



The South Korean Rocket: Reality and Regional Reach

military-Earth thinking notebook

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On April 16, 2009, just a few days after the launch of a North Korean Unha-2 rocket supposedly carrying a communications satellite, the main page of the website of the South Korean progressive-oriented daily "Hankyoreh" showed a photo entitled "The North Korean rocket Unha-2": "Preparations for South Korea's first space rocket at the Naro Space Center in South Jeolla Province on April 15. South Korea is planning an orbital flight in July 2009". This soberly commented picture comes in a special context. The United Nations Security Council has just condemned North Korea's April 5 rocket launch as a ballistic missile test, and North Korea has reiterated that the launch is not a ballistic missile test. North Korea announced on 15 April that it was withdrawing from nuclear disarmament talks and that it would rehabilitate its nuclear research facilities that were being dismantled. The publicity in Seoul about the South Korean rocket and the launch that finally took place on 25 August 2009 is therefore not entirely harmless. In any case, it raises the question of the meaning of this programme for South Korea and its neighbours.

Ambitious, the South Korean space launcher programme dates back only a few years but has now been given concrete form by the half-success of a first launch, which makes it necessary to evaluate its significance in its regional geopolitical context, especially in the context of the confrontation with Pyongyang.

A recent programme, based on Russian expertise

The history of the South Korean rocket is short. It has its origins in the "Korean Sounding Rocket" (KSR) sounding rocket programme, which was built entirely domestically and launched in 1990 by the Korean Aerospace Research Institute (KARI), founded the previous year. The aim of this programme is to develop a space vehicle launcher capable of placing a satellite weighing about 100 kg in orbit. However, difficulties in the development of liquid-fuelled thrusters led to its abandonment in 2005 in favour of the

Korean Space Launch Vehicle-1 (KSLV-1), a system equipped with thrusters from the future Russian Angara space launcher, as the United States did not consider it appropriate to provide technical support for this programme. Moreover, Russian aid could only be obtained because the purchase of some ten thrusters by Korea provided the "Centre for Space Research and Production" in Khrunichev with the financial resources it lacked in its budget to develop its Angara heavy launcher [1]. Despite Korea's entry into the Missile Technology Non-Proliferation Regime [2] in 2001, technology transfer issues delayed this agreement until June 2007, with Russia finally obtaining no transfers.

In concrete terms, the rocket that takes off on 25 August 2009 is therefore based on a first stage with liquid fuel designed entirely by the Khrunichev centre, in Khrunichev, Russia, a second solid fuel stage of Korean design, as well as a third stage consisting of a scientific satellite, also of Korean manufacture. According to the KARI, it was a failure to eject part of the fairing of this satellite after the separation of the first and second stages that caused the additional mass represented by this element prevented the satellite from aligning itself correctly with its orbit at an altitude of 300 km. Incidentally, KARI's statements following that incident highlight the important responsibilities entrusted to Russian technicians, not only in the manufacture of the first stage of the rocket, but also with regard to the general control of the project and its technical coherence.

In the short term, a second launch is planned for spring 2010, while from 2018 onwards KSLV-2 and KSLV-3 should be 100% domestic-built launchers capable of placing satellites of one tonne and over in orbit. Nevertheless, these projects are closely dependent on the ability of Korean scientific research to acquire the necessary skills, a capacity that is itself closely linked to the degree of control that Russian technicians have over the process, since Russia wishes to transfer as little technology as possible. More concrete objectives are also mentioned, such as the ability to replace the 10 Korean satellites currently in orbit, which would require the sending of one satellite a year in the next few years, or the safe deployment of satellites dedicated entirely to intelligence.

As the US State Department spokesman said on 18 August 2009, "The South Koreans have developed their space programme in a very transparent manner, in accordance with the international agreements they have signed. This is in stark contrast to the example set by North Korea, which has failed to meet its international commitments" [3]. [3] North Korea had suggested at the time that the launch of KSLV-1 should be subject to a Security Council sanction, in the same way that the launch test of its Unha-2 rocket was sanctioned in April of the same year. Justified or not, this request shows that, beyond the status of the KSLV programme and its announced prospects, it is necessary to take into account its significance outside South Korea.

What may be the significance of this space programme in the regional geopolitical context?

First of all, it must be admitted that drawing a parallel between certain aspects of the South and North Korean "satellite launcher" projects is not entirely artificial. For example, the two rockets are similar in terms of dimensions: 33.5 metres long and weighing 140 tonnes for the KSLV-1, compared with the estimated dimensions of 32 metres long and 85 tonnes for the rocket called Unha-2 by North Korea. Both are theoretically capable of placing a 100-kg satellite into low orbit, so they are most likely to have comparable performance, with some power advantage for the KSLV-1. Secondly, both rockets are based on an architecture of Russian origin. The first stage of the Unha-2 / Taepodong 2C launcher is in fact an evolution of the North Korean Nodong-1 intermediate-range liquid-fuelled ballistic missile, itself a copy of the Russian Scud-B, while the second stage is said to be derived from the Scud-C, apparently without Russian assistance. Moreover, in

February 2009, as preparations for the North Korean launch became clearer, the South Korean foreign minister himself stated that "in terms of technology, it is difficult to distinguish a missile from a satellite launcher" [4]. 4) Indeed, since it takes slightly more power and accuracy to place a satellite in low earth orbit than it does to launch a ballistic missile on an intercontinental trajectory, the technological ability to do one usually induces the other, an argument that may well backfire on the South Korean KSLV-1.

Moreover, as seen from Pyongyang, there are a number of worrying signs that cast doubt on the uniquely peaceful nature of the South Korean launcher. First of all, North Korea presents its launches in 1998 and April 2009 as two successful launches of telecommunications satellites into orbit (even if no object or radio transmission is present). The vast majority of the international community sees this as an attempt to conceal two tests of Taepodong intercontinental ballistic missiles. It therefore seems quite natural for Pyongyang to view the South Korean space project as a cover for a military programme. Moreover, immediately after the North Korean launch in April 2009, the South Korean Defence Minister reaffirmed the need for Seoul to renegotiate with the United States the agreement that limits the range of the South Korean Army's missiles to 300 km, regretting that such a limit would, for example, put Musudan-ri, the North Korean launch site, largely out of reach. An orbital-capable ballistic delivery vehicle would theoretically solve this range problem, even if the cost of delivering a hundred kilos of explosive would obviously be prohibitive. Second, the ongoing negotiations between the United States and South Korea for "extended deterrence" [5] cannot have escaped Pyongyang's notice. These talks are concerned with the possible equipping of South Korean aircraft, submarines and delivery vehicles with US-supplied nuclear weapons, along the lines of the system set up in some European countries within the framework of NATO. Finally, South Korea is preparing to obtain greater autonomy in the use of its forces following the transfer of wartime command responsibility for its troops from the US Army to the Korean Army in 2012. All these indications probably make credible for Pyongyang the possibility of the eventual emergence of a South Korea supported by a deterrent with strategic vectors.

However, in the regional context outside the peninsula, the South Korean launcher is probably not seen in this military aspect, but rather as a marker of power and technological development characteristic of all the major players in the region: Russia, the United States, China (with the Long March rocket) and Japan (with the H-II launchers, capable of refuelling the International Space Station since September 2009). Moreover, with regard to these powers, none of which has an interest in the appearance in East Asia of a new country possessing extra-atmospheric vectors, a certain restraint is necessary and Seoul can reasonably only limit itself to technological demonstrations. Largely dependent on Russian assistance, provided without technology transfer for fear of ballistic proliferation, Korea is in fact still far from posing even a commercial threat to Russian satellite launchers or future Japanese commercial launchers.

The semi-successful launch of the KSLV-1 on 25 August this year heralds the maturity of a recent South Korean space programme. In the current state of tension with North Korea, this launch can only appear to Pyongyang as a veiled retaliation or even the start of an arms race, while at the regional level the South Korean launcher is only a modest competitor in the space field. Ultimately, this programme could have essentially symbolic value for South Korean opinion and for the North-South head-to-head. A successful satellite launch could send the message that, in this and other areas, Pyongyang may be concentrating a lot of resources and spreading out in threatening diplomatic gestures, but South Korea is superior to it.

1) Designed to put 25-ton satellites into low earth orbit; its first launch is scheduled for 2010.

2) Created in 1987 by Canada, France, Germany, Italy, Japan, the United Kingdom and the United States, it currently has 34 member countries and its main objective is the non-proliferation of weapons of mass destruction.

3) Excerpt from a press conference quoted by the "Global security.org" website, 2 September 2009.

4) According to a report by the South Korean news agency Yonhap on 18 February 2009.

5) According to a report in the Korean newspaper Chosun Ilbo on the 41st South Korea/US security consultative meeting on 22 October 2009.

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