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Feature Report

“Nonstrategic Nuclear Weapons”. Published by Congressional Research Service; Updated Jan. 17, 2019

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Recent debates about U.S. nuclear weapons have questioned what role weapons with shorter ranges and lower yields can play in addressing emerging threats in Europe and Asia. These weapons, often referred to as nonstrategic nuclear weapons, have not been limited by past U.S.-Russian arms control agreements, although some analysts argue such limits would be of value, particularly in addressing Russia’s greater numbers of these types of weapons. Others have argued that the United States should expand its deployments of these weapons, in both Europe and Asia, to address new risks of war conducted under a nuclear shadow. The Trump Administration addressed these questions in the Nuclear Posture Review released in February 2018, and determined that the United States should acquire two new types of nonstrategic nuclear weapons: a new low-yield warhead for submarine-launched ballistic missiles and a new sea-launched cruise missile.

... Analysts have identified a number of issues with the continued deployment of U.S. and Russian nonstrategic nuclear weapons. These include questions about the safety and security of Russia’s weapons and the possibility that some might be lost, stolen, or sold to another nation or group; questions about the role of these weapons in U.S. and Russian security policy; questions about the role that these weapons play in NATO policy and whether there is a continuing need for the United States to deploy them at bases overseas; questions about the implications of the disparity in numbers between U.S. and Russian nonstrategic nuclear weapons; and questions about the relationship between nonstrategic nuclear weapons and U.S. nonproliferation policy.

Some argue that these weapons do not create any problems and the United States should not alter its policy. Others argue that the United States should expand its deployments of these weapons in response to challenges from Russia, China, and North Korea. Some believe the United States should reduce its reliance on these weapons and encourage Russia to do the same. Many have suggested that the United States and Russia expand efforts to cooperate on ensuring the safe and secure storage and elimination of these weapons; others have suggested that they negotiate an arms control treaty that would limit these weapons and allow for increased transparency in monitoring their deployment and elimination. The 115th Congress may review some of these proposals.

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NUCLEAR WEAPONS

Defense News (Washington, D.C.)

Work Completed on Navy's Upgraded Nuclear Warhead

By Aaron Mehta

Jan. 23, 2019

WASHINGTON — The National Nuclear Security Administration has completed work on an updated nuclear warhead for the Navy, the first in a series of major life-extension programs for America's arsenal.

The NNSA announced today that as of December, all of the Navy's W76-0 warheads, introduced in the late 1970s, have been updated to the W76-1 design. The W76-1 warhead is placed on the re-entry vehicle for the submarine-launched Trident II D5 ballistic missile.

Production on the W76-1 started in Sept. 2008; the modernization effort not only extends the service life of the weapons by about 20 years, but comes with added safety features, requiring what NNSA head Lisa Gordon-Hagerty called "significant modifications" to the design.

"Today is a shining example of the crucial role NNSA plays in enhancing our nation's nuclear security," Gordon-Hagerty said at a ceremony Wednesday in Texas.

Completing the W76-1 program is indeed a major milestone for the agency, not just because of the capability it will provide, but because it is the first of the major life-extension programs NNSA has underway — something of a proof-of-concept for the agency going forward. Gordon-Hagerty acknowledged as much, saying the program's completion is a sign the agency can "develop, execute and complete" future life extensions and modifications.

However, there may still be work to do for the W76 going forward, thanks to the Trump administration's decision to seek a low-yield variant of the weapon, dubbed the W76-2. Production for that design could be done as soon as next year or go through FY24, depending on funding, but its future is unclear; democrats oppose the warhead design, and Rep. Adam Smith of Washington, the new chairman of the House Armed Services Committee, has said he will look to kill the development and use those funds elsewhere.

For now, Gordon-Hagerty said, the NNSA is "track to meet DoD requirements" on the W76-2.

The next nuclear warhead program to hit a major milestone should be the B61-12, a new version of America's nuclear gravity bomb which will replace the B61-3, -4, -7 and -10 variants. That program is slated to deliver its first production unit in FY20 and complete production by FY24. NNSA estimates the program will cost between \$7.3 and \$9.5 billion.

<https://www.defensenews.com/space/2019/01/23/work-completed-on-navys-upgraded-nuclear-warhead/>

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Phys.org (Isle of Man, Europe)

Zirconium Isotope a Master at Neutron Capture

By Anne M. Stark, Lawrence Livermore National Laboratory

Jan. 17, 2019

The probability that a nucleus will absorb a neutron is important to many areas of nuclear science, including the production of elements in the cosmos, reactor performance, nuclear medicine and defense applications.

New research from a team led by Lawrence Livermore National Laboratory (LLNL) scientists reveals that the radioactive isotope zirconium-88 (^{88}Zr) is 100,000 times more likely than expected to absorb any room-temperature ("thermal") neutron it encounters. The research appears in the Jan. 7 edition of the journal *Nature*.

Zirconium-88 is a particular type, or isotope, of zirconium, distinguished by the number of neutrons it contains. Typical zirconium contains about 50 neutrons, but ^{88}Zr , which is radioactive and not found naturally on Earth, has fewer than normal, with 48 neutrons.

While neutron absorption (known as a neutron-capture cross section) has been studied in detail for many stable isotopes, not much is known about this property for radioactive isotopes. The newly discovered ^{88}Zr thermal neutron-capture cross section is larger than that of any stable isotope. This means that when the ^{88}Zr nucleus encounters a thermal neutron, it is very likely to capture it and incorporate it as part of the nucleus. Thermal neutrons are found in nuclear reactors, and any other neutron (from a nuclear reaction or nuclear decay) that starts out at high energy, will bounce around until it reaches room temperature.

"The big surprise here is that ^{88}Zr , a radioactive isotope of zirconium with two neutrons fewer than the lightest stable zirconium isotope, has a thermal neutron capture cross section that is so much larger than expected and is in fact the second largest ever discovered," said LLNL physicist Nicholas Scielzo, principal investigator for the research project. "The last time a cross section of this magnitude was discovered was when nuclear reactors were first turned on in the late 1940s."

The finding is significant because it showcases how little is known about how radioactive isotopes interact with neutrons, as well as implications for ^{88}Zr in national security missions.

"Neutron-capture reactions are important for a variety of applications and for how the heavy elements were built up," Scielzo said. "For example, these reactions impact reactor performance by taking away neutrons that could otherwise cause nuclear fission, and they are responsible for transmutation of some of the diagnostic isotopes used in stockpile stewardship."

The neutron-capture cross sections for most radioactive nuclei are poorly known, despite the importance of this information to a range of topics in both fundamental and applied nuclear science. Understanding the origin of the elements in the cosmos is one of the most important overarching challenges in nuclear science and requires neutron-capture cross sections for the many radioactive nuclei produced along the nucleosynthesis pathways. Essentially all the elements heavier than iron were created via successive neutron-capture in environments such as giant branch stars, core-collapse supernova and neutron-star mergers.

Nuclear reactors and weapons have exploited neutron-induced reactions to harness enormous amounts of energy, relying upon detailed neutron inventory for predictable performance. In a nuclear reactor, nuclides with large neutron-capture cross sections act as a poison in the fuel and diminish performance or can be introduced intentionally to control fuel reactivity.

The science-based stockpile stewardship program, which is used to maintain high confidence in the safety, security, reliability and effectiveness of the nuclear stockpile in the absence of nuclear testing, relies in part on cross sections for radioactive isotopes to interpret archival data from underground tests (UGTs) of nuclear devices. The transmutation of stable yttrium and zirconium detector material loaded in UGTs produced radioactive isotopes, such as ^{88}Zr that served as important diagnostics sensitive to neutron and charged-particle fluences. However, the nuclear-reaction network calculations, which model the production and destruction of these radioactive isotopes, rely on cross sections for which there are limited or no data, making it challenging to interpret the historical data.

"What I find especially intriguing is that the two largest thermal neutron-capture cross sections are both on radioactive isotopes (xenon-135 is the largest, ^{88}Zr is the second largest) and neither were expected, so maybe there are many more surprises to be discovered as we continue to investigate radioactive isotopes," Scielzo said. "Maybe this is a hint that these reactions won't be quite what we expect and this would have a big impact on our understanding of how the elements from iron to uranium were formed in the cosmos."

<https://phys.org/news/2019-01-zirconium-isotope-master-neutron-capture.html>

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US COUNTER-WMD

Defense News (Washington, D.C.)

The Missile Defense Review Is Out. Will Congress Fund It?

By Aaron Mehta, Joe Gould, and Tara Copp

Jan. 18, 2019

WASHINGTON — The Missile Defense Review, formally unveiled Jan. 17 at the Pentagon by President Donald Trump, calls for major investments from both new technologies and existing systems.

"I will accept nothing less for our nation than the most effective, cutting-edge missile defense systems," Trump said. "We have the best anywhere in the world. It's not even close."

But unless Congress approves the major funding increase that will be required to make it all a reality, many of those programs may fall by the wayside — and questions are emerging over whether these systems will be funded by a Democratic House of Representatives that is looking to cut defense spending.

House Armed Services Committee Chairman Adam Smith, D-Wash., signaled at the competing budget pressures in a hallway interview after the rollout, saying: "It's not sustainable to expand everything."

"I mean, you saw the Air Force, they wanted 25 percent more planes than were currently projected." Smith said. "We got the nuclear modernization program that's enormously expensive; we're hellbent to have a 355-ship Navy; they want an end strength — I forget what the hell it was Trump said about that. Missile defense, they want more for that."

"I would like to have a discussion about the choices involved."

Rep. Mike Rogers, the outgoing chairman of the HASC Strategic Forces Subcommittee and incoming ranking member of the House Committee on Homeland Security — and a big enough missile defense advocate to be invited to the review rollout with Trump — acknowledged the budget pressures under a divided government.

"It's going to be a challenge, and the case for more interceptors is so compelling I don't see how we can not go there — but not everybody agrees with me," said Rogers, R-Ala. He added that his successor on the committee, Rep. Jim Cooper, D-Tenn., faces pressure from Smith to trim the nuclear weapons portfolio.

"That may be where we run into a buzzsaw," Rogers said.

Tom Karako, a missile defense expert with the Center for Strategic and International Studies, said if the Department of Defense doesn't get its funding set up in this next budget, it may never get what it wants in terms of nuclear weapons and interceptors.

"If serious funding for these capabilities is not in the 2020 budget submission, then they kind of aren't real," Karako said. "As senior DoD officials have said so frequently, the time for studies is over. Ticktock."

The good news for advocates? John Rood, the undersecretary of defense for policy and one of the lead voices in crafting the review, made it clear the fiscal 2020 budget request will incorporate some of the missile defense spending plans.

"Obviously the budget that will be rolled out is consistent with the Missile Defense Review and will carry it forward," Rood said to one of many questions about funding. "Wait for it when the budget comes out next month."

Rood, along with Pentagon technology chief Michael Griffin and Missile Defense Agency head Lt. Gen. Samuel Greaves, repeatedly declined to go into detail about what will be included in the budget. However, Griffin hinted that funding for a new layer of space-based sensors, something Congress itself has requested, will be notably present.

More broadly, Griffin said he believes the space-based layer is going to be "very affordable."

"It's not some outlandish number. I'm not able, at this point, to give you a specific number, but you're not going to see us working on something that is out of family, if you will," Griffin said.

He also offered a belief that many of the cost assessments for these technologies in the past, which concluded they were too expensive, are no longer applicable.

"I think one of the underlying difficulties with cost assessment for systems which haven't been built yet is that they fairly regularly assume a business-as-usual approach to new developments. We have newer technologies now. We have commercial capabilities coming into being which can help with this," Griffin said. "It has been a very long time since we've deployed any large numbers of any sort of space asset at scale. All of these affect cost estimates, and we have to take that into account in order to produce a reasonable value, and I'm not sure that's always been done."

Just how much money the department will have in its FY20 request, and how much will go toward missile defense, remains unknown.

The Pentagon's budget figure has seesawed dramatically over the last three months. The department had been planning for most of the year according to a \$733 billion defense top-line figure, until the moment at an October Cabinet meeting when Trump announced the figure would be \$700 billion.

That number, delivered close to the planned budget finalization date of Dec. 1, sent planners into a frenzy as they attempted to develop a pair of budget offerings matched to both levels. The situation changed again when, following a meeting with Defense Secretary Jim Mattis and congressional defense leaders, Trump reportedly boosted the budget to \$750 billion.

The department has since received a final figure to work toward, but has not revealed if it is that \$750 billion number or not. The DoD appears headed for a large figure, however, with Trump telling the audience at the Pentagon on Thursday it would top his previous two requests.

<https://www.defensenews.com/pentagon/2019/01/17/the-missile-defense-review-is-out-will-congress-fund-it/>

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The Hill (Washington, D.C.)

Trump's Missile Defense Plan Faces Reality Check

By Ellen Mitchell

Jan. 21, 2019

President Trump's grand plans for the next generation of missile defense don't line up with his administration's new Missile Defense Review, with many of his promised technologies still years away from fruition, missile defense officials and experts say.

Trump, in unveiling the long-overdue document this past week, said he would "accept nothing less" than cutting-edge missile systems likely to require billions of dollars in investments.

"Our goal is simple, to ensure that we can detect and destroy any missile launched against the United States anywhere, anytime, anyplace," Trump told an audience at the Pentagon on Thursday while unveiling the report.

But officials have acknowledge that "some of those experiments" the president touted – including striking enemy missiles shortly after they launch or relying on space-based interceptors - wouldn't be in use for at least a decade.

"There is a bit of a difference between the aspiration expressed by the president and what the missile defense review actually does," said Tom Karako, a missile defense expert with the Center for Strategic and International Studies. "I think it's important to not get taken by the speeches."

One such difference was the highly talked up space-based missile defense layer, or the idea of using earth-orbiting interceptors to track and shoot down missiles. At the Pentagon, Trump and his acting Defense Secretary Patrick Shanahan put an emphasis on the technology, speaking as though it was coming very soon.

"It's ultimately going to be a very, very big part of our defense and obviously of our offense," Trump said. "The system will be monitored and we will terminate any missile launches from hostile powers or even powers that make a mistake. It won't happen, regardless of the missile type or geographic origins of the attack."

Kingston Reif, a missile defense and budget expert with the Arms Control Association, said Trump's goal "is not consistent with the text of the review."

"What Trump described as the goal has never been U.S. policy and for good reason," Reif told The Hill. "Trying to develop such a comprehensive shield, a space wall, you might say, would be unaffordable, unachievable technically and massively destabilizing."

Pentagon officials later that day told reporters that the review does not commit to deploying interceptors in space, instead proposing a six-month study to assess the feasibility of doing so.

Should Pentagon officials decide to move forward with the space layer, such a technology won't be seen in use for another decade, according to John Rood, the undersecretary of defense for policy.

"You'll see experiments in 2021, 2022, on-orbit experiments with, I'll say highly developed metal systems ... and I think you'll see operational systems in the mid and latter part of the 2020s," Rood told reporters Thursday at the Pentagon.

The long-awaited review — initially scheduled for release in late 2017 — will drive the administration's Pentagon funding request for the fiscal 2020 budget. It also provides an outline for how the United States will deter and counter missile threats from Iran, North Korea, Russia and China as well as rogue nations.

"Obviously, the budget that will be rolled out is consistent with the Missile Defense Review," Rood said. "Missile defense has ... occupied a substantial portion of the Defense Department's budget in the past and it will go forward."

But the question remains of whether a Democrat-controlled House will readily fund the advanced technologies Trump seeks as they look to slash defense spending across the board.

Democrats are expected to be especially critical of pursuing the space-based interceptors and "for good reason," Reif said.

Such a missile defense layer "would be extremely expensive," far from technically proven and would also be "destabilizing in so far as Russia and China are likely to react negatively to such a deployment," Reif told The Hill.

The top Democrats from the House and Senate Armed Services committees indicated as such on Thursday.

Rep. Adam Smith (D-Wash.), the chairman of the House panel, said he worried that the review's space interceptor plans could lead to wasted dollars.

"While it is essential that we continue investing in proven missile defense efforts, I am concerned that this missile defense review could lead to greater investment in areas that do not follow these principles, such as a space-based interceptor layer that has been studied repeatedly and found to be technologically challenging and prohibitively expensive," Smith said in a statement.

Senate Armed Services Committee ranking member Jack Reed (D-R.I.), meanwhile, said space-based capabilities "are certainly worth exploring," but without unlimited resources Congress "must weigh investments among competing national security priorities."

Even Rep. Mike Rogers (R-Ala.), a frequent advocate of missile defense, recognized the uphill funding battle the plan is likely to face.

"It's going to be a challenge, and the case for more interceptors is so compelling I don't see how we can not go there - but not everybody agrees with me," Rogers told Defense News.

Pentagon technology chief Michael Griffin argued that the cost of a space-based layer, to be reflected in the Defense Department's fiscal 2020 budget request, is "not some outlandish number."

"The first things that you're going to see, the president specifically alluded to a space sensor layer that will provide, in wartime, the targeting ability we need and, in peacetime, the persistent, timely global awareness that we need," Griffin told reporters alongside Rood.

Reif predicted that several questions would be raised – particularly by Smith – about greater emphasis on boost-phase defense.

The technology is meant to shoot down missiles, in particular those from North Korea, when they're traveling at their slowest rate right after launch. Several reports have raised questions about the practicality and feasibility of the defense.

"Democrats want to ensure that we're not fielding new capabilities and new technologies before they've been tested under realistic conditions. So I think you're likely to see calls for more rigorous testing."

The United States has spent an estimated \$300 billion-plus on countering any potential hostile missiles since the 1980s. The endeavor is an expensive one due to the technological difficulty in shooting an enemy missile out of the air.

The Pentagon currently relies on a missile defense system made up of long-range, ground-based interceptors located at Fort Greeley, Alaska and Vandenberg Air Force Base in California, as part of the ground-based midcourse defense system (GMD). In addition, the U.S. uses interceptor missiles on Navy ships.

The GMD is meant to destroy an approaching warhead by firing interceptors from underground silos. The launched vehicle then releases a projectile meant to hit and destroy the warhead in mid-air.

But the system – in place since 2004 – is far from perfect and expensive to test. The most recent test in May 2017 was successful but cost nearly \$250 million and followed several failed tries.

Missile Defense Agency head Lt. Gen. Samuel Greaves tried to alleviate fears of faulty defense deterrents by insisting that the Pentagon won't try to slap together a new system for the sake of the administration.

"We will take a very disciplined, milestone-driven - those are very key words - data-rich decision-making process to get there," Greaves said alongside Rood and Griffin.

And don't expect unrealistic numbers when it comes to funding the review, Karako said. If the budget reflects the report as delivered instead of the president's Pentagon speech, "I wouldn't expect huge budgetary muscle movements," he said.

Outside of the research and development work for the new technologies, the Trump administration report hews closely to the Obama-era Missile Defense Review, released in 2010, the plans of which Congress largely funded, he added.

"The 2018 report has fewer new programs and finishes much of what was proposed in the Obama era plan," Karako said.

The missile defense dollars have increased under Trump, most notably in late 2017, when the administration proposed an additional \$4 billion for missile defense in the NDAA due to heightened tensions with North Korea. Congress funded the add with very little debate.

With a large Pentagon budget request expected in February - anywhere between \$733 billion and \$750 billion – Trump's new technologies may very well get enough funding to launch.

<https://thehill.com/policy/defense/426170-trumps-missile-defense-plan-faces-reality-check>

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US ARMS CONTROL

Defense News (Washington, D.C.)

With Days to Go before Deadline, Nuclear Treaty Seems Doomed

By Aaron Mehta

Jan. 24, 2019

WASHINGTON — A top American official today indicated it is unlikely that Russia will meet the demands of the Trump administration before a Feb. 2 deadline where America will begin withdrawal from the Intermediate-Range Nuclear Forces treaty.

Asked if she was optimistic Russia would meet the U.S. deadline, Andrea Thompson, undersecretary of state for arms control and international security, was blunt: “I’m not.”

The INF Treaty, signed between the U.S. and Russia in 1987, bans all land-based cruise missiles with a range between 500 and 5,500 kilometers. While the Obama administration had accused Moscow of violating the agreement by deploying such systems, most notably with the Novator 9M729 design, Pentagon officials, including former Secretary of Defense Jim Mattis, have been more vocal under the Trump administration about their concerns.

In December, Secretary of State Mike Pompeo announced the U.S. would set a 60-day timer for Russia to come back under compliance in the eyes of the Trump administration. If Russia does not do that, Pompeo pledged, the U.S. would begin the process of withdrawing fully from the treaty.

Last week, Thompson made a trip to Geneva to meet with Russian negotiators, but left without any change in agreement despite what she said today were “professional” talks between her team and that of Russia’s deputy foreign minister Sergei Ryabkov.

“It wasn’t the normal bluster, propaganda, the kind of dramatics that [often] associate some of these meetings. The deputy foreign minister did have the right people in the room, as did we. But as I said before, we didn’t break any new ground. There was no new information. The Russians acknowledged having the system but continued to say in their talking points it didn’t violate the INF treaty despite showing them, repeated times, the intelligence and information” gathered by the U.S. and its allies, Thompson said at a Defense Writer’s Group breakfast.

On Wednesday, Russia held a media engagement where they showed off the Novator 9M729, making the case that the system is not in violation of the treaty as it can only travel 480 KM, just under the INF limit. Thompson, however, compared that to someone pointing to their car and telling you to figure out how fast it can go without being able to drive it.

“Arms control works when you can fully verify the compliance with it. The transparency measures they brought to the table wouldn’t have done so,” Thompson said.

Jon Wolfsthal, who served as senior director for arms control and nonproliferation at the U.S. National Security Council from 2014 to 2017, points to the public display from Russia as a sign that American pressure is working, saying “Releasing classified information and ensuring NATO allies support US efforts have been effective. Russia has blinked and offered both serious talks and to display the offending 9M729 missile.”

As a result, he urged the administration not to give up on negotiations now by triggering the INF exit.

“Refusing to engage seriously now and pursue this opening would risk all that the Trump team has gained. If the U.S. does not postpone INF Treaty withdrawal and engage with Russia, NATO unity would be shattered and Russia can convincingly claim they went above and beyond to save the Treaty and the U.S. was not interested,” he said.

“There are viable technical ways to address Russia’s INF violation and to give Russia a face-saving way out of this problem by giving them confidence US missile defenses in Europe won’t be equipped with offensive missiles. The solution is there for the taking. It is not clear the Trump admin wants to solve this problem.”

Thompson, for her part, indicated the U.S. has talked with Russia enough on this issue, going back to the Obama administration, and that new steps need to be taken.

“The act of fielding a system that violates the treaty, brought the demise of the treaty or the failure of the treaty,” she said. “To not acknowledge it, and to continue to allow it, I think is an action that undermines arms control. You are now accepting a new norm and setting a precedent for new treaties – ‘I’ll sign a treaty with you but go ahead and violate it, field the system.’”

If nothing dramatic happens, the U.S. will on Feb. 2 officially declare its intention to leave the INF agreement. It will then have a six month period where it ends its obligations. During that period, Thompson said, the U.S. is open to negotiations with Russia continuing and, if the Putin government changes its stance and agrees to destroy the 9M729 system, the U.S. would be willing to keep the INF agreement alive.

But once again, Thompson didn’t sound optimistic.

“We continue to provide them with that information. They continue to deny it,” she said. “Maybe the 50th time will be the charm.”

<https://www.defensenews.com/pentagon/2019/01/24/with-days-to-go-before-deadline-nuclear-treaty-seems-doomed/>

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Homeland Preparedness News (Washington, D.C.)

NNSA Earmarks \$50M to Bolster Nuclear Security

By Douglas Clark

Jan. 23, 2019

The Department of Energy’s National Nuclear Security Administration (DOE/NNSA) has awarded a pair of university consortia grants totaling \$50 million as a means of bolstering nuclear security.

NNSA officials said the Georgia Institute of Technology-led Consortium for Enabling Technologies & Innovation is a collection of 12 universities working to develop and refine technologies supporting the nonproliferation mission to detect and characterize the production of nuclear materials.

The Consortium for Monitoring, Technology & Verification, a partnership of 14 universities led by the University of Michigan, seeks to improve capabilities to monitor the global nuclear fuel cycle. The grants would support each consortium with \$5 million per year for five years.

“These grants will foster development of concepts and technologies that keep the United States at the forefront of nuclear monitoring and verification capabilities and allow us to nurture tomorrow’s nonproliferation experts,” Brent K. Park, NNSA deputy administrator for Defense Nuclear Nonproliferation, said.

The Consortium for Enabling Technologies & Innovation strives to perform basic research in computer and engineering sciences for nonproliferation, advanced manufacturing for nonproliferation, and novel instrumentation for nuclear fuel-cycle monitoring. The Consortium for Monitoring, Technology & Verification focus will be nuclear and particle physics, signals and source terms and the physics of monitoring nuclear materials.

<https://homelandprepnews.com/stories/32199-nnsa-earmarks-50m-to-bolster-nuclear-security/>

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VOA (Washington, D.C.)

North Korean Missiles No Surprise, But May Impact Upcoming Talks

By Steve Miller

Jan. 23, 2019

SEOUL — A report released on Monday by the Center for Strategic and International Studies (CSIS) about a previously undisclosed North Korean missile site may have caught some casual North Korean observers by surprise. But Nam Sung-wook, professor at Korea Unification, Diplomacy and Security at Korea University, said the Sino-ri facility was previously known to both the United States and South Korean intelligence services.

"Last year the U.S. made a report about Sakkanmol and Sino-ri this January. Those are not fresh discoveries," he said.

Archived South Korean news reports dating back to 1998 acknowledge the Sino-ri site as a facility for Nodong missiles.

The CSIS report declared that one of 20 undeclared ballistic missile bases in North Korea serves as a missile headquarters facility and the "Sino-ri missile operating base and the Nodong missiles deployed at this location fit into North Korea's presumed nuclear military strategy by providing an operational-level nuclear or conventional first strike capability."

Kim Dong-yub, the head of the Office of Research at the Institute for Far East Studies (IFES) at Kyungnam University, added, "Although the North has not declared the site officially, it does not mean that it is new. No countries openly announce all the military bases."

Nam notes that the United States focuses on small details regarding denuclearization, like the dismantling of intercontinental ballistic missiles (ICBMs) to reduce the threat to the U.S. "For [President] Trump, he can use this to boast about his achievement during the second summit," Nam said.

Implications for upcoming North Korean Summits

The CSIS report came days after the White House announced that U.S. President Donald Trump would meet North Korean leader Kim Jong Un in late February and that he "looks forward" to the denuclearization talks.

In its report, CSIS said the Sino-ri base was not previously declared by Pyongyang and "does not appear to be the subject of denuclearization negotiations."

Speaking to Reuters news agency, one of the report's authors, Victor Cha, said "The North Koreans are not going to negotiate over things they don't disclose. It looks like they're playing a game."

Nam assesses Trump's focus on the talks with Kim is about eliminating threats, like ICBMs.

“It is hard to achieve complete denuclearization, so including dismantling ready-made weapons from the past, which arouse the strong opposition remains the focus on the present and the future talks. These include ICBMs and missile test sites,” said Nam.

He added that Seoul does not regard the Sino-ri facility as one that imposes a direct threat to South Korea, citing the September 19 Pyongyang Declaration and its efforts to de-escalate tension on the peninsula.

Kim Dong-yub said the CSIS report focuses too much on a connection between the missile facilities and denuclearization.

“The North already announced denuclearization and they took some steps, although some require verification,” said Kim, “So it is not proper to judge their willingness by their possessions of military bases.”

Kim said some groups opposing talks with North Korea and may try to leverage the news to press Pyongyang for more concessions, but he says the upcoming talks between the United States and North Korea should not include these types of missile facilities, for if they do, they could detract from progress on denuclearization.

In an email to VOA, Bruce Klinger, senior research fellow for Northeast Asia at the Heritage Foundation, wrote, “During a second summit, Trump must insist on tangible steps toward North Korean denuclearization, including a data declaration of the regime’s nuclear and missile programs. Trump shouldn’t offer more concessions nor agree to reduce U.N. and U.S. sanctions until Kim moves beyond the symbolic gestures it has taken so far.”

The White House has not commented on the CSIS report and neither Washington nor Pyongyang has yet to officially announce the date or location of the second U.S. - North Korean summit, although some speculate it may take place in Vietnam.

In addition, local media reports in South Korea have indicated the Moon administration may attempt to host Kim in Seoul during the 100th anniversary of the March 1 independence movement.

<https://www.voanews.com/a/north-korea-missile-sino-ri-facility/4755054.html>

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COMMENTARY

The Hill (Washington, D.C.)

‘Fortress America’ Needs Alternatives to Aging Nukes

By Peter Pry

Jan. 24, 2019

U.S. modernization of its nuclear triad of intercontinental ballistic missiles (ICBMs), missile submarines and bombers armed with safe, reliable and effective nuclear weapons, in numbers sufficient to maintain rough parity with at least the Russian nuclear triad, is imperative to the deterrence of world war and survival of the free world.

As proven during the long, dangerous trial of the Cold War:

The triad of land- and sea-based missiles and bombers maximizes survivability, flexibility and credibility of the U.S. nuclear deterrent;

U.S. rough numerical parity with Russian strategic nuclear warheads, deliverable to their homeland, is the absolute minimum necessary to deter the world's most powerful nuclear menace from exploiting Moscow's big advantages in conventional and tactical nuclear forces with aggression against overseas U.S. interests, allies and the United States itself;

Any doubt about the safety, reliability and effectiveness of U.S. nuclear weapons significantly diminishes their deterrence and operational value.

Dr. Keith Payne, president of the National Institute for Public Policy and one of the free world's foremost nuclear strategists, warns that long neglect of the U.S. triad may invite nuclear aggression by Russia.

"Russia appears to have lowered the threshold for making nuclear threats to include preventing Western actions that seem to have little to do with threats to Russia's survival," he says in a Jan. 2 essay. "... Moscow appears to believe that it can employ limited nuclear strikes against U.S. allies, and possibly against the U.S. itself, to prevent a cohesive, powerful Western response to Russia's use of hard power in support of its expansionist goals."

Payne's article notes that, in 2015, NATO's deputy military commander, Lt. Gen. Sir Adrian Bradshaw, cautioned: "Russia might believe the large-scale conventional force it has shown it can generate on very short notice ... could in the future be used not only for intimidation and coercion but potentially to seize NATO territory, after which the threat of escalation might be used to prevent reestablishment of territorial integrity."

Payne calls for resurrection of the bipartisan consensus on U.S. strategic nuclear forces modernization that made victory possible during the Cold War, recognizing the enormity of this political challenge.

Rep. Adam Smith (D-Wash.), the new chairman of the House Armed Services Committee that drafts the defense budget, personifies the broken bipartisan consensus on nuclear deterrence. Smith recently endorsed the agenda of the extremist anti-nuclear Ploughshares Fund. Smith's vision:

Eliminate two of three nuclear triad legs — no ICBMs or nuclear-armed bombers — and retain only missile submarines, halving ballistic missile submarine numbers from 12 to six;

Abandon strategic nuclear parity with Russia for minimum deterrence, reducing U.S. nuclear weapons from 1,500 to 300, with the goal of eventually eliminating them completely;

Adopt a general nuclear "no first use" policy (with exceptions), something the United States rejected throughout the Cold War because it cancels nuclear deterrence of adversary aggression using conventional, chemical and biological weapons; and

Constrain presidential "first use" nuclear launch authority by requiring consent from Congress.

John Hopkins, former chief of the Los Alamos nuclear weapons program, and co-author David Sharp, who was chief scientist of the Science, Technology and Engineering Directorate of Los Alamos, in "The Scientific Foundation for Assessing the Nuclear Performance of Weapons in the Stockpile" (Perspectives, Winter 2019), join many nuclear weapons scientists who doubt that U.S. nuclear weapons, now decades old and untested, are still safe, reliable and effective. They assert it's "not correct" to claim that computer models can verify nuclear weapons will work.

Thus, while modernization of the U.S. nuclear triad is crucial and must be attempted, the United States faces possibly insurmountable problems, unlike Russia, China and North Korea. These include:

Deepening U.S. political and cultural divisions, including over the morality and utility of nuclear weapons, may make resurrection of a bipartisan consensus supporting the nuclear triad impossible;

Absent such a bipartisan consensus, since modernization and sustainment of the nuclear triad requires decades, and because the White House and Congress inevitably change hands, necessary political support for the triad seems improbable; and

Obsolescence of U.S. legacy nuclear weapons, the only ones we have, will inexorably erode the safety, reliability, effectiveness and credibility of the U.S. nuclear deterrent.

Accordingly, if only as an insurance policy against failure to modernize the nuclear triad (at an estimated cost of \$700 billion), the White House should immediately launch programs to deploy space-based missile defenses and harden U.S. critical infrastructures against electromagnetic pulse (EMP) and cyber attacks.

Space-based defenses such as Brilliant Pebbles could render adversary nuclear missiles obsolete, at an estimated cost of \$10 billion to \$20 billion, and could be deployed before the end of President Trump's second term, if he is re-elected. EMP hardening would mitigate worst-case cyber and other threats to the electric grid (at a projected cost of \$2 billion to \$4 billion) and other life-sustaining critical infrastructures (costing \$10 billion to \$20 billion) — using private money, at no cost to government. On a crash basis, much could be accomplished in six months.

Together, these active and passive defenses could be a revolution in military technology, shifting strategic advantage away from nuclear aggressors to the United States. Perhaps a new bipartisan consensus can be built around strategic defenses, with the long-term Reagan-Obama goal of “a world without nuclear weapons.”

At minimum, absent a credible nuclear triad, we will need a “Fortress America.”

Dr. Peter Vincent Pry was chief of staff of the Congressional EMP Commission. He served on the staff of the House Armed Services Committee and at the CIA. He is the author of a new book, “EMP Manhattan Project: Organizing For Survival Against An Electromagnetic Pulse Catastrophe.”

<https://thehill.com/opinion/national-security/426296-fortress-america-needs-alternatives-to-aging-nukes>

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Wilson Center (Washington, D.C.)

We Need a Roadmap: Second Trump-Kim Summit Needs to Be More Than Just Another Photo Op

By Jean H. Lee

Jan. 22, 2019

We have a timeframe: late February. We have rumors of a location: Vietnam. What we don't have yet, as the countdown to President Donald Trump's second date with Kim Jong Un begins, is a roadmap promising that their next summit will be more than just a photo op.

It's been seven months since their first meeting in Singapore last June in a summit that held the tantalizing promise of serving as a historic turning point in North Korean-U.S. relations.

But it has been Kim who largely has benefited from a meeting that gifted him enormous legitimacy internationally and at home. Neither his father nor his grandfather, the late leaders of North Korea,

had ever held a summit with an American president; the images of Kim standing shoulder to shoulder with Trump cemented the impression at home that he is a man respected by the world's most powerful figures and suggested that he was poised to accomplish the main task bequeathed to him by his forebears: resolving the Korean War standoff with the United States.

President Trump, meanwhile, had promised that the threat posed by North Korea's nuclear program was over. Yet in reality, the past seven months have brought us no closer to the denuclearization of North Korea. The diplomacy did yield a reduction in tensions, with none of the nuclear or missile tests that brought the Korean Peninsula to the brink of war in 2017. However, the sparsely worded Singapore Summit declaration has not resulted in any verified dismantling or destruction of nuclear facilities, weapons or fissile material.

At the very least, the meeting did spark an epistolary bromance between the two men, and even cringeworthy exchanges of mutual flattery are preferable to the threats of "fire and fury" and nuclear war that so alarmed the world a year and a half ago.

Both men have unfinished tasks. Kim needs to establish some sort of reconciliation with the United States so that his country can move on from the Korean War and focus on building North Korea's emaciated economy. Trump needs stronger commitments on denuclearization in order to back his claim that North Korea no longer remains a nuclear threat.

There is a risk to rushing headlong into this second summit, as they did the first, without adequate preparation.

But there is a risk to rushing headlong into this second summit, as they did the first, without adequate preparation.

The first time, it may have made sense to get Kim to the negotiating table by according him the respect of a summit. The prideful North Koreans respond to shows of respect; offering a meeting with the U.S. president was an astute gamble.

But failing to convert the summit into a clearly delineated process that will lead us down a path toward North Korea's denuclearization will only benefit the North Koreans — and could end up putting Americans and its allies in Northeast Asia at greater security risk.

The North Koreans likely are pressing for the two leaders to declare an end to the Korean War, a statement that is not a formal peace treaty but could serve as a starting point for multilateral negotiations on a long-term peace mechanism, a goal Kim himself laid out for 2019.

The prospect of declaring an end to the war no doubt appeals to President Trump, who is looking for a quick victory to offset a string of troubles at home and to establish his place in history. The case for a political end-of-war declaration, championed by South Korea's president as well, is compelling. But the consequences to regional security must be carefully considered. Such a declaration would be a massive concession, and must be carefully leveraged in exchange for concrete moves toward denuclearization.

The North Koreans are savvy operators. They'll be looking to gain as many concessions as they can up front, and to hold onto their nuclear weapons and ballistic missiles as long as they can. President Trump may say the threat is over but the U.S. military clearly knows otherwise. North Korea remains an "extraordinary threat," according to the latest Missile Defense Review released last week.

In reality, neither side will get exactly what it wants.

In reality, neither side will get exactly what it wants. But knowing the end goals, the two sides should map out, step by step, what actions and concessions would satisfy both parties to enable the process to keep moving forward.

Kim would prefer to leapfrog over the president's envoys and deal directly with Trump; he's gauging that Trump is easily swayed by emotion and flattery, and disinclined to do his homework. If Trump wants his next summit to be more than just fodder for North Korean propaganda, it is essential that he continue to empower working-level negotiators to nail down the details. Only by letting the officials tasked with the mission to work day in, day out on crafting a viable roadmap to denuclearization can we begin to expect that this second summit will be more than just theater and propaganda.

It's good to see that channels of communication are open again between Washington and Pyongyang after the abrupt postponement of a high-level meeting last November. With just a month before the proposed summit, the challenge is for the Trump administration to use that access to nail the North Koreans down on what each side will offer to get us closer to the goal of disabling the North Korean nuclear threat.

Washington has leverage; they need to be smart in using it.

Follow Jean H. Lee, director of the Hyundai Motor-Korea Foundation Center for Korean History and Public Policy, on Twitter: @newsjean.

<https://www.wilsoncenter.org/blog-post/we-need-roadmap-second-trump-kim-summit-needs-to-be-more-just-another-photo-op>

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The Hill (Washington, D.C.)

Cybersecurity of Our Nuclear Systems Needs to Be a Top Priority

By Morgan Wright

Jan. 17, 2019

Many jokes have been made about who actually invented the internet, most notably after former Vice President Al Gore publicly declared he took the initiative to create it during his time in Congress. But credit — for the impetus, at least — for creation of the internet goes to the former Soviet Union (USSR). On October 4, 1957 the USSR launched Sputnik, the first artificial satellite. Then-Senate Majority Leader Lyndon B. Johnson remarked “Now, somehow, in some way, the sky seemed almost alien.” He remembered “the profound shock of realizing that it might be possible for another nation to achieve technological superiority over this great country of ours.”

In February of 1958, the Advanced Research Projects Agency (ARPA) was born. According to the history of ARPA, the first three primary research priorities focused on space technology (to counter Sputnik), ballistic missile defense (to counter the USSR) and solid propellants (to eventually power the Minuteman ICBM).

As ARPA grew, so did the threats they were being asked to counter. In the 1960s, telephone systems were copper wire and circuit-based. This made our primary means of communication vulnerable to a single missile strike by the USSR. What was needed was a “galactic network” of computers that would continue to function even if the Soviets devastated our telephone system.

Twelve years after the launch of Sputnik, ARPAnet went live. On October 29, 1969 researchers at four universities delivered the first node-to-node communication. UCLA, Stanford, UC Santa

Barbara and the University of Utah became the vanguard for what would become the modern internet. That invention is now coming back to threaten the very thing it was designed to counter; the threat of nuclear weapons.

The Nuclear Posture Review (NPR) is a “legislatively-mandated review that establishes U.S. nuclear policy, strategy, capabilities and force posture for the next five to ten years.” The first NPR took place in 1994. In 2010, the NPR referred to ‘cyber’ once as the report only discussed the need to “protect its assets in cyberspace and outer space and enhanced by U.S. capabilities to deny adversaries’ objectives through resilient infrastructure (including command and control systems), global basing and posture, and ballistic missile defense and counter-WMD capabilities.”

Fast forward to the 2018 Nuclear Posture Review and ‘cyber’ is mentioned sixteen times. This reflects the changing nature of our most critical systems, and the still-lacking protections our aging systems are dealing with. The most critical system is our Nuclear Command, Control and Communications (NC3).

According to the 2018 NPR, “The United States must have an NC3 system that provides control of U.S. nuclear forces at all times, even under the enormous stress of a nuclear attack. NC3 capabilities must assure the integrity of transmitted information and possess the resiliency and survivability necessary to reliably overcome the effects of nuclear attack.”

What is most telling is what the report lists as the first initiative to ensure “our NC3 system remains survivable and effective. That initiative is “strengthening protection against cyber threats.” Since the 2010 NPR, the threats globally have worsened and include “an unprecedented range and mix of threats, including major conventional, chemical, biological, nuclear, space, and cyber threats, and violent non-state actors.”

There is no doubt that Russia and China continue to be our biggest nuclear threats from a state-actor perspective. But it’s two other state-actors, both state sponsors of terrorism, that can and do cause as much concern as China and Russia. Those countries would be Iran and North Korea.

These concerns about our aging NC3 system and inadequate cybersecurity in general threaten to dilute the most effective weapon we have—deterrence. Here’s why. The 2018 NPR addresses the modernization of the NC3 system. Two paragraphs from that report should make us shudder.

“Today’s NC3 system is a legacy of the Cold War, last comprehensively updated almost three decades ago. It includes interconnected elements composed of warning satellites and radars; communications satellites, aircraft, and ground stations; fixed and mobile command posts; and the control centers for nuclear systems.

“While once state-of-the-art, the NC3 system is now subject to challenges from both aging system components and new, growing 21st century threats. Of particular concern are expanding threats in space and cyber space, adversary strategies of limited nuclear escalation, and the broad diffusion within DoD of authority and responsibility for governance of the NC3 system, a function which, by its nature, must be integrated.”

This means North Korea and Iran now have the ability to impact the potent, and usually unspoken, threat of nuclear attack or retaliation. If they can compromise our aging NC3 networks, and plant the seeds of doubt, then they will have successfully turned a credible threat into a bluff.

This also means North Korea and Iran will be able to join Russia and China in a club once limited to nations that were great powers. The 2018 NPR addresses an “evolving and uncertain international security environment.” This environment was eloquently captured by Admiral J.M. Richardson, Chief of Naval Operations, in the report “A Design for Maintaining Maritime Superiority” released in January of 2016.

“For the first time in 25 years, the United States is facing a return to great power competition. Russia and China have both advanced their military capabilities to act as a global power... Others are now pursuing advanced technology, including military technologies that were once the exclusive province of great powers – this trend will only continue.”

A recent report on the Cybersecurity of Nuclear Weapons sums it up succinctly. “A compromised nuclear system that cannot be trusted and lacks credibility will undermine nuclear deterrence and its rationale. Additionally, the assurances that nuclear weapons states make to allies would likely lose their reliability if an adversary could successfully hack into the nuclear weapons systems on which several countries rely.”

With great power comes great responsibility. Our government must modernize our NC3 and ensure no one thinks we’re bluffing.

Morgan Wright is an expert on cybersecurity strategy, cyberterrorism, identity theft and privacy. He previously worked as a senior advisor in the U.S. State Department Antiterrorism Assistance Program and as senior law enforcement advisor for the 2012 Republican National Convention. Follow him on Twitter @morganwright_us.

<https://thehill.com/opinion/cybersecurity/425757-cybersecurity-of-our-nuclear-systems-needs-to-be-a-top-priority>

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ABOUT THE USAF CSDS

The USAF Counterproliferation Center (CPC) was established in 1998 at the direction of the Chief of Staff of the Air Force. Located at Maxwell AFB, this Center capitalizes on the resident expertise of Air University — while extending its reach far beyond — and influences a wide audience of leaders and policy makers. A memorandum of agreement between the Air Staff's Director for Nuclear and Counterproliferation (then AF/XON) and Air War College commandant established the initial personnel and responsibilities of the Center. This included integrating counterproliferation awareness into the curriculum and ongoing research at the Air University; establishing an information repository to promote research on counterproliferation and nonproliferation issues; and directing research on the various topics associated with counterproliferation and nonproliferation.

In 2008, the Secretary of Defense's Task Force on Nuclear Weapons Management recommended "Air Force personnel connected to the nuclear mission be required to take a professional military education (PME) course on national, defense, and Air Force concepts for deterrence and defense." This led to the addition of three teaching positions to the CPC in 2011 to enhance nuclear PME efforts. At the same time, the Air Force Nuclear Weapons Center, in coordination with the AF/A10 and Air Force Global Strike Command, established a series of courses at Kirtland AFB to provide professional continuing education (PCE) through the careers of those Air Force personnel working in or supporting the nuclear enterprise. This mission was transferred to the CPC in 2012, broadening its mandate to providing education and research on not just countering WMD but also nuclear operations issues. In April 2016, the nuclear PCE courses were transferred from the Air War College to the U.S. Air Force Institute for Technology.

In February 2014, the Center's name was changed to the Center for Unconventional Weapons Studies (CUWS) to reflect its broad coverage of unconventional weapons issues, both offensive and defensive, across the six joint operating concepts (deterrence operations, cooperative security, major combat operations, irregular warfare, stability operations, and homeland security). The term "unconventional weapons," currently defined as nuclear, biological, and chemical weapons, also includes the improvised use of chemical, biological, and radiological hazards. In May 2018, the name changed again to the Center for Strategic Deterrence Studies (CSDS) in recognition of senior Air Force interest in focusing on this vital national security topic.

The Center's military insignia displays the symbols of nuclear, biological, and chemical hazards. The arrows above the hazards represent the four aspects of counterproliferation — counterforce, active defense, passive defense, and consequence management. The Latin inscription "Armis Bella Venenis Geri" stands for "weapons of war involving poisons."

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