



Russia's "Avangard" Hypersonic Glide Vehicle Enters Serial Production

OE Watch Commentary: The Russian Federation has been pursuing the creation of a Hypersonic Glide Vehicle (HGV) to circumvent ballistic missile defense systems for decades. An HGV is a reentry vehicle that separates from an Intercontinental Ballistic Missile (ICBM), delivering a (likely nuclear) warhead. An HGV will be able to travel at a very high speed, possibly over Mach 20, and will be capable of maneuvering. The combination of extreme speed and maneuverability would make targeting an HGV by a ballistic missile defense system incredibly difficult, as mentioned by the accompanying excerpted article from *Zvezda TV*. The accompanying excerpted article from *Rossiyskaya Gazeta* discusses how the "Avangard" HGV is now entering serial production. If this reporting is accurate, Russia has solved the numerous technical problems of delivering a nuclear warhead accurately at extreme speeds (and associated heat), and now has at least a prototype of an operationally capable system. The accompanying excerpted article from *Izvestiya* explains that Russia will start to train specialists to operate this HGV and associated ICBM, the Sarmat. Interestingly, computer programming is a key part of the training, apparently the HGV's flight parameters can be adjusted by military personnel prior to launch. **End OE Watch Commentary (Bartles)**

“Starting this training year, the Defense Ministry has begun training specialists who will engage in servicing Sarmat and Avangard strategic missile complexes.”

Source: Konstantin Sivkov, "Названо главное преимущество комплекса «Авангард» (The Main Advantage of the 'Avangard' System)," *Zvezda TV*, 12 December 2018. <https://tvzvezda.ru/news/opk/content/201812121317-49ln.htm>

Systems such as the Russian Avangard hypersonic missile complex do not exist in any other country in the world. This was stated by Konstantin Sivkov, Deputy President for Information Policy of the Russian Academy of Missile and Artillery Sciences.

“The main advantage is that the missile follows a grazing trajectory and it maneuvers in the process of flight. Because of this ballistic missile defense systems will, in fact, be unable to strike it. At present there are no similar systems in the world. American ballistic missiles follow a conventional ballistic trajectory,” Sivkov explained in the “Special Report” program Zvezda...

Source: Oleg Koryakin, "Россия приступила к серийному производству гиперзвукового «Авангарда» (Russia Begins Series Production of Hypersonic 'Avangard')," *Rossiyskaya Gazeta*, 5 December 2018. <https://rg.ru/2018/12/05/rossiia-pristupila-k-serijnomu-vypusku-giperzvukovogo-avangarda.html>

A domestic hypersonic super weapon that is able to overcome any modern ballistic missile defense system has entered series production. The beginning of series production of the Avangard was reported by Valeriy Gerasimov, Chief of the General Staff of the Armed Forces of the Russian Federation, at a briefing for foreign military attaches.

We recall that it was previously reported in the mass media that missiles equipped with a hypersonic vehicle will assume combat alert in the RVSN [Strategic Missile Troops] in 2019. Initially there will be two complexes as part of a regiment. Later their number will increase to six.

“A domestic hypersonic super weapon [The 'Avangard' Hypersonic Glide Vehicle] that is able to overcome any modern ballistic missile defense system has entered series production.”

Source: Roman Kretsul and Aleksey Ramm, "Ракетный кадр: офицеров обучат работе с гиперзвуковым оружием за 5 лет (The Missile Cadre: Officers Will Be Trained to Work with Hypersonic Weapons over Five Years)," *Izvestiya*, 1 November 2018. <https://iz.ru/788805/roman-kretcul-aleksei-ramm/raketnyi-kadr-ofitcerov-obuchat-rabote-s-giperzvukovym-oruzhiem-za-5-let>

Starting this training year, the Defense Ministry has begun training specialists who will engage in servicing Sarmat and Avangard strategic missile complexes. A corresponding program has been introduced at the Strategic Missile Troops Academy...due to the strategic complexes' special characteristics, it is necessary to train cadres from scratch, not to retrain Strategic Missile Troops officers. The academy will produce specialists in servicing the systems, combat crews, and also groups for controlling missiles in flight.

Due to the systems' complexity, a new training program has had to be created. It includes subjects connected with digital technologies and with servicing complex digital systems and products made from composite materials.

It is necessary for future operators of the Sarmat and Avangard complexes to first master the most up-to-date programming technologies, without which it is impossible to set the flight parameters of such missiles, Colonel General Viktor Yesin, the Strategic Missile Troops Main Staff former chief, noted.

“No such system exists anywhere in the world. This is the first complex where the function, let's say, of a UAV is performed by a product that is capable of active maneuvering in respect of both altitude and direction,” Viktor Yesin explained to Izvestiya. “It was, of course, necessary to develop new programs and to train new specialists. This complex differs so greatly from the present ones that it is easier to train personnel right out of school than to retrain people.”

In recent years, due to IT developments, various design systems have also been undergoing changes. And an engineer who services complex automated systems must already not simply know the “hardware” but, first of all, be able to create the software innards, Andrey Proletarskiy, the dean of the Bauman Moscow State Technical University's Information Processing and Management Systems Faculty, explained to Izvestiya.