ADEX, Nuri and Other Missile News from the South of the Korean Peninsula

While the world was discussing the DPRK's SLBM, a lot was going on south of the 38th parallel.

On September 15, South Korea successfully launched a locally produced ballistic missile (SLBM) from a submarine, becoming the seventh country in the world to do so.

On September 28, Hyundai Heavy Industries' Ulsan shipyard held a launching ceremony for a diesel submarine named after a prominent Korean independence fighter, Sin Chaeho. It is the third of three Changbogo-III series submarines built using proprietary technology as part of a 3 trillion won ($2.7 billion) project launched in 2007. The lead vessel, Dosan Ahn Changho, was launched in 2018 and entered service last month. The second, the Ahn Mu, was launched last November and is expected to enter service next year.

The 83.5m long and 9.6m wide submarine is served by a crew of 50. It carries six submarine-launched ballistic missiles (SLBMs) and can navigate autonomously for up to 20 days. About 76% of its parts are locally produced, allowing for timely maintenance and other technological support.

The 2021 Seoul International Aerospace and Defense Industry Exhibition (ADEX 2021) was held in Seongnam, Gyeonggi-do Province, October 19-23. It was attended by 440 companies from 28 countries, including 171 from abroad. It is the greatest number of participants since the beginning of these exhibitions in 1996. The exhibits
include K-2 tanks, K-9 Thunder Self-Propelled Howitzers, large hydrogen-powered drones developed by LIG Nex1 to carry 200 kilograms of cargo, virtual reality-based training systems, laser weapon systems, multi-purpose unmanned vehicles, and dozens of military aircraft such as FA-50 Light Combat Aircraft and KT-1 Basic Trainer.

The F-35A stealth fighter jet produced by Lockheed Martin was presented to the general public for the first time. Boeing introduced the AH-64E Apache helicopter and MV-22 vertical takeoff and landing transport aircraft. Korea Aerospace Industries exhibited a size-life model of the first domestic KF-X fighter jet, which is currently under development. General Atomics Aeronautical Systems unveiled the MQ-1C Gray Eagle unmanned aircraft system. It is capable of high-resolution surveillance and carries four air-to-ground missiles.

On the same day, October 19, the Agency for Defense Development (ADD) of the ROK announced that it would take a course to improve the accuracy and power of submarine-launched ballistic missiles. According to Park Jong-seung, head of the Agency for Defense Development, South Korea's missile has very high accuracy, a factor in deterring threats from the DPRK and other countries, as North Korean SLBM launches cannot be considered a complete success.

ROK President Moon Jae-in flew to the exhibition with his wife and aboard the first national FA-50 light combat aircraft. Speaking at the October 20 opening ceremony, Moon pointed out that "the essence of improving the country's defense capabilities is the pursuit of peace."

It is worth noting that Moon Jae-in visited the ADEX for the first time in four years.

In his speech, Moon Jae-in noted the importance of developing the ROK's defense industry to protect the country's residents. According to the South Korean President, this is a crucial strategic industry with high growth potential related to security and civil sectors. He said the authorities had worked to eradicate corruption in the defense industry and promote the top 100 goals for its development. Investments in this area have been markedly increased. As a result, the ROK ranked sixth in the world in terms of defense exports. Moon Jae-in stressed that the ROK is "no longer in a catch-up role. It is time to assume a leadership role of the future." He also noted that by 2026, state support for the local manufacturing of parts would be quadrupled.

During his speech, Moon stressed the importance of South Korea's recent development of the KF-21 Boramae fighter aircraft and the Nuri-ho space launch vehicle (KSLV-II), which he advertised as the latest results of the country's efforts to improve its defense technology. This missile is worth talking about in more detail. So far, launch vehicles and intercontinental ballistic missiles use much of the same technology. Still, the difference is whether they carry a satellite or a warhead.

Nuri-ho is a three-stage rocket 47.2 m long, 3 m in diameter, weighing 200 tons, capable of launching a satellite weighing 1.5 tons to an altitude of 600-800 km. The three-stage rocket uses four 75-ton liquid engines in its first stage, a 75-ton liquid engine in the second stage, and a 7-ton liquid engine in the third stage. The rocket is the result of the work of South Korean scientists. The South Korean government has invested nearly 2 trillion won ($1.8 billion) over 12 years in the launch vehicle project. Almost 500 employees from just under 300 national companies were involved in the endeavor. Specifically, Hanwha Aerospace led the development of liquid rocket engines, while Korea Aerospace Industries (KAI) and Doowon Heavy Industrial participated in developing the outer structure of the rocket. Hyundai Heavy Industries developed the mobile launch platform.

The first launching of a single-stage solid-propellant rocket "for scientific observation" took place on June 4, 1993. A two-stage rocket was launched on July 9, 1997. South Korea launched an independent liquid fuel science rocket on November 18, 2002. However, in August 2002, South Korea and Russia confirmed plans to develop the Korea Space Launch Vehicle-I (KSLV-I), which was scheduled for launch in 2005 but has been postponed several times: August 19, 2009, South Korea stopped the KSLV-I countdown less than eight minutes before launch due to problems in the high-pressure tank. August 25, 2009, the South Korean space launch vehicle KSLV-I was successfully launched, but the science satellite could not be put into orbit. An independent commission later confirmed that the cause of the failure was a defect in the fairing assembly. On June 10, 2010, South Korea launched the space launch vehicle KSLV-I for the second time, but it exploded 137.19 seconds after having taken off, and a successful launch did not take place until January 30, 2013.

However, the first stage of the rocket was built in Russia, after which it was decided to build an entirely homemade rocket.

July 2021 saw the successful testing of a new solid-propellant engine for space rockets. The testing came a year after
Seoul and Washington agreed to lift restrictions on South Korea's use of solid fuel for space rocket launches.

The launch took place on October 21 from the Naro Space Center in South Jeolla's Goheung County, was broadcast live on YouTube and Naver TV, and was accompanied by headlines like "a great moment for the Korean people! South Korea became the seventh country in the world to develop and successfully launch a space launch vehicle!" "Israel, Iran, and North Korea have also launched their rockets in the past but could not become a space power. If Korea achieves another feat next year, it can enter the space race amid the contest between the United States and China."

The rocket took off normally but, just as in 2009, the payload dummy weighing 1.5 tons could not be thrown into orbit. Lim Hyesook, Minister of Science and ICT, said that the dummy's speed after separation from the rocket head part was insufficient to reach the near-Earth orbit. A special expert group will investigate the causes of the malfunction.

Commenting on the launch, South Korean President Moon Jae-in called it "a very creditable achievement" (after all it did not explode during the launch before the reporters!!). Moon praised the scientists and engineers.

Nevertheless, the ambitious plans are still on the agenda. The rocket is expected to launch a 200-kilogram satellite into a low orbit at an altitude of 600 to 800 kilometers on May 19, 2022. It is scheduled to launch four more Nuri-ho rockets in December 2022, as well as in 2024, 2026, and 2027 to refine the technology and improve the reliability of rocket systems. Starting from the third launch, the rocket is planned to place next-generation miniature satellites into orbit to participate in global space research projects.

By 2024, the ROK plans to develop and launch a domestic solid-propellant space rocket, and by 2030 it plans to send a space probe to the Moon. According to Moon Jae-in, "a country that leads in space exploration will lead in the future. The government will invest in the long term so that Korea can become a space power."

The scientists believe that the probability of success of newly developed rockets on the first attempt is currently 30%. To Seoul's comfort, it may be recalled that the first steps of Pyongyang's missile program were not successful either, although, unlike Seoul, they were the subject of more jokes. And of the 11 countries that have launched launch vehicles, only Russia, France, Israel, and North Korea have successfully placed their satellites into orbit on the first attempt. The US-manufactured Vanguard and Atlas and European models of the Europa and Ariane launch vehicles failed at launch, and Japan's first spacecraft, Lambda 4S, failed on its first four attempts in the 1960s.

But back to the political implications of the launch. The Blue House is trying to prove that the launch vehicle is not an ICBM, quoting essentially the same arguments that the DPRK used years ago. The military launch is different because it tests both the ability to take off and the accuracy of hitting, plus the missile runs on liquid fuel. "This means that it takes a long time to refuel, so it is incorrect to say that a missile could be the basis for an ICBM." On the other hand, the main types of intercontinental missiles of the North are also liquid-propelled.

In this context, the Korea Times notes "fears that the move could encourage North Korea to develop and test more advanced intercontinental ballistic missiles (ICBMs) while claiming that it seeks a balance of power on the Korean Peninsula." Japan's Yomiuri Shimbun also believes that South Korea's missile development could be an excuse for North Korea to create more weapons, including ICBMs. Even the BBC mentioned a possible arms race on the Korean Peninsula in its report on the Nuri-ho launch.

As of October 25, South Korea's military has not detected any unusual military action by North Korea that appears to be in response to the recent launch of KSLV-II. However, we remember Pyongyang's constant demands to abandon double standard as allies characterize its missile activities as provocations while justifying their own as deterrence, and therefore it is possible that the missile race on the Korean Peninsula could continue.

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