong Machine Complex in Hanhung,³³ an area where the 27 January 2022 test took place.



Figure 4. Kim Jong Un inspects unfinished metal casings for solid-propellant motors.
Image: KCTV

II. MAJOR WEAPONS TESTING RESUMPTION

The 30 January 2022 testing of an intermediate-range ballistic missile (IRBM) marks the likely resumption of major weapons testing by the DPRK. The DPRK had, until the 30 January test, refrained from launching any IRBMs and ICBMs since the test flight of a Hwasong-15 ICBM in November 2017.

Commenting on the 30 January test, ROK President Moon Jae-in said that the DPRK had “moved closer” to scrapping its self-imposed moratorium on testing nuclear weapons and ICBMs.³⁴ While there could be different interpretations as to whether IRBMs were subject to the moratorium,³⁵ the 30 January 2022 test could be seen as the first step of a series of possible actions following the orders given by the Political Bureau on 19 January 2022 to examine the issue of restarting all temporarily-suspended activities.

A. 19 January Political Bureau Meeting

On 19 January 2022, the Political Bureau of the Central Committee of the Workers' Party of Korea (WPK) held its 6th Meeting of the 8th Central Committee. During this meeting, the DPRK leadership hinted at the resumption of major weapons testing:

The meeting of the Political Bureau reassigned the policy tasks for the national defence to immediately bolster more powerful physical means which can efficiently control the hostile moves of the U.S. against the DPRK getting ever more serious day by day. It gave an instruction to a sector concerned to reconsider in an overall scale the trust-building measures that we took on our own initiative on a preferential ground and to promptly examine the issue of restarting all temporarily-suspended activities.³⁶

According to the KCNA report, the reason for reconsidering the “restarting all temporarily-suspended activities” was that the US hostile policy against the DPRK had not changed. In a possible response to the new US sanctions

announced on 12 January 2022,³⁷ KCNA accused the Biden administration of persisting in “maneuvers to deprive the DPRK of its right to self-defence.”

This is not the first time the DPRK has hinted at the possible resumption of major weapons testing. In early December 2019, KCNA reported that two strategic weapon-related tests had been conducted at the Sohae Satellite Launching Ground, and that the tests were to “have an important effect on changing the strategic position of the DPRK once again in the near future”³⁸ and “further bolstering up the reliable strategic nuclear deterrent” of the State.³⁹ During the 5th Plenary Meeting of the 7th Central Committee of the WPK, held from 28 to 31 December 2019, Kim Jong Un was indirectly quoted as having said that “there was no ground for the DPRK to get unilaterally bound to the commitment any longer, the commitment to which there was no opposite party.” In addition, during the same meeting, Kim Jong Un reportedly also said that “the world will witness a new strategic weapon to be possessed by the DPRK in the near future.”⁴⁰ During the DPRK’s October 2020 military parade, a large ICBM, possibly referred to as Hwasong-17,⁴¹ was revealed to the public for the first time.⁴²

B. 30 January IRBM Test

On 30 January, the DPRK launched an IRBM in a highly lofted trajectory from Jagang Province. Both Japan and the ROK stated that the missile had reached an altitude of 2000 km and a flight distance of 800 km.⁴³ The ROK also stated that the missile had reached a top speed of Mach 16.⁴⁴ By way of comparison, a missile flying at such a speed in a normal trajectory with the same payload could reach a range of over 4000 km.⁴⁵

On 31 January 2022, the DPRK confirmed that an “evaluation test” of the Hwasong-12 IRBM had been conducted on 30 January under the plan of the Academy of Defence Science, the Second Economy Commission and other institutions (Figure 5).⁴⁶

Similar to the 17 January 2022 KN-24 test, DPRK State media also emphasized that the missile had been selected from a production batch and was tested in order to verify the accuracy, safety and operation effectiveness of the missile under production and deployment.⁴⁷

This is the ninth consecutive launch of ballistic missiles powered by a Hwasong-12 engine (Figure 6). The string of apparent successes is likely to strengthen the DPRK's confidence in the reliability of its ICBMs, such as the Hwasong-14 (Figure 6) and the Hwasong-15 (only flight tested once), as the engines powering those missiles are variations on the same design.⁴⁸ The yet to be flight tested large

ICBM, which was first revealed during the 10 October 2020 parade, is also possibly powered by a pair of such engines.⁴⁹

The DPRK seems to have attempted to downplay or normalize the launch of an IRBM-class ballistic missile, given that Kim Jong Un was not reported to be present at the test and the news of the test only appeared on page three of the *Rodong Sinmun*, the daily newspaper of the WPK. It is possible that, in the future, Kim Jong Un would make his presence at such an event known to the outside world only when a milestone achievement is made for the core tasks of national defence capability buildup (see Section III).



Figure 5. Hwasong-12 launched on 30 January 2022 (top). Camera view of the earth from the warhead (bottom). The images sent back to earth are proof that remote telemetry was working during the test. Images: *Rodong Sinmun*



Figure 6: launches of ballistic missiles powered by a Hwasong-12 engine.
 Images: KCNA

III. CONCLUSION

In connection with the 11 January 2022 missile test, Kim Jong Un reportedly said that developing hypersonic weapons was one of the “five core tasks of the five-year plan for building up the national defence capability” set forth at the 8th Congress of the Workers’ Party of Korea earlier in January 2021.⁵⁰ There is no official list of the “five core tasks.” However, the “core plan and strategic tasks in developing and strengthening national defence industry”, as referred to in a KCNA report on the 8th Party Congress,⁵¹ can be summarized as follows (see Attachment for extract from the KCNA report):

1. producing tactical nuclear warheads and large, high yield nuclear warheads;
2. raising strategic striking distance up to 15000 km;
3. developing and deploying HGVs within a short time;
4. developing ground and sea-based solid-propellant ballistic missiles of intercontinental range; and
5. possessing nuclear-powered submarines and an underwater-launched nuclear strategic weapon.

The same KCNA report also referred to the need to operate a military reconnaissance satellite in the near future.⁵² Putting a satellite into orbit would involve the launch of a carrier rocket that shares technologies with ballistic missiles. The last satellite launch of the DPRK took place on 7 February 2016.

Taking all the other indicators into account, the missile activities in January 2022 suggest that (1) the DPRK will continue to advance its regional strike capabilities in Northeast Asia and (2) the DPRK will attempt to complete the core plan and strategic tasks referred to above during the 2021-2015 period.

In light of the above, the resumption of ICBM and/or nuclear tests is becoming increasingly likely.

Attachment - Excerpt from KCNA report on “Report Made by Supreme Leader Kim Jong Un at Eighth Congress of WPK”, 10 January 2021

The report mentioned the core plan and strategic tasks of crucial importance in rapidly developing and strengthening the national defence industry.

It is necessary to develop the nuclear technology to a higher level and make nuclear weapons smaller and lighter for more tactical uses. This will make it possible to develop tactical nuclear weapons to be used as various means according to the purposes of operational duty and targets of strike in modern warfare, and continuously push ahead with the production of super-sized nuclear warheads. In this way we will be able to thoroughly contain, control and handle on our own initiative various military threats on the Korean peninsula, which are inevitably accompanied the nuclear threat.

The report also set a goal of attaining an advanced capability for making a preemptive and retaliatory nuclear strike by further raising the rate of precision good enough to strike and annihilate any strategic targets within a range of 15 000 kilometres with pinpoint accuracy.

And the tasks were brought up to develop and introduce hypersonic gliding flight warheads in a short period, push ahead with the development of solid-fuel engine-propelled inter-continental underwater and ground ballistic rockets as scheduled, and possess a nuclear-powered submarine and an underwater-launch nuclear strategic weapon which will be of great importance in raising the long-range nuclear striking capability.

The report also referred to the need to secure the ability of reconnaissance and information gathering based on operation of a military reconnaissance satellite in the near future, and conduct in real earnest the most important research to develop reconnaissance drones and other means of reconnaissance capable of precisely reconnoitring up to 500 km deep into the front.

ENDNOTES

- 1 For purposes of this analysis, major weapon testing is defined as the testing of nuclear weapons, intermediate-range ballistic missiles (IRBMs) and intercontinental ballistic missiles (ICBMs). At the 3rd Plenary of the 7th Central Committee in April 2018, Kim Jong Un reportedly said that: "Given the scientific and orderly implementation of the whole process of the nuclear arms programme ... we see no point in conducting any nuclear tests and test launches of intermediate and intercontinental ballistic missiles anymore..." See: *Chairman Kim Jong Un presides over Party plenary meeting, sets forth new strategic line*, KCNA, 21 April 2018. On 8 May 2019, a spokesperson from the DPRK's delegation to the north-south general-level military talks was quoted as saying that: "...the U.S. and Japan as well as the international community said that the recent strike drill was not "breach of the promise" as the firing of the intermediate-and long-range missile and the ICBM was not involved in it." See: *S. Korean Military Authorities Urged to Stop Nonsense*, KCNA, 8 May, 2019. In late July 2019, then-US Secretary of State Mike Pompeo said that Kim Jong Un had promised then-US President Trump that he would refrain from testing nuclear weapons, IRBMs and ICBMs. See: *N Korea's Kim says new missile launch was warning to South Korea*, Aljazeera, 26 July 2019, available at: <https://www.com/news/2019/7/26/n-koreas-kim-says-new-missile-launch-was-warning-to-south-korea>
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One Earth Future's Open Nuclear Network programme is a non-aligned, non-governmental entity that seeks to increase security for all States by ensuring that nuclear decision makers have access to high quality, shareable open source information which enables them to make the best decisions in the face of escalating conflict.

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