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Feature Report

“The Air Force of the Future: A Comparison of Alternative Force Structures”. By Todd Harrison.
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<https://www.csis.org/analysis/air-force-future-comparison-alternative-force-structures>

Section 1064 of the fiscal year (FY) 2018 National Defense Authorization Act (NDAA) mandated three separate studies of the Air Force’s current and future force structure. The law specified that the studies consider future threats to air and space forces, traditional and alternative roles and missions for the Air Force, the role of new technology and remotely piloted aircraft (RPAs), and operation and sustainment costs, among other factors. It further mandated that each study include a force-sizing construct for the Air Force and recommended inventories by aircraft type in the 2030 timeframe. The purpose of this report is to compare, contrast, and critique the three studies of the Air Force’s future force structure. While each study had the option of producing a classified annex with additional material, this analysis only considers the unclassified material released from the three studies. *The Air Force of the Future* provides an independent assessment of the current state of the Air Force, areas where the studies agree, areas where they disagree, and areas where additional research and analysis is needed.

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NUCLEAR WEAPONS

Defense One (Washington, D.C.)

The Air Force's 'Doomsday Plane' Is in the Shop

By Marcus Weisgerber

Nov. 6, 2019

Father Time is catching up to the U.S. Air Force's E-4B Nightwatch, the so-called doomsday plane that would direct American forces during a nuclear war and, more prosaically, has been the long-haul ride of choice for several defense secretaries.

That latter mission has been temporarily dropped to reduce wear and tear on the service's quartet of E-4Bs, 1970s aircraft that are slated to fly into the 2020s and that are already in need of extra maintenance and upgrades, according to military officials.

"A number of aircraft are in a maintenance status to ensure they remain flyable for this no-fail mission for the next decade," Lt. Col. David Faggard, a spokesman for Air Force Global Strike Command, said in an email. "Upgrades and maintenance include avionics, wiring, communication equipment, and other components to ensure the platform remains viable in a modern world."

The E-4B — whose nickname alludes to the Cold War-era flick *Dr. Strangelove* — has long been used by defense secretaries for overseas travel. They and their staffs preferred the modified Boeing 747 to the smaller options: military versions of the 757 and 737. The doomsday plane can refuel in the air, allowing a nonstop flight to anywhere in the world.

But with more E-4Bs in the shop for repairs and upgrades, Defense Secretary Mark Esper has had to use other military jets to fly around the world. In September, Esper flew to Europe in a C-17 cargo plane. In October, he flew to the Middle East in a C-32, a military version of the Boeing 757. That's meant a smaller staff and press contingent on the flights.

But it has allowed the Air Force to continue to keep one of the four Nightwatch aircraft either flying or on alert every minute of every day, ready to take off at a moment's notice.

"Our command is committed to maintaining the fleet we have in order to ensure we retain a viable weapon system for the future of our national no-fail mission," Faggard wrote. "Modifications, modernization, and sustainment require disciplined maintenance actions to ensure the long term health of the E-4B fleet. Renewed discipline is the main driver to our change in E-4B operations and subsequent availability."

The Air Force declined to say how many E-4Bs were currently in the shop, citing the sensitive nuclear-command mission.

Using special electronics and transmitters, the E-4B — along with the Navy's E-6B Mercury — can pass launch orders from the president to ICBM silos, nuclear submarines, and flying bombers.

The doomsday plane is often mistaken for Air Force One, but there are noticeable differences. There's the giant hump on its roof that hides satellite antennas. The plane has no windows aft of the cockpit, just a blue stripe running its length.

Embossed with the words "United States of America," the plane stands out, particularly overseas. "It has ramp cred," said a former aide to a recent U.S. defense secretary.

“A high point for me came in Munich when we spotted President Putin’s pilots in the cockpit of his plane taking pictures of ours,” former Defense Secretary Robert Gates wrote of the E-4B in his memoir “Duty.”

The connectivity and special computer networks on the E-4B allows the defense secretary to go about his business as if he’s sitting in the Pentagon. Inside, the plane has conference rooms, a briefing room (which doubles as a press cabin) and a private office and sleeping quarters.

Due to their age and importance of its mission, the E-4Bs get complete overhauls from time to time, outfitting them with new electronics and communications gear. Boeing removes the engines for inspection and dismantles each aircraft, in many cases down to its frame, looking for structural problems.

Yet despite the updates to the communications and electronics, the plane itself is so old that it’s sometimes difficult to find replacement parts. The E-4B and the two planes used as Air Force One are among the oldest 747-200s still flying. Boeing has developed and sold two newer models of the 747 since the E-4B. No American passenger airlines still fly the four-engine 747, opting instead for more fuel-efficient twin-engine aircraft that can carry a similar load of people.

Despite a regimented maintenance regime, the planes still break down, like the time an E-4B flying Gates broke down in Brussels. Two E-4Bs were damaged in 2017 when a tornado ripped through Offutt Air Force Base in Nebraska where they are based.

The Air Force is in the early stages of replacing the 1970s-era plane with a newer model. There is no formal timeline for when a new E-4B will fly.

Marcus Weisgerber is the global business editor for Defense One, where he writes about the intersection of business and national security. He has been covering defense and national security issues for more than a decade, previously as Pentagon correspondent for Defense News and chief editor of ...

<https://www.defenseone.com/technology/2019/11/air-forces-doomsday-plane-shop/161131/>

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Aiken Standard (Aiken, S.C.)

Extra Furnace Bolsters Weapons-Related Mission at Savannah River Site

By Colin Demarest

Nov. 6, 2019

A previously unused industrial furnace at the Savannah River Site has been fired up, buttressing tritium operations there at a time when the related defense mission is expected to significantly expand.

The site, about 30 minutes south of Aiken, now has two furnaces to use in the tritium extraction process. This latest furnace was put into service sometime this year, Savannah River Nuclear Solutions, the lead contractor at the site, and the National Nuclear Security Administration, a semiautonomous U.S. Department of Energy agency, announced Tuesday.

Tritium is a key part of modern nuclear weapons. The rare radioactive hydrogen isotope increases efficiency and yield – the boom, basically.

The Savannah River Site for decades has been the nation's only supplier of tritium for U.S. nuclear weapons. The gas is harvested from rods that were irradiated in a nuclear reactor. It can also be recycled.

From 2007 to 2017, only a single tritium extraction per year was done. But in 2017, three extractions were done. That was a first.

SRNS and the NNSA, the latter dedicated to weapons and related nonproliferation, in a joint statement described the extra furnace as "a stepping stone to readiness for the coming workload."

Savannah River Nuclear Solutions President and CEO Stuart MacVean last month told the S.C. Governor's Nuclear Advisory Council the tritium work at the site was a growing business. The intent, officials have said, is to reach eight tritium extractions per year around 2025.

The second furnace will help match the increasing demand, according to Wallis Spangler, the Savannah River Nuclear Solutions senior vice president for NNSA operations and programs.

In August, the Nuclear Weapons Council visited the Savannah River Site. The council – meant to interface related defense and energy projects – was briefed on plutonium pit production, another weapons mission, and tritium production.

Gen. John Hyten, then the commander of U.S. Strategic Command, applauded what was being done locally.

The NNSA manager at the Savannah River Site, Nicole Nelson-Jean, has said the Nuclear Weapons Council spent "an extensive amount of time" at the tritium facilities.

"So it was an extremely productive trip, and very positive overall," Nelson-Jean said, speaking at the same advisory meeting as MacVean.

Colin Demarest covers the Savannah River Site, the U.S. Department of Energy, the National Nuclear Security Administration and government in general. Follow him on Twitter: @demarest_colin

https://www.aikenstandard.com/news/extra-furnace-bolsters-weapons-related-mission-at-savannah-river-site/article_32cb9982-00a9-11ea-93aa-2366babf462b.html

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National Defense (Arlington, Va.)

Options abound for New Intermediate-Range Missiles

By Jon Harper

Oct. 31, 2019

The Pentagon's plan to develop a new class of missiles could provide important capabilities, but they will come with a hefty price tag, analysts say.

In August, the United States withdrew from the Intermediate-Range Nuclear Forces Treaty, which had prohibited the United States and Russia from deploying land-based nuclear or conventional missiles with ranges of 500 to 5,500 kilometers, after Washington accused Moscow of cheating.

The Pentagon had already commenced treaty-compliant research-and-development activities that focused on mobile, conventional, ground-launched cruise and ballistic missile systems, Secretary of Defense Mark Esper said in a statement.

“These programs are in the early stages,” he said. “Now that we have withdrawn [from the INF Treaty], the Department of Defense will fully pursue the development of these ground-launched conventional missiles.”

Just weeks later, the Pentagon announced that it had conducted a flight test of a conventionally configured ground-launched cruise missile at San Nicolas Island, California.

“The test missile exited its ground mobile launcher and accurately impacted its target after more than 500 kilometers of flight,” the statement said. “Data collected and lessons learned from this test will inform the Department of Defense’s development of future intermediate-range capabilities.”

A Center for Strategic and Budgetary Assessments report titled, “Leveling the Playing Field: Reintroducing U.S. Theater-Range Missiles in a Post-INF World,” estimated costs for a variety of options.

Ballistic land-attack missiles could include: a precision strike missile with an estimated development cost of \$780 million and procurement cost of \$500,000 to \$800,000 per unit; a Pershing III with an estimated development cost of \$820 million and procurement cost of \$16 million per unit; or a longer-range system with a development cost of \$1.1 billion and a procurement cost of \$21 million per unit, the study said.

Cruise land-attack missiles could include: a ground-launched variant of the Joint Air-to-Surface Standoff Missile-Extended Range with an estimated development cost of \$250 million to \$500 million and a procurement cost of \$1.1 million per unit; a ground-launched Tomahawk with an estimated development cost of less than \$100 million and a procurement cost of \$1.4 million per unit; or a ground-launched Tomahawk-Extended Range with an estimated development cost of \$600 million and procurement cost of \$3 million to \$4 million per missile.

A boost-glide hypersonic land-attack weapon has an estimated price tag of \$1.1 billion for development and \$21 million each for procurement.

Ground-launched, anti-ship variants of these missiles would be more expensive than land-attack variants, according to the study.

“Each one of these systems [examined in the report] takes considerable funding in terms of research, development, testing and evaluation to be able to develop and field, so there’s a major opportunity cost” in pursuing them, said Tim Walton, a co-author of the report.

Nevertheless, the weapons would offer a number of operational benefits for the U.S. military, he noted during a recent conference. That includes providing a responsive strike capability to quickly engage time-critical targets; a survivable, difficult to detect force that could be forward deployed; and the ability to strike key nodes in an enemy’s defenses to create operational access for other units.

However, adversaries such as Russia and China have fielded sophisticated integrated air-defense systems, Walton noted.

“We need to either have large numbers of missiles to overwhelm them or have sophisticated missiles that use low signatures, high speeds, a great deal of maneuverability or advanced electronic warfare ... to be able to tunnel through and penetrate their defenses,” he said.

More analysis will be required to determine the right type and mix of intermediate-range systems that the United States should pursue, Walton said. “But the good news is that now that the U.S. has left the INF Treaty, we can have that conversation.”

The Army already has projects in the works. New precision strike missiles and hypersonic boost-glide weapons that exceed the old treaty limitations could potentially be fielded in the early 2020s, Acting Secretary of the Army Ryan McCarthy told reporters.

"These are all achievable in the very near future," he said. "Those are in the process of development. ... A lot of that will be dependent upon a lot of these developmental shots that are going to be taken over the next year to 18 months."

<https://www.nationaldefensemagazine.org/articles/2019/10/31/options-abound-for-new-intermediate-range-missiles>

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Harvard Law Today (Cambridge, Mass.)

Being in Control of U.S. Nuclear Weapons Taught Riley Vann How to Cope – and Maintain Leadership – under Pressure

By Elaine McArdle

Nov. 5, 2019

Seventy to 80 feet underground for 24 hours at a time in a room less than 200 feet square, for more than two years Lt. Riley Vann '22 kept careful watch over 50 Intercontinental Ballistic Missiles (ICBMs) with nuclear capabilities that are part of the United States' nuclear weapon defense force.

As a U.S. Air Force Nuclear and Missile Operations officer, or missileer, Vann, who matriculated at Harvard Law School this year, was one of 90 missileers on duty at any given time in 45 command sites in North Dakota, Montana, and Wyoming. Working in two-person teams, missileers are charged with guarding and maintaining the country's 450 ICBMs. And, should the order come from the president, they are tasked with helping launch them.

"People will ask me what I did [in the Air Force], and when I say I tell them, the reaction is, 'Holy cow, I didn't know we have people who do that!'" says Vann, who remains active duty for the next three years while at HLS. Almost inevitably, their next question is whether Vann could have gone rogue and launched nuclear weapons by herself.

"It's very puzzling that people always ask me, 'Were you tempted to push the red button and launch?' You would be amazed at how many people think that's the way it works," says Vann. "There's one very important point I want to make, which is that there is no big red button!"

In fact, a launch requires a multi-step process with numerous safeguards, known as copy, decode, validate, authenticate. At the beginning of each shift, each member of the two-person team fastens a padlock onto a safe that contains the launch codes. If an apparent launch order comes in, each of them must agree to open her padlock with a combination only she knows. Inside the safe is a code that must match the code of the incoming launch order, but the code has two parts, and neither missileer knows both of them. The safe can't be opened, and the incoming code cannot be verified, unless both team members work together. In that case, they must simultaneously enter an "enable" code. Then each must turn a launch key—both keys are stored in the safe—at the same time. Still, the missiles won't launch unless at least one other capsule in the five-capsule squadron also agrees to launch, at which point 50 or more ICBMs would blast off toward their target. "There are so many fail safes," says Vann.

While on an underground "alert," Vann worked in a two-person team to coordinate maintenance and security of \$210 million in nuclear weapons and technology, and tracked the readiness of the

equipment—and 89 military personnel. It was an enormous responsibility for a 22-year-old, which is precisely why Vann, a graduate of the U.S. Air Force Academy, grew to love the work.

“Definitely at times it was very stressful, and there were times that were boring, I suppose,” she says. “But it really taught you how to cope under pressure and how to maintain leadership while under pressure.”

During her two-year tenure at Minot Air Force Base in North Dakota, Vann pulled 171 alerts, the most memorable a 72-hour alert when it snowed so much there was no way for the relief crew to get to her capsule. “We were underground for three days,” says Vann.

Vann’s military service came as a surprise to herself and her family, which included no military veterans. From the Chicago suburbs, Vann, a superb pole vaulter, was recruited for the track team by the U.S. Air Force Academy. “I took the official visit and when I got to the Academy, I was surprised at how normal everyone was,” says Vann, with a laugh. “I didn’t want to regret not doing it, and I knew if it was not the correct fit I could leave. I ended up loving it. I liked the structure and the idea that everyone was there for a similar purpose: to serve.”

After graduating in 2016, Vann—who figured she was a natural for an intelligence assignment, since she’s fluent in Russian—learned she was to become a missileer, for which the Air Force was selecting candidates from the top of the class (Vann was in the top 10 percent of her class), especially women. “I was surprised and not very happy,” she recalls. “Of course, now in retrospect, I’m so grateful because of the experience. It’s such an important field, and the level of leadership and responsibility you’re given at such a young age, I had no idea that would mean so much to me.”

Following nine months of training at Vandenberg Air Force Base in California, Vann headed to Minot, where she developed an interest in the policy side of the nuclear program and decided to go to law school. The long hours underground provided plenty of time to study for the LSAT, and Vann also started a blog—www.rileyv.com—about her military work, her goal of joining the Judge Advocate General’s Corps, and, now, her time at HLS.

Vann’s HLS education is paid for by the Air Force and the Black Family Fellowship at the Center for Public Leadership at the Harvard Kennedy School, a leadership program for military veterans. At HLS, she says she is particularly inspired by Professor Gabriella Blum LL.M. ’01 S.J.D. ’03, an expert in international law and counterterrorism who served in the Israeli military before becoming a policy adviser to the Israel Defense Forces. After she graduates HLS, Vann—who met her husband, Capt. Benjamin Persian, at the Air Force Academy—will return to the Air Force full-time as a JAG officer.

Vann, who volunteers advising high school students and airmen to apply to the Air Force Academy, was a four-time winner of an Academy award for those in the top 5 percent in fitness. She has taken up hot yoga and is training for a marathon this year.

“If I could tell people one thing, it would be that I’m a person just like you who has interests and is super passionate about my chosen career path,” says Vann, whose husband will be assigned to Hanscom Air Force Base in December, so they can be together. If members of the HLS community have questions about her service, she says, “please come ask me because we love to answer you!”

<https://today.law.harvard.edu/being-in-control-of-u-s-nuclear-weapons-taught-riley-vann-how-to-cope-and-maintain-leadership-under-pressure/>

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Air Force Magazine (Arlington, Va.)

How Boeing Could Repurpose Years of Work on GBSD

By Rachel S. Cohen

Nov. 6, 2019

Boeing may be bowing out of the competition to build the next intercontinental ballistic missile, but the work it has accomplished so far could get new life under other programs.

The defense giant revealed its concerns with the Air Force's Ground-Based Strategic Deterrent program over the summer and indicated it would not continue its bid against Northrop Grumman unless the service agreed to certain changes. But significant design work was already underway, and as the team disbands, the parts they've prototyped and processes they've refined for one of the Air Force's most complex systems can now help others.

"Several technologies were developed that will be applied to other government and commercial products," Boeing spokeswoman Queena Jones said in an email. "Leveraging the technical maturity of other products is a common approach that significantly reduces cost, schedule, and technical risk of development programs."

Jones declined to provide examples of specific programs, like other missiles, nuclear systems, or aircraft, that the technology could bolster.

"Technologies matured for GBSD have broad applications in cyber security, systems engineering integration and tests, modeling and simulation, specialty engineering (reliability, human factors, system safety and maintainability), ground and launch systems, training systems, nuclear hardness and nuclear surety, and command and control," she said.

She noted that model-based systems engineering (MBSE), an approach the Air Force touts as one of the best in acquisition, will spread to other efforts. That uses modeling and simulation to explore various possible designs for less money, and is particularly helpful for projects where the nature and scale prevents a contractor from testing multiple options in real life.

"Boeing also will continue to benefit from these investments as the use of MBSE further matures to improve total life cycle management of complex systems developed for other commercial and government purposes," Jones said. "Boeing's implementation of MBSE has contributed to improved first-time quality and early safety design implementation."

Those who worked on Boeing's GBSD team can apply their engineering and weapon systems expertise across space, defense, and aerospace programs. Jones said that while GBSD teammates were reassigned to other programs within 72 hours of receiving notice that the Air Force would stop funding the company's technology-maturation and risk-reduction work, no one lost their job and no facilities closed as a result.

"Boeing would have brought 4,500 direct and indirect jobs to Alabama as the prime contractor on GBSD," she added.

Leaving the competition does not affect the company's ability to support its Minuteman III, the Air Force's current ICBM, Jones said.

Boeing does not expect that losing funding for GBSD will spur ripple effects across other programs, or deter it from bidding on other aspects of the nuclear triad, like the upcoming overhaul of nuclear command, control, and communications assets.

"We will continue to advance technologies critical to GBSD, realizing these technological advancements and innovations benefit not only GBSD, but many other programs and customers

served by Boeing,” Jones said. “We have invested hundreds of millions in GBSD to date, and we will continue to invest in technologies that have application for and beyond GBSD.”

<http://www.airforcemag.com/Features/Pages/2019/November%202019/How-Boeing-Could-Repurpose-Years-of-Work-on-GBSD.aspx>

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US ARMS CONTROL

The Hill (Washington, D.C.)

Senate Confirms Nuclear Commander

By Rebecca Kheel

Nov. 1, 2019

The Senate has confirmed President Trump’s nominee to lead the U.S. military command in charge of nuclear weapons.

The Senate confirmed Vice Adm. Charles Richard to be commander of U.S. Strategic Command by unanimous consent Thursday night as part of a batch of military nominees. Richard will also be promoted to a four-star admiral as part of the confirmation.

Richard will replace Gen. John Hyten, who was confirmed as vice chairman of the Joint Chiefs of Staff after an extended confirmation process that included an investigation into allegations of sexual assault. Hyten has denied the allegations, and an Air Force investigation did not find corroborating evidence to charge him.

Richard has served as commander of Submarine Forces, Submarine Force Atlantic and Allied Submarine Command since August 2018. He previously served as deputy commander of Strategic Command.

His confirmation comes just a week after his hearing before the Senate Armed Services Committee.

At the hearing, Richard was pressed on two treaties that are said to be on Trump’s chopping block.

Richard would not say whether he thinks the United States should leave the New Strategic Arms Reduction Treaty (New START) or Open Skies Treaty. He pledged to give the president his “best military advice” and listed several pros and cons with each agreement.

“I will support any arms control or other treaty that enhances the security of this nation,” Richard said generally when asked about both treaties.

New START, negotiated by the Obama administration, caps the number of deployed nuclear warheads the United States and Russia can have at 1,550 each.

New START is up for renewal in 2021. The Trump administration has indicated it wants to expand the scope of the treaty as a condition of extension, by taking steps such as folding in China and other weapons not currently covered by the agreement.

Supporters of New START say the Trump administration’s conditions are poison pills meant to kill the treaty.

The Open Skies Treaty, meanwhile, allows the pact’s 34 signatories to fly unarmed observation flights over the entire territory of other signatories. The intention is to increase transparency and

reduce the risk of military miscalculation. Republicans have accused Russia of violating the treaty by blocking flights over some of its territory.

Trump reportedly signed a document signaling his intent to withdraw from Open Skies at the urging of former national security adviser John Bolton just before he left the administration.

<https://thehill.com/policy/defense/468495-senate-confirms-nuclear-commander>

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Stars and Stripes (Washington, D.C.)

North Korea, Angry about Air Drills, Warns Dialogue with US Is 'on the Verge of Extinction'

By Kim Gamel

Nov. 7, 2019

SEOUL, South Korea — North Korea criticized U.S.-South Korean plans to hold joint air exercises next month, warning that hopes for dialogue are “on the verge of extinction.”

The Pentagon confirmed this week that the allies will hold a combined air exercise but would not call it Vigilant Ace, which was canceled last year to facilitate nuclear talks with the North.

The communist state hates all joint military exercises conducted by Seoul and Washington on the peninsula because it considers them rehearsals for an invasion.

Kwon Jong Gun, described as a roving ambassador, pointed out that President Donald Trump had promised to end the drills following his first summit with North Korean leader Kim Jong Un last year.

“The U.S. reckless military frenzy is an extremely provocative and dangerous act of throwing a wet blanket over the spark of the [North Korean]-U.S. dialogue on the verge of extinction,” the diplomat was quoted as saying by the state-run Korean Central News Agency.

He also dismissed the name change and plans to scale back the scope of the exercise.

“No one will believe that the changed war exercises will change their aggression nature,” Kwon said in the statement posted Wednesday.

Seoul and Washington canceled Vigilant Ace and several other joint drills last year but have continued to conduct joint tactical training while keeping it low profile.

“There are no plans to skip upcoming combined exercises,” Army Lt. Col. Dave Eastburn, a Pentagon spokesman, said Tuesday in Washington, giving it a generic name. “We are proceeding with the Combined Flying Training Event as planned.”

He didn’t give more details. South Korean officials told the Yonhap News Agency the drills will be conducted at a smaller scale compared with previous years.

In 2017, as tensions with North Korea were high, the allies mobilized about 230 aircraft, including F-22 Raptors, F-35 Lightning IIs, F-16 Fighting Falcons, F-15 Eagles and F/A-18 Hornet fighter jets for the Americans and F-15K Slam Eagles and F-4 Phantom IIs for the South Koreans.

Seoul and Washington insist the exercises are aimed at ensuring they can operate together in joint missions, but they always infuriate the North, which has frequently responded with missile tests or fiery propaganda.

Diplomatic efforts to persuade the North to give up its nuclear weapons have stalled as subsequent summits and working-level talks have failed to bridge the gap between Pyongyang's demands for sanctions relief and other rewards for steps already taken and Washington's insistence on more extensive disarmament measures.

Most recently, diplomats failed to make progress in talks in Stockholm, Sweden.

Kim Jong Gun said the plan to conduct the air drills "amounts to a declaration of confrontation" and suggested that the North may consider resuming long-range missile and nuclear tests.

"Our patience is nearing the limitations and we will never remain an onlooker to the reckless military moves of the U.S.," he said.

North Korea had largely stopped its saber rattling last year amid a flurry of diplomatic efforts with the United States, but the warnings have resumed as it grows increasingly frustrated over the stalemate.

The North, which has given the U.S. an end-of-year deadline to come up with a more flexible approach, also has conducted several short-range weapons tests this year.

Trump has largely dismissed those as insignificant despite experts warning they demonstrate advances in capabilities.

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<https://www.stripes.com/news/pacific/north-korea-angry-about-air-drills-warns-dialogue-with-us-is-on-the-verge-of-extinction-1.606340>

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VOA (Washington, D.C.)

Iran Stepping back from Nuclear Deal with Increased Fordow Activity

By VOA News

Nov. 6, 2019

Iranian media reported Wednesday that Iran has put a container containing 2,000 kilograms of uranium hexafluoride in its Fordow nuclear facility in order to begin injecting uranium gas into centrifuges.

The move is Iran's latest step away from the agreement it signed in 2015 with a group of world powers to limit its nuclear activity in exchange for sanctions relief.

Under the Joint Comprehensive Plan of Action, Iran was allowed to keep 1,044 centrifuges at Fordow in six cascades, four of which were to remain idle while the other two were allowed to spin without uranium.

"Iran's 4th step in reducing its commitments under the JCPOA by injecting gas to 1044 centrifuges begins today," Iranian President Hassan Rouhani wrote on Twitter. "Thanks to U.S. policy and its allies, Fordow will soon be back to full operation."

Reuters quoted a spokesman from the U.N.'s nuclear watchdog agency saying its inspectors were on the ground in Iran and would report "any relevant activities" to its headquarters in Vienna.

The United States has criticized Iran's increased nuclear activity, which followed last year's U.S. withdrawal from the nuclear deal and a subsequent push by Iran for the remaining signatories to help Iran deal with U.S. sanctions.

U.S. State Department spokesperson Morgan Ortagus said Tuesday that Iran's actions are a "transparent attempt at nuclear extortion."

"We have made clear that Iran's expansion of uranium enrichment activities in defiance of key nuclear commitments is a big step in the wrong direction, and underscores the continuing challenge Iran poses to international peace and security," Ortagus said in a statement. "The JCPOA was a flawed deal because it did not permanently address our concerns with respect to Iran's nuclear program and destabilizing conduct."

Iran previously went past limits on the amount of enriched material it is allowed to stockpile and the level to which it is allowed to enrich uranium.

Rouhani said in a televised address Tuesday that all the steps Iran has taken so far are reversible if the other parties to the nuclear deal uphold their commitments to provide Iran with relief from economic sanctions.

<https://www.voanews.com/middle-east/iran-stepping-back-nuclear-deal-increased-fordow-activity>

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COMMENTARY

Breaking Defense (Washington, D.C.)

Boeing Revives Push for GBSD Team with Northrop

By Robin Rand and Michael Fortney

Nov. 1, 2019

One of the stranger fallouts from Northrop Grumman's acquisition of Orbital-ATK was Boeing's decision to drop out of the program to replace the Minuteman III ICBM fleet. After Boeing dropped out they floated the idea of a "national team" with Northrop and Boeing to build the Ground Based Strategic Deterrent (GBSD). Northrop said, well, no. Then Northrop disclosed it faces an FTC investigation that appears to be about how it's handling the sale of solid rocket motors for GBSD. And now we have this op-ed by two Boeing consultants — one the former commander of Air Force Global Strike Command, the other was deputy commander. They propose some wrinkles to the teaming idea. Read on! The Editor.

When it comes to replacing our ground-based intercontinental ballistic missile (ICBM), we have no time and are, in fact, "late to need." Our current Minuteman force will become operationally unsustainable and unable to meet warfighter needs in less than a decade. On the current path, the Ground-Based Strategic Seterrent (GBSD) is at great risk of becoming yet another mega-program that fails to deliver on time. A slip of that program does not just translate to cost and schedule hits. A late ICBM replacement weakens our strategic deterrent . So, we must act – now.

Gen. Robin Rand, AFGSC commander, speaks at an all call during his visit to Ellsworth Air Force Base, S.D., April 27, 2016. Rand touched on how important family and resiliency is to him, as well as the purpose of modernizing the Air Force's aircraft fleet, including the upgrade of the B-1 bomber cockpit and weapons system officer stations. (Air Force photo by Senior Airman Hailey R. Staker)

Those following recent events in the ICBM replacement story are aware that one of the two contractors vying for the GBSD contract announced it will not compete for the contract. Recent reiterations of this position suggest this is not a bluff.

Some say this is not a problem, citing other single-source programs that delivered satisfactorily. Some also assert any change in the GBSD acquisition strategy at this point will jeopardize schedule. We believe this “steady as she goes” approach is fraught with risk.

The first risk is to schedule. Given the complexity of this weapon system (of systems) and the limited pool of cleared experts in the workforce, we are skeptical a single large contractor can muster the resources to deliver on-time. This mission demands the best our industry has to offer – a cleared, competent team who can build upon the lessons learned from our current ICBM program and be ready on day one.

Also, while Congress seems to have been silent thus far on the likelihood of an \$85 billion sole source solution, they may not stay silent. We can only imagine the schedule perturbations an energized Congress might induce. Finally, the current course of action does nothing to insulate the program from a potentially time-consuming protest. While that may not occur in this case, recent history shows us the schedule-crushing impact large program protests can generate.

The second risk is to the quality of the weapon system. While both contractors vying for the new ICBM are extremely capable, each would privately admit that their competitors would be better suited to handle certain aspects of this complex system of systems. Proof of this is written in the last 50 years of ICBM history, as different industry partners have emerged as the go-to teams for various sub-systems and capabilities of the Minuteman and Peacekeeper systems. Asking one to duplicate what another already does extremely well is costly and time consuming. Why wouldn't we want a solution that puts the best US industry has in the hands of our airmen?

But here we are: the nation is late to need on replacing its aging ICBM and the business as usual acquisition strategy (framed when the competitive landscape was dramatically different) is poised to deliver a potentially less-capable system, later, than operationally needed. We're watching a car on cruise control heading for a wall.

The good news is we don't have to drive into that wall. We can lead our way out of this and, contrary to what some suggest, we believe there is time to do so. We must use the next few months, prior to the late 2020 contract award, to implement a strategy that allows “best of breed” capabilities to be identified and pursued. We must create a framework where both of these industry leaders bring their best to the nation.

Some have called this approach a national or federated team. A federated approach could take various forms, to include a prime-principal subcontractor relationship to a government overseen relationship between two principal contractors (certainly there are other options).

Again, some suggest redirecting the GBSD strategy at this point introduces too much risk to schedule. For the reasons cited above, we believe the greater risk lies in not changing direction. Furthermore, if it's true that a best-of-breed approach would save over two years in delivering GBSD, then any risk to schedule would be more than erased. Add to that the potential cost savings some industry experts have said a collaborative approach would generate, and 50 years of successful collaboration in ICBM development and sustainment by industry leaders, and you wonder why we haven't already given direction to build the ICBM dream team.

We can avoid the wall if we act quickly. Let's disengage the cruise control and build the right team. Act now.

Robin Rand was commander of Air Force Global Strike Command from 2015-2017. Michael Fortney was director of operations and vice commander of Air Force Global Strike Command from 2013-2017.

<https://breakingdefense.com/2019/11/boeing-revives-push-for-gbsd-team-with-northrop/>

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CSIS (Washington, D.C.)

North Korea's Strong Hand against the U.S.

By Sue Mi Terry

Nov. 4, 2019

*A version of this op-ed appeared online on November 1, 2019 in The Wall Street Journal.

For Halloween, Kim Jong Un gave Donald Trump a trick, not a treat: North Korea fired two short-range missiles on Thursday toward the Sea of Japan. It was North Korea's 13th weapons test this year—and the first since the Trump administration's latest attempt to restart negotiations with North Korea quietly failed a few weeks ago. The first talks between the two sides in eight months broke down after only 8½ hours in Stockholm. The North Korean delegates stalked out, and Pyongyang subsequently said they wouldn't resume the "sickening" negotiations with the U.S.

This might seem surprising since Mr. Trump has held three meetings with the North Korean dictator and has repeatedly expressed confidence that North Korea is eager to denuclearize. After his first summit with Mr. Kim, in Singapore in June 2018, Mr. Trump tweeted, "There is no longer a Nuclear Threat from North Korea."

In reality, North Korea poses a bigger threat than ever. It has continued expanding its nuclear and missile programs, and it has been testing short-range missiles that place U.S. troops in South Korea and Japan—along with those countries' civilian populations—in far greater peril. How did Mr. Trump's high-profile diplomacy with North Korea go so wrong?

The president committed a cardinal error of deal-making: He misjudged the person across the table from him. He thought that Mr. Kim had come to the negotiating table primarily because of the U.S. sanctions policy of "maximum pressure" and his own rhetoric warning of nuclear "fire and fury." Mr. Trump assumed that Mr. Kim was negotiating from a position of weakness that left him ready to make major concessions.

In Mr. Kim's mind, however, he was meeting with the U.S. from a position of strength. His nuclear and missile technology had reached the point where he could probably hit the American mainland with a nuclear-tipped intercontinental ballistic missile. He no longer needed to stage provocative tests of his technology and thought he was now in a position to gain international acceptance for North Korea as a nuclear-weapons power. He never had any intention of denuclearizing.

In part because he pays little attention to his intelligence briefings, Mr. Trump didn't understand his adversary's agenda or mind-set. He thought that he could entice Mr. Kim with the prospect of economic development: In Singapore, the president even offered a slick presentation to show the glorious future that could lie ahead for North Korea (complete with seaside condos) if only it denuclearized.

But Mr. Trump didn't grasp the essential difference between Vietnam, the site of his second summit with Mr. Kim, and North Korea. Vietnam's communist leaders implemented Chinese-style economic liberalization only after achieving their dream of unifying the entire country. Mr. Trump faces a

much more difficult task in trying to convince the North Korean tyrant to abandon the nuclear arsenal that he thinks keeps his regime safe and to open up his country while a freer, richer rival Korean state continues to prosper to his south. The Vietnamese were open to reform in victory, whereas Mr. Trump is asking Mr. Kim to make sacrifices while still vying for his survival.

Even if North Korea won't give up its nuclear arsenal, the Trump administration could still try to reach an interim deal to freeze or roll back Mr. Kim's nuclear-arms program in return for a partial lifting of sanctions. Experts still debate whether it would be worthwhile to grant North Korea targeted sanctions relief in return for pledges (verified by international inspectors) to cease further production of fissile material and to end all nuclear and missile testing.

But even if such a limited deal was possible before, it is far less likely now because Mr. Trump has raised Mr. Kim's expectations so high by saying that the two leaders were "in love," dismissing the North's short-range missile tests (in violation of U.N. sanctions) as unimportant, unilaterally canceling joint U.S.-South Korea military exercises and firing national security adviser John Bolton, whom North Korea viewed as a prime impediment to U.S. concessions.

Mr. Trump has emboldened Mr. Kim into thinking that he can achieve a significant lifting of U.S. sanctions in return for a small, symbolic step, such as announcing the shutdown of his Yongbyon nuclear facility—an important facility but only one of many in the North. Mr. Kim has shown no willingness to provide a complete inventory of his nuclear program or to allow international inspectors into his country—both prerequisites to verifying any agreement.

Mr. Trump's almost certain impeachment in the House will only raise Mr. Kim's confidence: He understands how politically imperative it will be for Mr. Trump to achieve a foreign policy "win" to distract from his deepening political woes. That helps to explain the intransigence of North Korea's negotiators in Stockholm, where they demanded maximal sanctions relief in return for minimal concessions.

With Mr. Kim feeling more confident, the U.S. is left with only two bad options: Either give North Korea massive sanctions relief up front for little in return, or watch as Pyongyang returns to testing nuclear weapons and ICBMs—or tries lesser provocations such as a medium-range missile test over Japan or a satellite launch—after the expiration of the year-end deadline that Mr. Kim gave Mr. Trump to reach a deal.

Mr. Kim is probably calculating that a return to "fire and fury" is unlikely given Mr. Trump's domestic troubles and reelection campaign and the fact that everyone else in the region has moved on; China, Russia and South Korea have no interest in ramping up tensions with North Korea. China implemented strict sanctions enforcement in 2017 but, following multiple meetings between Mr. Kim and Mr. Trump and Mr. Kim and Chinese leader Xi Jinping, Beijing has relaxed the pressure considerably. According to a recent U.N. report, North Korea continues to circumvent U.N. sanctions on shipping and trade, with North Korean vessels hauling coal to China and engaging in ship-to-ship transfers with Chinese vessels to evade sanctions. Since Mr. Kim feels that he is negotiating from a position of strength, any interim deal he would strike wouldn't put a real dent in his nuclear program—and wouldn't be verifiable.

The North Koreans' plan is to stall: show up, talk, break off talks; show up, talk, break off talks; and keep repeating as long as necessary to wait out Mr. Trump. And while they play this game, they are improving and expanding their nuclear and missile programs.

Mr. Trump's incoherent approach to North Korea has left the U.S. with few good options. Unless he is prepared to make major concessions, the North may well resume major provocations in the new year. Mr. Trump claims to be a master deal maker, but he certainly hasn't shown it in his relationship with Kim Jong Un.

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War on the Rocks (Washington, D.C.)

NATO North? Building a Role for NATO in the Arctic

By Rebecca Pincus

Nov. 6, 2019

Russia's growing military assertiveness — in Ukraine, Syria, and beyond — has sparked fears over its intentions in the Arctic. The pace of Russian bomber patrols, submarine expeditions, and firing exercises in the Arctic are all at levels not seen since the depths of the Cold War. A growing chorus is calling for NATO to take on a greater role in the Arctic to counter Russian aggression.

But the gathering storm over the Arctic is not just about Russian military activity, and framing it as such is dangerously short-sighted. Unfortunately, just as relations between Russia and the West are deteriorating, the Arctic region is undergoing a terrifying physical transformation. Arctic warming is racing ahead of our best models, burning through the system at a pace that is hard to comprehend. Parts of coastal Alaska are eroding 20 meters per year; the center of the pollock fishery in the Bering Sea is moving north 18 miles annually; and mass die-offs of seabirds, fish, and marine mammals are occurring. The Arctic is undergoing jarring changes in environmental, political, military, and economic domains — all at the same time. This transformation threatens to upend decades of stability. In this state of flux, any mishap or misunderstanding could generate enough friction to spark a serious crisis or even conflict.

Involving NATO in the Arctic, in the context of rapidly deteriorating stability, could be very dangerous. I agree that NATO should play a larger role, but this role must be carefully calibrated. NATO wears two hats: It is an operational military alliance, but it is also a formalized structure for dialogue among states, including with Russia. Increased NATO operations in the Arctic are likely to exacerbate the growing security dilemma. Instead, using NATO channels to open dialogue with Russia on Arctic security issues could add an important and badly-needed source of stability. Using the NATO-Russia Council to close the Arctic security “dialogue gap” through the creation of an Arctic security working group would be a prudent first step. However, drawbacks of greater NATO involvement should be carefully weighed. This article will explain the profound changes wracking the Arctic, sketch the security dynamics, and parse NATO's role.

What's New in the Arctic

The Arctic is undergoing transformative physical-environmental changes. Sea ice, the dominant organizing characteristic of the region, is in sharp decline. There is about half as much ice coverage in the Arctic now as the historic average, and the total ice volume has dropped by three quarters.

Economic changes are also taking place, although there is more anticipation than actual development: Russia, for example, has struggled to drive business along its Northern Sea Route (NSR). Economic transformation of the region is possible, but remains an open question tied to global market forces, technological developments, and continued environmental change. However, the Arctic remains one of the last relatively untapped resource reserves on the planet. This includes the growing and colorful business of iceberg water.

Changing physical characteristics and anticipated economic interests have seized the attention of political, military, and economic leaders from the eight Arctic states — Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russia, Sweden, and the United States

— as well as some non-Arctic states including China. While the Arctic has long been militarized, new technologies and new considerations are altering the composition and behavior of Arctic forces. Political change has also been occurring in the region, transforming the set of actors who shape debate and decisions. Increasing political participation by indigenous communities and organizations (given formal impetus by the UN Declaration on the Rights of Indigenous Peoples in 2007) has contributed to political change in the Arctic region at national, regional, and circumpolar levels.

The intersection of change in the physical, economic, political, and military domains creates complexity and great uncertainty.

A Delicate Balance of Power

No single country dominates the Arctic. For decades, the United States and Russia maintained a delicate balance of power. But in the context of the changes now occurring, that balance of power is precarious. While a dominant regional hegemon would manage change and provide some type of stability, the Arctic lacks that center of gravity, and instead faces multiple possible outcomes (as flagged in the 2009 Arctic Marine Shipping Assessment).

The two major Arctic powers — the United States and Russia — differ strongly on key issues that pertain to the future of the Arctic, including the legal status of the Northern Sea Route. Both identify as being in a competitive dyad: As part of that competition, Russia and the United States have been increasing their security presence in the Arctic. Russian fortifications on their Arctic islands have been widely analyzed: They include the construction of bases as well as installing advanced radar systems and missiles. The U.S. military will shortly be stationing F-35s at Eielson Air Force Base and work is underway to expand missile detection capabilities at Clear Air Force Station and ICBM interceptor missile defenses at Fort Greely — all in Alaska.

Therefore, in a region wracked by profound change and balanced between opposing great powers, there is potential for destabilization and a dangerous security dilemma. Where might stability and norm-setting emerge to counteract growing militarization? Could NATO serve as a source of stability?

NATO in the Arctic: Pros and Cons

Given its role as the cornerstone of Euro-Atlantic security, it might seem natural to think that NATO involvement would stabilize the Arctic. While Russia understandably views NATO as a threat, the mechanism of collective defense and the structural process-based system built by NATO provide more predictability for Russia than ad hoc arrangements. NATO could therefore be seen as a stabilizing institution that might exert a beneficial influence on the Arctic region as it undergoes profound change. Some experts have, indeed, called for NATO to take on an expanded role in the Arctic, including bringing the Arctic into NATO's holistic security approach and conducting a joint threat assessment, or by conducting surveillance and disaster-response operations.

However, two serious issues would complicate NATO's ability to provide stability and norms in the Arctic. First, NATO's involvement could dilute the influence of Arctic states. NATO is a large organization with a remit far larger than the Arctic region, and greater NATO involvement therefore risks drawing in outside states. This has traditionally been avoided by Arctic states, including both the United States and Russia. Arctic stability, and Arctic decision-making, may not benefit from the addition of the other 25 NATO states, especially those from eastern Europe, whose interests are quite different.

Second, greater NATO involvement in the region could contribute to escalation and security-dilemma dynamics. NATO is, after all, a military alliance. As NATO increases its capabilities to act in the Arctic, its capacity for interoperability, and its regional familiarity — for example, through

exercises like last year's TRIDENT JUNCTURE — it will signal that it is more of a threat to Russia. Russia is most likely to respond by stiffening its own military posture. Tit-for-tat dynamics could lead to escalation, especially in the case of accident or mishap.

A Path Forward for NATO in the Arctic

If we think of NATO as serving essentially two functions, it becomes easier to parse NATO's possible role in the Arctic. NATO is both a military-operational concept and a political-organizational concept. As a military alliance, NATO plans and exercises in order to achieve and maintain operational readiness. It also, however, structures and maintains political relationships by formalizing interaction among states, both inside and outside the alliance. Through NATO dialogue, allies speak to each other, as well as partners like Finland and Sweden — and they also speak to Russia, through the NATO-Russia Council.

The NATO-Russia Council, established in 2002 by the Rome Declaration (replacing the Permanent Joint Council), serves as a forum for consultation and joint action between NATO members and Russia. The Council is seen as having an important role in reducing misunderstandings and increasing predictability. In July 2019, NATO Secretary General Jens Stoltenberg said at the conclusion of a NATO-Russia Council meeting, "Our discussions are not easy. But they are important, especially when tensions are going up . . . they help to limit the risk of misunderstanding and miscalculation." While the secretary general was referring to discussions over Ukraine and the INF treaty, his words could also be applied to the Arctic.

The NATO-Russia Council could be a useful forum for dialogue on security topics in the Arctic, perhaps through the formation of a new working group on Arctic security. Currently, there is no security forum for the Arctic that includes Russia (the Arctic Security Forces Roundtable and the Arctic chiefs of defense (CHODs) meetings have excluded Russia since 2014). The region's governance forum, the Arctic Council, does not address security matters per its founding charter. The absence of a security forum for the Arctic creates space for misunderstanding and mistrust, the accelerant of a security dilemma.

The NATO-Russia Council could be a good choice for discussing security topics in the Arctic because it is a proven, established structure that is part of a 70-year-old institution, and is therefore more familiar and predictable than a new, untested forum that would be subject to intense shaping efforts by both sides of the U.S.-Russia dyad. On the other hand, as mentioned above, NATO includes countries far away from the Arctic. Some non-Arctic countries may have a strong interest in the region — like the UK and France — and might be important to include in an Arctic-focused security dialogue. NATO partners Sweden and Finland should be included. But not all NATO members and not all partners would have relevance.

NATO Has a (Carefully Tailored) Role in the Arctic

A greater role for NATO in the Arctic should be deliberately calibrated to build stability and positive norms — reaching back to core NATO values, and the role of NATO as a value and norm-building institution. It should be carefully constructed to avoid contributing to escalation or the development of a security dilemma. While a greater operational NATO presence in the Arctic is likely to increase tension, NATO's organizational function might serve a useful role in filling the dialogue gap on Arctic security.

The Arctic is undergoing profound environmental, geopolitical, and economic shifts. If NATO can establish its values, like the rule of law, as Arctic norms, that could help stabilize the region. In a time of complex change, the familiar, predictable NATO institution might be a good choice to begin building towards a more stable future. NATO's role in the Arctic must be shaping, not escalating.

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<https://warontherocks.com/2019/11/nato-north-building-a-role-for-nato-in-the-arctic/>

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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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