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Priorities of Military and Technical Cooperation between Belarus and Russia

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Summary

Western sanctions are encouraging Minsk and Moscow to pursue a more extensive bilateral military and technical cooperation.

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Russian Defence Minister Sergei Shoigu said on 7 February 2023 that a satellite all-weather earth remote sensing (ERS) system would be created to serve the ministry’s goals. The project may have been triggered by battlefield developments in Ukraine, which demonstrated that Russia was lagging behind the U.S. miserably in terms of satellite surveillance. From the technical point of view, the system will constitute a constellation of ERS satellites of various purposes. Some are designed to monitor the earth’s surface in the visible spectrum, while others will operate in the infrared range or use radar detection. The projected satellite constellation will presumably close the ERS capability gap and enhance the efficiency of the Russian troops on the battlefield.

Space developments

However, the lack of domestic facilities to manufacture requisite hardware for space vehicles may turn into the main obstacle to the implementation of this concept. Back in Soviet times, this sort of equipment was produced in several republics. After the disintegration of the USSR, only Belarus has managed to retain the relevant technology. Therefore, when Russia resumed its ERS endeavour a couple of years ago, Russian specialist organisations and factories turned to Belarusian enterprises for help for a good reason.

On 2 August 2021, a working meeting was held in Moscow between Dmitry Rogozin, the then CEO of the state corporation *Roscosmos*, Uladzimir Husakou, the chairman of the National Academy of Sciences of Belarus, and Uladzimir Siamashka, the then Belarus's ambassador to Russia. The meeting focused on "relevant matters of Russia–Belarus cooperation in space." Specifically, the participants addressed cooperation in manned space exploration and joint ERS projects. The meeting was held in the follow-up of the agreements reached by Rogozin and Aliaksandr Lukashenka back on 21 January 2020, when joint Belarus–Russia space technology projects were discussed, and a decision was taken to commence "large-scale cooperation." According to Rogozin, whereas previously Russian integrated structures were in talks over a potential purchase of Belarusian companies (which was eventually found to be impractical), now negotiations mostly focused on "combining assets within the framework of joint ventures and integrated structures", rather than mutual acquisitions of such assets.

Rogozin's insistence can easily be attributed to the difficulties that the Russian space industry has faced because of the shortage of electronics. The official confirmed this in June 2021. According to Rogozin, the U.S.' sanctions that limited supplies of microelectronics to Russia frustrated the launch of a number of satellites: "one particular chip may be missing in one or another, or a third one."

> After 24 February 2022, these problems escalated many times. The result is that the capacity of Belarusian scientific institutions and factories became increasingly appealing to Russian space technology manufacturers.

Peleng (optoelectronic equipment) and *Integral* (electronic component base) are viewed among *Roscosmos*'s principal partners. There is obviously a need to clarify how these two can be of use to Russian allies.

JSC Peleng

Peleng specialises in micro-batch and one-off manufacture of high technology optomechanical and optoelectronic products for various applications, including space vehicles. The company has developed and manufactured optoelectronic hardware for ERS satellites and video processing, compression, and storage solutions for ERS systems since the Soviet times.

It is only natural that JSC *Peleng* supplied equipment for first Belarusian remote sensing satellite *BelKA*, which, together with its Russian counterpart *Kanopus-V*, was launched on 22 July 2012. The Belarusian company had developed an optoelectronic telescopic

system for both satellites, ensuring 2-meter resolution from a height of 550 kilometres at a 45-degree view angle.

The joint ERS satellite constellation consists of one Belarusian and six Russian *Kanopus* satellites, all of which are using *Peleng*-made on-board equipment. According to official statements, the main consumers of images provided by these satellites are nature protection, forestry, and agricultural agencies, as well as the two countries' ministries for emergency situations. However, some experts believe that space images taken by the ERS satellites are also used for military purposes: for reconnaissance and making of digital electronic maps used to guide high-precision ground and airborne weapons. These include the X-555 and X-101 cruise missiles that arm the Tu-95MS and Tu-160 strategic bombers.

> Regardless of their departmental subordination, customers are undoubtedly interested in increasing the resolution characteristics of the optoelectronic equipment of the ERS satellites.

Specialists at JSC *Peleng* respond to their requirements by working actively to create optical facilities with resolution capacity of up to 30 centimetres, which corresponds to the current global standard. Apparently, the new constellation of ERS satellites for the Russian Defence Ministry will be equipped with such systems.

Peleng's equally significant specialisations include:

- Creation of state-of-the-art sighting solutions for fire control systems installed in production and advanced models of Russian tanks and armoured vehicles;
- Development of unique software application suites ensuring control of radar and laser-optical missile defence systems, as well as missile warning stations.

JSC Integral

JSC *Integral* acts as JSC *Peleng*'s partner in many projects. For example, it is involved in the development of photoelectric detectors. However, Russian customers' interest in the Belarusian microelectronics manufacturer is not limited to its participation in the development of ERS equipment. One of the main modern-day challenges to the Russian space industry (and defence industry, too) is its marked dependence on foreign electronic components. Any more or less state-of-the-art research and military equipment produced in Russia currently relies on imports.

In the 1990s, Russia's chief manufacturers of electronic components, *Mikron* and *Angstrem*, lost many of their key competencies. Therefore, in the post-Soviet period, the Russian space and military-industrial complex has met most of its requirement for electronic components by purchasing them from Western countries. Once they imposed an embargo on deliveries of military and space electronic components to Moscow at the insistence of the U.S., the Russian strategic industries found themselves in an extremely difficult situation.

Space and military-grade electronic components are supposed to meet stringent requirements, primarily resistance to special external exposure: vibration, overloads, and space radiation, strong electromagnetic fields, high and low temperatures. If a chip is created specifically for space use, one of the main requirements is the stability of its parameters as it gradually accumulates radiation and survival after it encounters heavy ions of space radiation. Military-grade products must offer high resistance to nuclear effects, this being one of defining factors.

> Even for technologically advanced states organising their own production of electronic components with such characteristics from scratch is a formidable challenge, which calls for not only a great deal of investment and time, but also, and most importantly, corresponding necessary competencies.

Anticipating a possible embargo imposed by Western countries on supplies of space and military electronic components, the Russian government adopted back in 2007 a federal program, entitled *Development of Electronic Component Base and Radioelectronics for 2008–2015*. Judging by further developments, its goals (substitution for foreign electronic components) were not achieved. This is confirmed by recently published reports of extensive use of imported electronic components in the inertial navigation systems of *Iskander* and *Kinzhal* missiles, as well as of other Russian armaments and special equipment, namely, 133 variations of electronic components, most of them produced by the U.S. company *Analog Device*, a global leader in the design and manufacturing of analog, mixed signal, and DSP integrated circuits.

Under the circumstances, Minsk-based I*ntegral*, which has produced integrated circuits for space and defence industry since the Soviet times, has become a viable alternative to many Western electronics products. For example, it developed and produced integrated circuits ensuring special radiation resistance for the first Soviet moon rover in the late 1960s and made electronic units for the *Energia-Buran* space shuttle in the mid-1980s.

After the collapse of the Soviet Union, the company managed to retain its competencies required for the production of space and military electronic components. Back in 2005, it developed a very large-scale integrated (VLSI) circuit for optical equipment produced by JSC *Peleng* for ERS satellites, which makes it possible to identify objects up to two metres in size on the Earth's surface. Currently, *Integral* is working on VLSI circuits for higher resolution optical systems. The company's product mix includes 2,500 types of integrated circuits and semiconductors, 200 types of LCDs and modules, and 150 electronic products.

"Belarus has preserved important competencies"

The Russian side also keeps an eye on JSC *Planar* products. In many respects, the company is the only FSU manufacturer of special technologies (optomechanical, assembly, control and measuring tools, etc.) and supplies its make to microelectronic and radioelectronic production facilities both in Belarus (specifically, JSC *Integral*) and to a number of consumers in the CIS and beyond it. These include Russia (which accounts for 70% of the total output), Germany, China, Italy, Republic of Korea, Israel, Taiwan, and the U.S.

Vladimir Putin's numerous statements attest to the crucial importance of these and many more Belarusian manufacturers for Russia amid sanctions. On 26 May 2022, he said at the Eurasian Economic Forum: "*Belarus has preserved competencies that matter to us, especially in microelectronics. We agreed with Aliaksandr Lukashenka to earmark special financing for the products of this industry, which will be in demand in Russia*."

The heads of state continued discussion of prospective cooperation during Putin's visit to Minsk on 19 December 2022. The Belarusian premier said that import substitution in microelectronics was one of the main topics addressed during the talks. Relevant agreements were signed paving the way for serious technological modernisation of both *Integral* and *Planar* to enable them to increase output targeting both Russia and Belarus.

> Moscow is additionally interested in many other Belarusian companies (there are dozens of them on Moscow's wish list).

For example, developments in the Ukrainian frontlines suggest that a considerable increase in Russian orders for products of the *Minsk Wheeled Tractor Plant* (MZKT) can be expected in the near future. Special wheeled chassis and tractors manufactured under the MZKT brand are used to carry many weapons and military systems that are currently in use in the Russian Federation. These include the *Iskander* ballistic missile system, the *Bastion* and *Bal* coastal defence missile systems, the S-300 and S-400 SAM

systems, the wheeled versions of the *Buk* and *Tor* air defence missile systems, the *Smerch*, *Tornado* and *Uragan-1M* multiple rocket launchers, as well as the *Topol*, *Topol-M* and *Yars* strategic missile systems. Some products that are manufactured in Belarus can be quite easily replaced by Russian equivalents. However, the products made by the flagships of the Belarusian industry are not so easy to replace because of the lack of relevant competencies, especially against the backdrop of sanctions and ongoing combat activities.

Naturally, military and technical cooperation between Belarus and Russia is not a "one-way street". Russian civilian and defence enterprises also supply a broad range of parts and units to their Belarusian allies. However, these supplies are not a single option for Minsk. The situation is different when it comes to deliveries of finished models of arms and military equipment — given the permanent sanctions imposed by the collective West, Russia appears to be the only possible supplier to Belarus. In recent years, Russia has delivered to Belarus (and has promised to keep on its supplies) dozens of such products. They include the T-72B3 tanks, the BTR-82A armoured personnel carriers, the Mi-8MTV-5 multipurpose transport helicopters, the Mi-35M attack helicopters and the Su-30SM multirole fighters. The delivery of the S-400 SAM systems and the *Iskander* ballistic missile systems to Belarus-based joint training and combat centres was quite sensational. They have already been put on combat duty.

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