



Improvements to the Onyx Coastal Defense Missile

OE Watch Commentary: The Onyx (Yakhont for export variant) supersonic homing anti-ship missiles were first fielded in 2002, after being in development since 1982. They were designed to destroy surface ships of all classes, particularly vessels comprising surface strike groups, carrier battle groups, amphibious assault forces, and convoys. One of the Onyx missile's most interesting characteristics is its guidance system. The guidance system can purportedly work in tandem with other missiles, and can allocate and classify targets based on their importance, and then select an appropriate attack scheme. Following the destruction of the primary target, the remaining missiles attack other ships, so no target is attacked by more than one missile. After an initial target lock is achieved, the Onyx shuts down its radar and descends to a low altitude (5 to 10 meters), below the operational level of most air defense radars. Once the missile emerges from beneath the radio horizon, the radar is reactivated and locks back on to the target. This feature, in conjunction with the Onyx's high rate of speed, greatly complicates adversarial air defense and electronic warfare countermeasures. The Onyx can be ship-launched, and launched from the "Bastion" Coastal Missile Complex (BRK).

The accompanying excerpted article from *TASS* discusses plans to upgrade the Onyx missile that currently has a 600km range to the Onyx-M with an 800km range, among other improvements. The passage from *Izvestiya* discusses Russia's efforts to provide additional targeting data to these Onyx-M missiles, so the missiles' enhanced range may be fully exploited. **End OE Watch Commentary (Bartles)**

“A machine-building science and production association has developed an Onyx-M sea-launched cruise missile with a maximum range of 800 km and enhanced accuracy of delivery to naval surface and ground targets.”



Bastion-P Coastal Defense Missile System.

Source: Russian Ministry of Defense via mil.ru http://eng.mil.ru/images/military/gallery/2018/_NEV1557-550%281%29.jpg, CC BY-NC-ND 4.0



Continued: Improvements to the Onyx Coastal Defense Missile

Source: “Эксперт: бросковые испытания ракеты “Оникс-М” с дальностью 800 км уже проведены (Expert: An ‘Onyx-M’ Cruise Missile with an 800 km Range Has Been Developed in Russia),” *TASS Online*, 25 September 2019. <https://tass.ru/armiya-i-opk/6925991>

Expert: An ‘Onyx-M’ Cruise Missile with an 800 km Range Has Been Developed in Russia

A machine-building science and production association has developed an Onyx-M sea-launched cruise missile with a maximum range of 800 km and enhanced accuracy of delivery to naval surface and ground targets. The missile’s flight tests will begin in the months immediately ahead, two sources in the Russian Federation defense industry complex informed TASS on Wednesday.

“Based on the Onyx cruise missile that exists in the armory, a new version -- the Onyx-M -- has been developed, with a maximum range of 800 km,” one agency informant reported.

The source added that “the missile is equipped with a perfected control system and will be able to destroy both naval surface and ground targets with greater accuracy.” The missile’s protection against effects of electronic warfare equipment has also been increased, the agency’s informant added.

The other defense-sector source informed TASS that the flight design tests of the Onyx’s latest version were due to begin in the first ten days of September, on the Northern Fleet’s naval weapons test range in the Barents Sea water area. To guarantee the safety of shipping and of civil aviation flights, several areas of the sea were being closed off to accommodate these tests; “However, the launches were not executed, because of the need for additional checks on the product’s experimental models.” “It is expected that the flight tests will begin in the next month or two,” the agency’s informant said. According to the source, the upgraded missile, like the Onyx currently in the arsenal, is capable of carrying a conventional and a nuclear warhead. The Onyx-M’s maximum velocity and its weight and size characteristics have remained the same as those of the missile’s original version. The machine-building science and production association that developed the Onyx has not commented on the information provided by the sources.

The machine-building science and production association earlier announced plans for improving the Onyx’s characteristics, without specifying which actual parameters were meant. “Yes, we proposed to improve the Onyx missiles’ flight characteristics in order to boost this antiship system’s effectiveness,”...

Source: Aleksey Ramm, Bogdan Stepovoy, “С корабля на «Бастион»: атака береговых батарей станет внезапной (From the Ship to the ‘Bastion’: An Attack of the Coastal Batteries Will Become a Surprise Attack),” *Izvestiya*, 22 October 2019. <https://iz.ru/930452/aleksei-ramm-bogdan-stepovoi/s-korablia-na-bastion-ataka-beregovykh-batarei-stanet-vnezapnoi>

From the Ship to the ‘Bastion’: An Attack of the Coastal Batteries Will Become a Surprise Attack

State-of-the-art Project 22160 “Vasiliy Bykov” corvettes will be able to guide “Bastion” coastal missile complexes (BRK) to the enemy. The new tactic will permit them to operate from an ambush. The low-observable “Bykov” corvettes, which are manufactured based upon “stealth” technologies, will track the enemy from a safe distance for themselves. But the BRKs, which are now impossible to detect with their radars switched off, having received target designations from the seamen, will immediately conduct a strike against the enemy...

*The coordination system of the “Bastions” and the corvettes was tested this year, when the “Vasiliy Bykov” was following US military ships on the Black Sea. The seamen conducted surveillance of the Americans not only visually but also using radars and reconnaissance – these systems permit them to pinpoint the location of ships based upon the operation of their equipment, sources in the Ministry of Defense told *Izvestiya*.*

*Inter-branch reconnaissance-weapon loops, which seriously increase the effectiveness of the coordination of the Ground Forces, Aerospace Forces (VKS), and the Navy, are being introduced into the Armed Forces right now, Arsenal of the Fatherland” Publication Editor-in-Chief Viktor Murakhovskiy pointed out. “Three components are part of the loop – reconnaissance and target designation systems, the command post, where the decision is made on the strike, and the weapon systems directly”, the expert told *Izvestiya*. “In our case, the ships must find the enemy and transmit the information to the command post, where they will conduct an analysis of the situation and will make a decision on target destruction. Then the order and coordinates of the enemy ships will arrive at the ‘Bastion’ battery, which will open fire”...*

The coastal complexes can destroy both individual ships and also ships in the composition of landing formations, convoys, and carrier strike groups. Their missiles are capable of destroying targets at a distance of approximately 500 kilometers...The “Bastion’s” launchers are installed on a highly-mobile MZKT-7903 chassis, which provides the capability to the batteries to change firing positions. The BRKs that are roving along the coast with their radars switched off will be inconspicuous to the enemy. One will only be able to find them using satellite or aircraft reconnaissance, which will be difficult to do.

Meanwhile, having received a target designation from the escort ship, they will be able to practically immediately conduct a surprise attack against the enemy. New “Onyx” supersonic anti-ship missiles, which any state-of-the-art air defense system is unable to combat, are in the BRK’s ammunition allowance. Military personnel don’t need precise coordinates for a successful attack – it is sufficient to know the quadrant, where the hostile ships are located.

The supersonic “Onyx”, having reached the detection locations, will switch on the seeker head, which will find the target. A warhead weighing 300 kilograms can destroy or disable even the largest surface combatants. After the attack, the complexes will leave the firing positions without turning on the radars...