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Related Categories: Cybersecurity and Cyberwarfare; Intelligence and Counterintelligence; Military Innovation; Missile Defense; Science and Technology; North Korea

U.S. NAVY SWAPS SHELLS FOR HYPERSONICS...
For years, the U.S. Navy has tried to mount railguns aboard ships, without much success. Now, however, the service branch may have quietly developed a game changing innovation - one that does not require retrofitting its large surface vessels. Engineers have developed a hyper velocity projectile (HVP) capable of traveling at speeds of Mach 3 with a range of 40 miles, which can be fired from the standard Mk.45 5-inch gun system found on all missile cruisers and destroyers. Reportedly, the *USS Dewey* successfully conducted the first known HVP sea-based test during the 2018 Rim of the Pacific (RIMPAC) exercises. In addition to traveling three times the distance of conventional shells, HVPs possess a guidance system that allows for significantly increased accuracy. The weapons can be used against aerial targets, including aircraft and missiles – and they are appreciably cheaper than conventional surface-to-air missiles (some 1/20th of the price). (*Popular Mechanics*, January 8, 2019)

...AND SHIFTS STRATEGY TO ADD UNMANNED WARSHIPS
In an effort to improve effectiveness, the Joint Staff has approved a new fleet structure for the U.S. Navy. The revised posture reportedly includes the addition of unmanned surface vessels to the service's overall deployments. Officials are reportedly requesting information from industry on two new types of unmanned warships, including a medium sensor platform along the lines of DARPA's "Sea Hunter," and a large surface combatant able to carry sensors and weapons. These developments are part of a wider strategy to counter maritime advancements made by China and Russia. The Navy has developed concepts such as "distributed maritime operations" and "distributed lethality" with the objective of having several smaller offensive vessels spread across a larger surface area. The presence of a multitude of smaller unmanned weapon-carrying vessels, the strategy contends, will complicate adversary defenses. (*Defense News*, January 15, 2019)

MISSILE DEFENSE REVIEW UNVEILED
The Pentagon's 2019 Missile Defense Review, outlining the U.S. government's long-awaited strategy for defense against enemy missiles, has revealed an interest in laser and space-based missile defense systems, as well as other innovative technologies. The report calls for a robust multi-layered approach to deal with limited missile threats, focusing more on regional responses than on homeland defense (which has served as the centerpiece of missile defense efforts over the past several years). The report advocates for better space-based sensors to alert when adversarial missiles are launched — an initiative that appears to have received a warm response on both sides of the political aisle. Far more controversial, however, are the strategy's reinvigorated efforts to destroy intercontinental ballistic missiles (ICBMs) during their most vulnerable part of flight, boost phase.

Efforts in this domain include the possibility of using F-35s to neutralize nuclear-tipped missiles before they can reach the upper atmosphere. The proposition is highly controversial, because destroying an ICBM during its initial ascent would require the pilot to fly within enemy territory, while arming an F-35 with a projectile capable of neutralizing an ICBM would compromise its stealth functionality. A more practical alternative is the use of unmanned drones equipped with lasers, because such systems would operate at much higher altitudes and away from enemy fire. However, a large-scale laser capable of remaining at high altitudes for a long duration of time is not yet a reality. The Review suggests further study of the feasibility of space-based interceptors, and acknowledged that new investments were needed to counter hypersonic weapons. (*Defense News*, January 16, 2019; *Motherboard*, January 18, 2019)

PENTAGON DEVELOPS HYPERSONIC PROVING GROUND
The U.S. government is ramping up its efforts to respond to China and Russia's rapid development of hypersonic weapons. The Navy is reportedly calling for contractors to submit proposals to reactivate a testing ground in the Mojave Desert, known as Launch Test Complex at China Lake, to begin testing various hypersonic platforms. The contract is specifically requesting bids for "site re-activation, test and evaluation, support to enable fielding or deployment, as well as upgrade, design and fabricate" various systems. The news comes amid ballooning Pentagon investments in hypersonic weapons, with the relevant budget for 2019 now hitting the $278 million mark. (*Breaking Defense*, January 23, 2019)

THE OTHER PARTS OF PYONGYANG'S ARSENAL
Amid the extensive international attention being given to North Korea's nuclear program and the prospects for some sort of diplomatic deal between Washington and Pyongyang, another aspect of the DPRK's strategic arsenal - its bioweapons program - has received considerably less attention. However, the Middlebury Institute of International Studies (MIIS), a U.S. research institution, released a study in December concluding that North Korea is building on foreign research to develop new equipment capable of producing bioweapons. Another report from artificial intelligence company Amplyfi corroborated the findings by scouring the "deep Web" for search terms related to bioweapons emanating from North Korea, among them "gene expression," "nuclear acid sequence," and "antibiotic resistance." This new research focus is a complement to the DPRK's extensive chemical weapons arsenal; the South Korean military estimates that Pyongyang has stockpiled around 5,000 tons of chemical weapons to date, and possesses the technology to produce 2,000 tons of chemical agents every year. (London *Telegraph*, January 18, 2019)
