



UNITED STATES AIR FORCE
**CENTER FOR STRATEGIC
DETERRENCE STUDIES**

NEWS AND ANALYSIS

Issue 1366
17 May 2019

Feature Report

“COMBATING NUCLEAR TERRORISM: DHS Should Address Limitations to Its Program to Secure Key Cities”. Published by U.S. Government Accountability Office; May 13, 2018

<https://www.gao.gov/products/GAO-19-327>

DHS's Securing the Cities program seeks to give state and local agencies the ability to detect and deter nuclear terrorism, including dirty bombs. It provides funding for equipment, such as radiation detectors, and training for up to 5 years. Participating cities are required to submit plans and show potential future funding sources for sustaining these programs after DHS funding ends.

We found DHS does not fully track program spending and performance, and has not addressed challenges to sustaining these programs.

We made 4 recommendations, including that DHS collect more spending information and address sustainment challenges.

TABLE OF CONTENTS

NUCLEAR WEAPONS

- [US Air Force Nuclear, Space Programs Take Hit in Border Wall Reprogramming](#) (Defense News)
But the Air Force is the only service to lose funding for hardware, including nuclear and conventional weapons, surveillance aircraft updates, and space programs.
- [Perry Confirms Timetable to Move Plutonium from Nevada](#) (Las Vegas Review Journal)
... the Nevada senators said that while they appreciated Perry's engagement, "we strongly reiterated that we would be ensuring he and his department honor their agreement to remove the weapons-grade plutonium from Nevada."
- [Congress Readies for Battle over Nuclear Policy](#) (The Hill)
On issues ranging from the size of the U.S. nuclear arsenal to whether to leave open the possibility of launching a nuclear first strike, leading Democrats in the House and Republicans in the Senate have been meticulously laying out their cases.

US COUNTER-WMD

- [Commerce Bans Chinese Firms from Exporting Sensitive US Technology](#) (The Hill)
Four of the Chinese firms are being accused of attempting to procure commodities from the U.S. to support Iran's weapons of mass destruction and military programs, a violation of U.S. export rules.
- [Congress, Pentagon Renew Old Fight over 3rd Missile Defense Site](#) (Breaking Defense)
The Missile Defense Agency "has repeatedly stated that the estimated \$3-\$4 billion cost to build such a site would be better spent on improving the capabilities of the existing [Ground-based Midcourse Defense] system," said Kingston Reif ...

US ARMS CONTROL

- [European Allies Warn US over Tensions with Iran](#) (VOA)
Iranian President Hassan Rouhani warned last week that Tehran could resume uranium enrichment at a higher grade if the European powers, China and Russia did not develop a plan to thwart punitive U.S. sanctions on Iran's banking and energy sectors.
- [North Korean Weapons Launch Sends Message to South](#) (VOA)
The missile and several other rockets went up and then into the sea off North Korea's east coast. It is North Korea's first ballistic missile test in a year and a half.
- [Bill Retains Russian Nuclear Forces Limits](#) (Homeland Preparedness News)
The Richard G. Lugar and Ellen O. Tauscher Act to Maintain Limits on Russian Nuclear Forces calls for an extension of New Strategic Arms Reduction Treaty (New START) limits on Russia until 2026 ...
- [Dem Spending Bill Would Block Funds to Support Nuclear Sales to Saudis](#) (The Hill)
But lawmakers on both sides of the aisle are concerned because Riyadh has resisted the "gold standard" — prohibitions on enriching uranium and reprocessing spent fuel to produce plutonium, which are essential steps in producing nuclear weapons.

COMMENTARY

- [How Trump Can Transform Nuclear Arms Control](#) (National Interest)

It has been a decade since Washington and Moscow concluded their last nuclear accord, the so-called New START agreement, and the two powers, which still possess 95 percent of the world's nuclear weapons, are both aggressively modernizing their nuclear arsenals.

- [Countering WMD in the Digital Age: Breaking Down Bureaucratic Silos in a Brave New World](#) (War on the Rocks)

Emerging technologies will enable the rise of new, agile threats to U.S. national security, including weapons of mass destruction (WMD) — that is, nuclear, chemical, and biological weapons.

- [Congress Must Act on Arms Control with Extension of New Start Treaty](#) (The Hill)

The loss of New Start Treaty information could force the United States to significantly grow its nuclear arsenal to account for “worst case scenario” planning.

- [The Slow Death of the Iran Nuclear Deal](#) (Defense One)

Tehran says it will stop complying with elements of the accord unless the countries that remain live up to their commitments. But those five states are unlikely to stand up to U.S. pressure.

NUCLEAR WEAPONS

Defense News (Washington, D.C.)

US Air Force Nuclear, Space Programs Take Hit in Border Wall Reprogramming

By Joe Gould, Aaron Mehta, and Valerie Insinna

May 13, 2019

Correction: A previous version of this story contained an erroneous amount of reprogrammed money. The story has been updated to show the Pentagon reprogrammed \$1.5 billion in FY19 funds.

WASHINGTON — In the wake of the Pentagon reprogramming \$1.5 billion in fiscal 2019 funds to support President Donald Trump's border wall with Mexico, only the U.S. Air Force appears to be losing money appropriated for equipment updates.

The funding largely comes from personnel accounts in the Air Force, Navy and Army. But the Air Force is the only service to lose funding for hardware, including nuclear and conventional weapons, surveillance aircraft updates, and space programs.

Overall, the Pentagon reprogrammed \$818.465 million from FY19 defense appropriations, as well as \$681.535 million from FY19 overseas contingency operations accounts, or OCO, to reach that \$1.5 billion total.

Lawmakers expressed concern that the use of military resources and manpower on the southern border will damage military readiness. However, acting Defense Secretary Patrick Shanahan said last week that ongoing deployments to support the Defense Department aren't doing so.

"We've seen no degradation to readiness," he told Senate appropriators May 8 at a defense budget hearing. "In fact, in some cases, it's enhanced our readiness because the troops get to perform certain functions."

Congressional Democrats and some Republicans have objected to the administration's use of this mechanism for funding the president's border wall, arguing it bypasses Congress' constitutional power of the purse. For the second time in recent weeks, the Pentagon ignored decades of precedent and carried out the transfer of funds without first consulting with the Senate Appropriations Committee.

Sen. Patrick Leahy, the Senate Appropriations Committee's top Democrat, led a letter to Shanahan on May 10 to object to the latest instance, saying it harms hurricane cleanup at Tyndall Air Force Base, Florida.

"We are dismayed that the Department has chosen to prioritize a political campaign promise over the disaster relief needs of our service members, given the finite reprogramming authority available," the lawmakers wrote.

They noted that Shanahan's decision to notify Congress of the reprogramming came a day after he testified before the subpanel that oversees defense spending, and they wrote that they welcomed his views on "how you intend to repair the damaged relationship between the defense oversight committees and the [Defense] Department."

The letter was also signed by the Senate Armed Services Committee's top Democrat, Sen. Jack Reed, as well as Democratic Sens. Dick Durbin, Brian Schatz, Tom Udall, Patty Murray, Chris Murphy, Tammy Baldwin, Dianne Feinstein and Jon Tester.

The reprogramming could be a topic at Shanahan's future confirmation hearing for the full job of defense secretary. A date for that hearing has not been set.

Why the Air Force?

About half of the non-OCO \$818 million sum the Defense Department wants to redirect to the border comes from Air Force accounts, with space and missile programs taking the biggest hit. In total, the Pentagon expects the service to shear \$402 million off its FY19 budget.

About \$210 million would be cut from Air Force space programs, specifically the Evolved Expandable Launch Vehicle program, which funds the use of rockets that send satellites and other capabilities into space. According to the reprogramming document, one rocket launch has been canceled due to the "Space Test Program (STP)-4 satellite provider termination of the Robotic Servicing of Geosynchronous Satellites (RSGS) spacecraft," which is no longer necessary under the National Security Strategy.

The Air Force's program for modernizing its E-3 Sentry early warning aircraft — more commonly called AWACS — also could lose funding that it no longer needs in FY19.

The program, "Diminishing Manufacturing Sources Replacement of Avionics for Global Operations and Navigation," or DRAGON, updates the E-3's avionics and brings it into compliance with future air traffic control requirements. But it is moving too slowly to use all of the funds it was appropriated in FY19, so the administration aims to have \$57 million diverted for border protection.

DRAGON has been delayed for two reasons, according to the reprogramming request. First, "aircraft have been available for programmed depot maintenance" at a slower-than-planned rate, dragging out the modification schedule. Additionally, DRAGON integration can only occur after AWACS are upgraded to the Block 40/45 configuration, and not all aircraft have gone through that process.

The Air Force sees AWACS as a key part of its initial version of the Advanced Battle Management System, a family of systems that will provide ground surveillance across the different military services. Instead of retiring seven E-3s in FY18, Gen. Mike Holmes, head of Air Combat Command, said those planes could be upgraded with new sensors and communications gear.

However, DRAGON isn't the only modernization effort for the Sentry that is moving slower than expected. In November, Bloomberg reported that the service terminated a contract with Boeing to upgrade the AWACS's characteristic disc-shaped radar due to repeated delays.

Other Air Force programs that will take a hit include a planned upgrade to the Minuteman III intercontinental ballistic missile and the air-launched cruise missile programs.

A number of top defense officials previously said nuclear modernization is the top priority for the Pentagon, including Ellen Lord, the department's acquisition head, who on May 1 told Congress: "We have weapons that are decades over what was supposed to be their useful life. And we are out of time. We need to continue on the path we're on, or we are going to fall behind and not have the nuclear deterrence that we enjoy today."

The document reprograms \$24.3 million, of the \$124.5 million appropriated in FY19, from the Minuteman III Launch Control Block Upgrade program; the document claims funds are available due to a "slip in the production schedule for FY 2020."

Meanwhile, \$29.6 million — more than half of the \$47.6 million appropriated for the air-launched cruise missile programs in FY19 — will be reprogrammed. The explanation for that change: "Funds are available due to contract savings from reduced guided missile flight controller modification

requirements; and due to lack of executable requirements for Support Equipment and Low Cost Mods in FY 2019.”

The reprogramming of funds for the Hellfire missile is also notable, as the Pentagon has identified a lack of munitions stockpiles as a major issue to address in its budget request. As an example, the FY20 budget called for the maximum rate of production possible on Hellfire: \$730.8 million for 9,000 of the weapons.

The document states that funds are “available due to contract savings from all variants that provide precision kill capabilities. Savings are attributed to negotiated lower unit costs per missile system.”

<https://www.defensenews.com/smr/federal-budget/2019/05/13/us-air-force-nuclear-space-programs-take-hit-in-border-wall-reprogramming/>

[Return to top](#)

Las Vegas Review-Journal (Las Vegas, Nevada)

Perry Confirms Timetable to Move Plutonium from Nevada

By Gary Martin

May 13, 2019

WASHINGTON — Energy Secretary Rick Perry said he provided a timeline to remove weapons-grade plutonium from the Nevada National Security Site and agreed to brief the state’s U.S. senators on milestones related to that removal.

Perry and Lisa Gordon-Hagerty, who heads the National Nuclear Security Administration, toured the Nevada security site on Friday with Sens. Catherine Cortez Masto and Jacky Rosen.

The senators and other state officials raised concerns earlier this year about the unannounced shipment of one-half metric ton of plutonium into the state.

Perry, in a statement released by his office, said that during the tour with the senators, “we discussed the timeline for removing the material from Nevada.”

“Administrator Gordon-Hagerty and I reiterated our commitment to begin removal in 2021 and brief (Cortez Masto and Rosen) on major milestones related to that removal,” Perry said.

In a joint statement released after the tour on Friday, the Nevada senators said that while they appreciated Perry’s engagement, “we strongly reiterated that we would be ensuring he and his department honor their agreement to remove the weapons-grade plutonium from Nevada.”

“With Secretary Perry, we made it clear that the DOE must take the necessary steps to productively engage with state leaders and restore trust with Nevadans,” the senators said.

Those necessary steps include regular briefings by the National Nuclear Security Administration on the status and progress of the transfer of the plutonium, the senators said.

Plutonium shipped before lawsuit

The Department of Energy was under federal court order to remove one metric ton of plutonium from the Savannah River Site in South Carolina when a facility in that state to convert the nuclear weapons material into fuel was scrapped.

Last August, the Energy Department announced it would move half of the material to the Nevada security site and half to the Pantex Plant in Texas until the material could be accepted at the Los Alamos National Laboratory in New Mexico.

Nevada filed a lawsuit in federal court in Reno last November seeking an injunction to stop the shipment. The National Nuclear Security Administration notified the federal court and Nevada in January that the shipment had taken place before the state's lawsuit was filed.

Raising additional concern about the plutonium storage came with a letter from the Defense Nuclear Facilities Safety Board, dated March 21, which questioned safety evaluations and system upgrades at the Device Assembly Facility at the security site due to earthquake activity.

Earthquake hazard

"The facility continues to operate without accounting for the increase in seismic hazard and without evaluating whether the credited structures, systems and components can perform their safety function during and after a seismic event," Bruce Hamilton, chairman of the board wrote in the letter.

Perry, and the Nevada security site, said the facility is sound and the plutonium there is safely stored.

Cortez Masto, however, placed a hold on Senate confirmation of Trump administration nominees to the Department of Energy until she received assurances that the plutonium would be moved.

She reached a deal with Perry earlier this month to move the plutonium out of the state with assurances no further shipments would come to Nevada. She agreed to drop her hold on nominees.

Perry sought the tour with the senators at the facility, which he said gave them an opportunity to see classified and non-classified work at the Nevada security site which employs 3,000 workers with an economic benefit of \$900 million annually.

The secretary said the Nevada security site workforce also supports science, technical and engineering programs at universities and colleges in the state.

<https://www.reviewjournal.com/news/politics-and-government/perry-confirms-timetable-to-move-plutonium-from-nevada-1662338/>

[Return to top](#)

The Hill (Washington, D.C.)

Congress Readies for Battle over Nuclear Policy

By Rebecca Kheel

May 12, 2019

A key annual defense bill is poised to serve as a battleground over President Trump's nuclear weapons policy.

On issues ranging from the size of the U.S. nuclear arsenal to whether to leave open the possibility of launching a nuclear first strike, leading Democrats in the House and Republicans in the Senate have been meticulously laying out their cases. Those debates will come to a head soon, as the Senate Armed Services Committee begins to consider its version of the defense policy bill in two weeks.

"I think there's tremendous support on the Senate side for the triad," said Sen. Deb Fischer (R-Okla.), the chairwoman of the subcommittee in charge of nuclear weapons, referring to the three methods of delivering a nuclear weapon. "I think everybody's well aware of the importance that we make sure all three legs are strong."

The Trump administration's nuclear posture review, released February 2018, largely follows the Obama administration's nuclear modernization plans, but also calls for new weapons such as a so-called low-yield warhead and a new sea-launched cruise missile.

The Congressional Budget Office has estimated modernizing the nuclear arsenal will cost more than \$1 trillion over the next 30 years.

House Armed Services Committee Chairman Adam Smith (D-Wash.), who has long lambasted the price tag for nuclear modernization, pledged to make the issue a priority when he took control of the gavel after Democrats won back the House.

One of the first hearings Smith held as chairman was on outside experts' views on U.S. nuclear policy, and two of his major public addresses since the midterm elections have been at nuclear conferences.

In the hearing and speeches, he questioned the need for the nuclear triad, said he wants to "kill" the low-yield warhead and blasted Trump for casting aside nuclear treaties.

In late January, Smith also re-introduced his "No First Use Act" — with backing from presidential candidate Sen. Elizabeth Warren (D-Mass.) — that would make it U.S. policy not to strike first with nuclear weapons.

Smith told The Hill this week he is not yet sure what exactly he'll put in his version of the National Defense Authorization Act (NDAA), saying he is still getting a feel for where his members are on the issue.

His committee isn't scheduled to begin considering the bill until June. Generally, he said, he is eyeing three areas to address: new weapons such the low-yield warhead, the triad and nuclear dialogue with Russia and China.

"We're still in that laying out the case mode," he said. "My overarching goal here is to try to make nuclear war less likely. And there's a lot of different pieces to it, but awareness that we're stumbling into another nuclear arms race, trying to figure out what we can do to increase dialogue with Russia and China and renew arms control discussions so we don't put ourselves in that positions — all of those things are part of it."

One thing Smith did say is likely to be in the bill is language supporting the New START Treaty, which caps the number of deployed nuclear warheads allowed to the United States and Russia. The treaty is up for extension in 2021, and Trump has indicated he wants China to join the pact as a condition for renewal — something supporters of the treaty describe as a "poison pill."

"I think we'll probably have some statement on New START, an expression that we need to stay in it," Smith said. "If we need to update it fine, but let's not abandon arms control discussions."

At the nuclear hearing, Smith said he did not think intercontinental ballistic missiles — the ground component of the triad — are necessary for U.S. nuclear deterrence because of the air and sea components.

Smith later walked the comment back, saying at one of his speeches he wasn't sure if the best approach to reduce the size of the arsenal is to eliminate a leg of the triad or cut the number of warheads from each, but not before he got fierce backlash from Senate Republicans.

Fischer issued a statement in March saying Smith's comments were "dangerous" and "misguided."

Asked this week if she thinks the Senate version of the NDAA should include language to pre-empt anything the House might try, Fischer did not directly answer, but highlighted that Senate

Democrats such as Sen. Martin Heinrich (N.M.), the ranking member of her subcommittee, have expressed support for the triad.

Senate Armed Services Committee Chairman Jim Inhofe (R-Okla.) has also dedicated many of his questions to witnesses this year to building a case against Smith.

At a hearing with the U.S. general in charge of the nuclear arsenal, Inhofe noted that “some are saying that is an area where we could be making cuts at this time” and asked about the significance of nuclear modernization and keeping all three legs of the triad.

“It is the most important element of our national defense,” U.S. Strategic Command chief Gen. John Hyten replied on modernization. On the triad, he added, “because of the capabilities of each leg of the triad, I have the ability to respond to any threat.”

Asked recently about his line of questioning at hearings and his plans for the defense bill, Inhofe said he hopes to address the “slight disagreement” between him and the House on the issue.

“All of the witnesses have been and said that’s the great single threat that we are facing today,” he said. “I think that we could put to bed the idea that we’re not going to continue with or re-enact our modernization program to put ourselves ahead of our opposition that’s out there being very busy, both Russia and China.”

“I think the main thing is we have the triad,” he added. “That means three, and we got to keep all three defenses out there and in a position that we can use them hoping that it will not be necessary. But if we don’t have them, it would be necessary.”

<https://thehill.com/policy/defense/443197-congress-readies-for-battle-over-nuclear-policy>

[Return to top](#)

US COUNTER-WMD

The Hill (Washington, D.C.)

Commerce Bans Chinese Firms from Exporting Sensitive US Technology

By Emily Birnbaum

May 13, 2019

The Commerce Department on Monday announced that it is banning six Chinese firms from exporting sensitive U.S. technologies, accusing the companies of attempting to procure commodities from the U.S. to aid groups in Iran and China.

The department said it is placing the six companies on its banned “Entities List,” alongside one Pakistani company and five people from the United Arab Emirates.

The companies and people will no longer be able to export “sensitive” U.S. technologies.

Four of the Chinese firms are being accused of attempting to procure commodities from the U.S. to support Iran’s weapons of mass destruction and military programs, a violation of U.S. export rules.

And the other two Chinese companies allegedly helped facilitate the delivery of controlled technology to groups affiliated with China’s armed forces, according to the Commerce Department.

“We are putting individuals, businesses, and organizations across the world on notice that they will be held accountable for supporting Iran’s WMD [weapons of mass destruction] activities and other

illicit schemes,” Secretary of Commerce Wilbur Ross said in a statement. “Moreover, we cannot allow China’s civil-military integration strategy to undermine U.S. national security through prohibited technology transfer plots orchestrated by state actors.”

The bans come as the U.S. and China have intensified their trade war with new rounds of tariffs. Trade talks broke down last week without a deal between the world's two largest economies.

The move also comes as the U.S. ramps up an aggressive strategy against Iran.

The banned Chinese entities include Avin Electronics Technology Co. Ltd., Longkui Qu, Multi-Mart Electronics Technology, Taizhou CBM-Future New Material Science, Tenco Technology and others.

<https://thehill.com/policy/technology/443381-commerce-department-bans-chinese-firms-from-exporting-sensitive-us>

[Return to top](#)

Breaking Defense (Washington, D.C.)

Congress, Pentagon Renew Old Fight over 3rd Missile Defense Site

By Paul McLeary

May 10, 2019

CAPITOL HILL: Despite mounting frustration here, a wary Pentagon has blown past a 60-day window imposed by Congress to deliver a plan for a long-debated East Coast ballistic missile interceptor site.

The Pentagon has long worried about the multi-billion dollar price tag that comes along with building a new interceptor field and its infrastructure, and has generally had little to say to lawmakers demanding answers. The Missile Defense Review released earlier this year also called into question the need to build a third domestic interceptor field.

But that hasn’t stopped Congressional delegations from New York, Ohio, and Michigan — the states with locations still in the running for any future work — from demanding answers. And they want those answers before the 2020 defense budget markups begin.

“Our congressional intent was very clear,” Rep. Elise Stefanik, a Republican who represents the New York location at Fort Drum, admonished Missile Defense Agency chief Lt. Gen. Samuel Greaves Wednesday. “The environmental impact study was funded and authorized by Congress. That has been completed. The Secretary of Defense sat in this very committee room and said on record, under oath, that he would meet our request to voluntarily provide that information to Congress.”

The 2018 NDAA gave the Pentagon 60 days after the delivery of the Missile Defense Review to submit a location to Congress. The review was released in January. But the document also said it was kicking off a series of six-month reviews on what might be need to be set up or modernized to meet missile threats.

“Let me make it perfectly clear,” Stefanik added. “Our expectation is that we will hear from the Secretary of Defense what the preferred site is.”

The sites still under consideration are the Fort Custer Training Center in Augusta, Mich., Camp Garfield in Ohio, and Fort Drum, NY.

The Congressional Budget Office estimated in 2012 that it would cost \$3.6 billion over five years to build the site and buy 20 interceptors, but that doesn’t include upkeep and sustainment costs.

The Missile Defense Agency “has repeatedly stated that the estimated \$3-\$4 billion cost to build such a site would be better spent on improving the capabilities of the existing [Ground-based Midcourse Defense] system,” said Kingston Reif, director for Disarmament and Threat Reduction Policy at the Arms Control Association. “That the Pentagon punted, at least for now, on this issue goes to show how expensive and rightly controversial it is.”

Proponents of the third site had a brief glimmer of hope on May 1 however, when Acting Defense Secretary Patrick Shanahan — who was formally nominated for the job on Thursday — told Ohio Rep. Tim Ryan, a Democrat whose district includes the Ohio site that he would give him an answer “today.”

But that answer never came. A congressional staffer told me the DoD informed lawmakers Shanahan “misspoke” and “no decision has been made or will be made until the Trump Administration first determines whether an East Coast Missile Defense site is even necessary.”

Asked to clarify matters, a Pentagon spokesperson said the only statement the department would make is already in January’s Missile Defense Review, referring questions to the Missile Defense Agency. Mark Wright, spokesman for the agency, said via email, “at this time, I don’t have anything to add beyond what the Missile Defense Review has already said about this.”

So, what does the review say? Essentially, the Pentagon isn’t ready to make a decision. Since the Pentagon has already wrapped up its environmental study of the three sites, that work “will enable DoD to shorten the deployment timeline should the United States determine that threat conditions warrant building a new interceptor site. In the event of such a decision, the location selected for the site will be informed by multiple pertinent factors at the time.”

But there are options other than building a brand-new base, says Tom Karako, director of the Missile Defense Project at the Center for Strategic and International Studies.

“If you want to replicate Fort Greely,” which already houses 26 interceptors, “you’re looking at several billion dollars of infrastructure,” which the Pentagon might not have the stomach for.

Instead, the US should consider a transportable option with a small footprint for an East Coast missile defense capability, Karako said. It would use the same interceptors that are in the ground in Alaska and California but be truck-mounted so it can move between locations. Going mobile would carry a price tag “in the millions and not in the billions, plus you’re not tied to a particular location.”

But Congressional delegations want infrastructure spending in their districts, something the mobile systems wouldn’t provide. To put it more baldly, lawmakers want money spent in their districts where their constituents would benefit.

In a March 26 letter sent to Shanahan by the Ohio delegation, lawmakers pointed out that if their site were selected, it would bring 2,300 construction jobs to the presidential battleground state, along with up to 850 full-time employees.

Rep. Mike Turner, ranking member of the House Armed Services strategic forces subcommittee, told Greaves this week he’s ready for a decision.

“You have three communities that are vying for this — two need to be let go,” the Republican said. “Two need to be able to be told they can stand down, and their communities and their chambers of commerce and everybody else who’s working to advocate for their community needs to understand that actually a decision has been made because you’ve completed all the data work necessary for that decision.”

<https://breakingdefense.com/2019/05/congress-pentagon-renew-old-fight-over-3rd-missile-defense-site/>

[Return to top](#)

US ARMS CONTROL

VOA (Washington, D.C.)

European Allies Warn US over Tensions with Iran

By Ken Bredemeier and Nike Ching

May 13, 2019

STATE DEPARTMENT —

Top officials from the European Union are calling on the United States to use "maximum restraint" and avoid military escalation with Iran.

"[U.S. Secretary of State] Mike Pompeo heard very clearly from us — not only from myself but also from the other ministers of EU member states — that we are living in a crucial, delicate moment where the most relevant attitude to take — the most responsible attitude to take — is and we believe should be that of maximum restraint and avoiding any escalation of the military side," Federica Mogherini, the European Union's foreign policy chief, said Monday in Brussels.

Mogherini, NATO Secretary General Jens Stoltenberg and foreign ministers from Britain, France and Germany spoke with U.S. Secretary of State Mike Pompeo after he canceled a stop in Moscow.

The chief U.S. diplomat shared intelligence and details about Iran's recent "escalating threat" with European allies, blaming Tehran for failing to choose talks over threats.

"The secretary wanted to share some detail behind what we have been saying publicly. We believe that Iran should try talks instead of threats. They have chosen poorly by focusing on threats," State Department Special Representative for Iran Brian Hook said Monday in Brussels.

UAE claim

Pompeo also discussed while in Brussels reported attacks on several oil tankers off the coast of the United Arab Emirates, said Hook, who declined to comment when asked if the U.S. believes Iran is behind those attacks.

The United Arab Emirates (UAE) said Sunday that four commercial vessels were sabotaged near Fujairah emirate. Monday, Saudi Arabia said two of its oil tankers were among those attacked and described it as an attempt to undermine the security of crude supplies amid tensions between the United States and Iran.

"We discussed what seemed to be attacks on commercial vessels that were anchored off of Fujairah," Hook said. "We have been requested by the UAE to provide assistance in the investigation, which we are very glad to do."

Britain, France and Germany also voiced new support on Monday for the international pact to curb Iran's nuclear weapons program.

British Foreign Secretary Jeremy Hunt called for "a period of calm."

"We are very worried about the risk of a conflict happening by accident with an escalation that is unintended on either side but ends with some kind of conflict," Hunt said.

German Foreign Minister Heiko Maas said Berlin "still regards this nuclear agreement as the basis for Iran not having any nuclear weapons in the future and we regard this as existential for our security." He said Germany is "concerned about the development and the tensions in the region, that we do not want there to be a military escalation."

French Foreign Minister Jean-Yves Le Drian said the U.S. move to ramp up sanctions against Iran to curb its international oil trade "does not suit us."

Iran nuclear deal

Iranian President Hassan Rouhani warned last week that Tehran could resume uranium enrichment at a higher grade if the European powers, China and Russia did not develop a plan to thwart punitive U.S. sanctions on Iran's banking and energy sectors.

The U.S., which withdrew from the 2015 international deal to curtail Iran's nuclear ambitions, has moved the USS Abraham Lincoln aircraft carrier strike group and four B-52 bombers to the Middle East region, in response to concerns Iran may be planning an attack against American targets. The Pentagon announced Friday its intent to move additional firepower into the Middle East, including the USS Arlington and a Patriot missile battery.

The U.S. and Iran continue to trade warnings.

Monday, U.S. President Donald Trump said at the White House that Iran would be making a big mistake if it tries anything against the U.S.

Tehran issued an explicit threat over the weekend, saying the U.S.'s increased military presence in the Gulf is now a target for Iran.

"An aircraft carrier that has at least 40 to 50 planes on it and 6,000 forces gathered within it was a serious threat for us in the past but now ... the threats have switched to opportunities," said Amirali Hajizadeh, head of the Revolutionary Guard's air force. "If [the Americans] make a move, we will hit them in the head."

Pompeo is heading to Sochi on Tuesday for meetings with Russian President Vladimir Putin and Foreign Minister Sergey Lavrov.

Pompeo's trip comes a few weeks ahead of a Group of 20 summit meeting in Osaka, Japan, with both Trump and Putin expected to attend.

Trump said Monday that he will meet with Putin on the sidelines of G-20 summit.

<https://www.voanews.com/a/european-allies-warn-us-over-tensions-with-iran/4915417.html>

[Return to top](#)

VOA (Washington, D.C.)

North Korean Weapons Launch Sends Message to South

By William Gallo

May 7, 2019

On May 4, Kim Jong Un watched North Korean forces fire a new short-range ballistic missile, experts said. The missile and several other rockets went up and then into the sea off North Korea's east coast. It is North Korea's first ballistic missile test in a year and a half.

The launch appears to violate U.N. Security Council resolutions that ban North Korean ballistic missile activity.

The office of South Korean President Moon Jae-in said it is "very concerned" the North Korean missile test violates the spirit of the inter-Korean agreements.

But U.S. President Donald Trump and other U.S. officials quickly suggested the test was not very important. They said the North did not violate its own promise to stop tests of intercontinental ballistic missiles, or long-range ballistic missiles. However, some experts warn that position could frighten U.S. allies because short-range weapons could still hit South Korea and Japan.

North still upset about exercises

Robert Carlin is a North Korea scholar writing for the website 38 North. He says the North Korean test was probably a way to show anger toward the South Korean government for continuing joint military exercises with U.S. forces. Last month, Kim called the exercises "hostile acts."

North and South Korea did agree last April to stop "all hostile acts" against each other and eliminate the "danger of war." But they never signed an agreement to stop military exercises completely, and drills have continued on both sides.

North Korea also blames Moon for not acting on the inter-Korean agreements reached during three meetings over the past year. However, U.S. and international trade limits have prevented Moon from following through on many parts of the agreements.

Any time, any place, we can talk

The North Korean weapon launch puts additional pressure on Moon. His public approval rating was very high after his first meeting with Kim. Now it is half of what it was.

Adding to Moon's problems, South Korea's economy unexpectedly lost value in the first quarter of 2019.

A growing number of South Koreans oppose his contact with the North. They see it as unexperienced and unsuccessful.

Moon still wants to work with the North. He said last month he would hold a fourth top-level meeting with Kim "any time, any place."

I'm Jill Robbins.

William Gallo reported on this story for VOA News. Jill Robbins adapted it for Learning English. Kelly Kelly was the editor.

<https://learningenglish.voanews.com/a/north-korean-weapons-launch-sends-message-to-the-south-/4907432.html>

[Return to top](#)

Homeland Preparedness News (Washington, D.C.)

Bill Retains Russian Nuclear Forces Limits

By Douglas Clark

May 13, 2019

Reps. Michael McCaul (R-TX) and Eliot L. Engel (D-NY) introduced last week a measure designed to retain Russian nuclear forces limits.

The Richard G. Lugar and Ellen O. Tauscher Act to Maintain Limits on Russian Nuclear Forces calls for an extension of New Strategic Arms Reduction Treaty (New START) limits on Russia until 2026, unless Russia violates the Treaty or until a new agreement is in place that provides equal or greater constraints, transparency and verification measures.

“The New START Treaty has aided global security for nearly a decade, limiting Russia’s ability to deploy nuclear weapons,” McCaul, lead Republican of the House Foreign Affairs Committee, said. “So long as Russia remains compliant, it’s in America’s national security interest to extend this Treaty because it will help prevent Vladimir Putin from enhancing his arsenal. Specifically, our legislation encourages the Administration to negotiate an extension to the New START Treaty, as long as it maintains the strongest possible enforcement and verification methods.”

McCaul said if Russia is serious about reducing the threat of nuclear weapons use, its leaders should take the opportunity and prove commitment to nuclear non-proliferation.

“Vladimir Putin’s aggression against the United States and our allies demands that we take all possible steps to defend our national security from Russian actions,” Engel, House Foreign Affairs Committee chairman, said. “This bill sets out to achieve the same goals that Sen. Lugar and Rep. Tauscher prioritized in their public service: the responsible control of Russian arms to ensure the United States’ ability to maintain a strong nuclear deterrent.”

<https://homelandprepnews.com/stories/33848-bill-retains-russian-nuclear-forces-limits/>

[Return to top](#)

The Hill (Washington, D.C.)

Dem Spending Bill Would Block Funds to Support Nuclear Sales to Saudis

By Rebecca Kheel

May 9, 2019

A spending bill released Thursday by House Democrats would restrict the Trump administration from selling nuclear technology to Saudi Arabia.

“None of the funds appropriated by this act should be used to support the sale of nuclear technology to Saudi Arabia,” the draft bill text reads.

The provision was included in the House Appropriation Committee’s bill to fund the State Department and foreign operations for fiscal 2020.

Overall, the bill would provide \$56.4 billion for the State Department and foreign operations, casting aside President Trump’s request to slash spending at State by 21 percent.

The inclusion of the Saudi provision comes as the administration has been trying to negotiate what's known as a 123 agreement with the Saudis to allow U.S. companies to sell nuclear reactors to the kingdom.

"Given the administration's failure to share important information about these activities with Congress, we included this provision to prevent the administration from selling nuclear technology to Saudi Arabia," a House Democratic aide told The Hill. "We hope this will force much-needed transparency on this issue."

The Trump administration argues a nuclear energy deal with Saudi Arabia is necessary because the nation will turn to other countries, leaving U.S. businesses in the lurch and doing nothing to prevent nuclear proliferation.

But lawmakers on both sides of the aisle are concerned because Riyadh has resisted the "gold standard" — prohibitions on enriching uranium and reprocessing spent fuel to produce plutonium, which are essential steps in producing nuclear weapons.

And even as the 123 agreement remains under negotiation, Energy Secretary Rick Perry approved seven so-called Part 810 authorizations that allow U.S. companies to share certain unclassified nuclear energy technology with Saudi Arabia.

Democrats accused the administration of using the Part 810 authorizations to circumvent Congress, which has statutory authority to review and potentially block 123 agreements.

The Department of Energy holds that 810 authorizations and 123 agreements are "are two distinct and different processes based on two separate sections of the Atomic Energy Act," with Perry telling lawmakers approving Part 810 authorizations is "something that goes on every day."

Congress has also been seething over the Saudis' killing of U.S.-based journalist Jamal Khashoggi last year at the Saudi consulate in Istanbul.

That anger, combined with concern over civilian casualties in Yemen's civil war, led Congress to pass a resolution this year that would have ended U.S. military support for the Saudi-led coalition in Yemen.

Trump vetoed the resolution, and the Senate did not have the two-thirds majority required to override.

<https://thehill.com/policy/defense/442920-dem-spending-bill-would-block-funds-to-support-nuclear-sales-to-saudis>

[Return to top](#)

COMMENTARY

National Interest (Washington, D.C.)

How Trump Can Transform Nuclear Arms Control

By Richard Burt and Jon Wolfsthal

May 10, 2019

President Donald Trump has tweeted that he wants to prevent a dangerous and costly nuclear arms race between the United States and Russia, and prevent a new one with China, by negotiating a new three-way treaty among those nuclear states.

The president's new interest in nuclear arms control, in part, may stem from the conclusion of the Mueller investigation. Thus, he may believe he now has some political room to work on issues of importance with Russia and possibly explore a new, historic nuclear reduction deal.

Whatever the reason, this new interest should come as welcome news.

It has been a decade since Washington and Moscow concluded their last nuclear accord, the so-called New START agreement, and the two powers, which still possess 95 percent of the world's nuclear weapons, are both aggressively modernizing their nuclear arsenals.

For Russia, this work includes a new generation of "heavy" intercontinental-range missiles and completely new systems, such as long-range underwater drones and nuclear-powered cruise missiles. America's modernization program would replace its entire nuclear "triad" of land and sea-based missiles and long-range bombers at a cost of \$1.5 trillion or more.

Reflecting on both the dangers and the costs involved in another round of the arms race, the president now says he wants far-reaching new agreements with Russia that would bring China into the process for the first time.

Trying to halt Russian nuclear modernization and expanding arms control to China is a big idea, and a good one. Especially, in the case of China, however, it is extremely ambitious: China's nuclear arsenal is a tenth the size of the Russian and American inventories, and Beijing would never accept an outcome that locked it into an inferior status to Washington and Moscow.

The problem is not with the big idea, but in going big too soon. Trying to expand nuclear deals to include China now may seem like a good idea, but in practice, it will have little or no chance of being achieved. Rather the problem with the president's concept is trying to do too much too soon. Our experience in the arms control over the last thirty years suggests a more measured, three-phase approach makes more sense and can achieve the same outcome albeit on a longer time-scale. This plan gets the president where he wants to go and where, in our view, the nation needs to go.

In the first phase, as early as the Osaka G-20 meeting in late June, Trump and Vladimir Putin should agree to the immediate and unconditional extension of the New START accord. Now set to expire in 2021, the agreement can be extended without Congressional or Russian Duma approval by another five years. This would guarantee nuclear predictability well into the next decade. Republicans and Democrats in the Senate should welcome a move they already approved in 2010.

Extending New START would enable the two sides to quickly enter the second phase—expanding and deepening nuclear reductions with Russia. The goal should be to reduce American and Russian deployed nuclear warheads down to approximately 1000 each, building on the New START framework. But this is not enough. A new U.S.-Russian negotiation would also need to address

additional issues of concern for both parties. For Washington, this would include Russia's considerable advantage in shorter-range "sub-strategic" weapons that threaten our allies in Europe and Asia and our forces deployed abroad. Moscow, for its part, will want to limit U.S. missile defense systems, as well as a new generation of conventionally-armed, precision-strike weapons.

None of this will be easy and, as has been the case in the past, a new American-Russian agreement could take years to achieve. But if the two sides are able to reduce their strategic offensive forces down to lower levels while also expanding limits to include tactical weapons and missile defense systems, then we believe the stage will be set for the third phase of the process, bringing China into the mix.

This is only likely to happen if the reductions laid out in a new agreement are enough to entice the Chinese. But it will be important for Washington and Moscow to keep their expectations realistic. China, at least at the outset of any negotiating process, will probably only be prepared to discuss general principles for nuclear restraint rather than strict, verifiable limits. But even this would be an important achievement, as would real discussions about strategic doctrine governing possible nuclear use and escalation.

Thus, implementing the next big idea in arms control—achieving American, Russian and Chinese nuclear limits—will neither be quick nor easy. But that does not suggest that it should not be pursued. The challenge is not with the President's instincts in this area, but with his approach—one that can be modified to make real progress. But any serious effort along these lines needs to recognize that the first step is the extension of the existing New START treaty. Without this, all the rest probably becomes impossible. The president now has the opportunity not only to rescue nuclear arms control but to transform it. He should seize it.

Richard Burt led the American delegation that negotiated the START agreement signed by President Bush and President Gorbachev in 1991. Jon Wolfsthal served as senior director for arms control and nonproliferation at the National Security Council and helped negotiate the New START agreement. Both are leaders of the Global Zero arms control initiative.

<https://nationalinterest.org/feature/how-trump-can-transform-nuclear-arms-control-56892>

[Return to top](#)

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

Countering WMD in the Digital Age: Breaking Down Bureaucratic Silos in a Brave New World

By Natasha E. Bajema

May 13, 2019

Imagine reading a news article that begins: "Terrorists delivered a biological weapon at a local sports stadium using a drone swarm, unleashing widespread panic and mass casualties." The article reveals that a terrorist cell claimed credit for the attack, declaring it launched the drone swarm using a smartphone. Law enforcement officials determined that the group purchased off-the-shelf drones, leveraged a free, open-source swarming program, and used a DNA desktop synthesizer and information acquired online to produce the genome of a dangerous pathogenic virus. The group claimed it managed to insert the virus DNA into a cell and scale it up in a garage biolab. Authorities have no leads on the exact location from which the terrorists remotely launched their attack since the drones do not emit communication signals emanating from the drones. The terrorists left no evidence of their physical presence at the stadium — indeed, they may have planned and executed the attack from miles away.

Although this news story is fictional, the potential for non-state actors to carry out such an attack today is real. A new “species” of emerging technologies — additive manufacturing, advanced robotics, artificial intelligence, and synthetic biology — is empowering smaller groups and individuals to acquire technologies that were previously beyond their reach. As a group of researchers with the World Economic Forum suggests, these technologies are contributing to a collapse of barriers between the digital and physical, and between the synthetic and organic.

Emerging technologies will enable the rise of new, agile threats to U.S. national security, including weapons of mass destruction (WMD) — that is, nuclear, chemical, and biological weapons. States and non-state actors will increasingly take advantage of the asymmetric capabilities and competitive advantages available to them in both the physical and digital domains.

Policymakers should reconsider how they organize the national security enterprise for the digital age. In this essay, I compare how digitization will affect different “weapons of mass destruction,” focusing on nuclear and biological weapons. Specifically, I examine the availability of digital information, the automation of capabilities that could aid in the development of these weapons, and the move toward autonomous capabilities.

But these new technologies have yet to disrupt how national security policymakers think about and organize the government to counter WMD. Unlike nimble non-state adversaries, governments depend on longstanding definitions and organizational structures, efficient bureaucracies, and clear authorities to function properly. Despite the looming breakdown of longstanding boundaries in the WMD space, the U.S. government remains firmly committed to well-established bureaucratic silos of excellence, which, for example, keep “all things cyber” bureaucratically separate from WMD. Ultimately, the digitization of WMD requires a significant rethinking of the U.S. government’s increasingly arbitrary, outdated bureaucratic categories — collapsing the unhelpful distinctions between biotechnology and bioweapons, and between cyber and WMD, while recognizing that the divergent weapons that make up the longstanding category of “WMD” should be treated as distinct challenges in the age of digitization.

Blurring of Boundaries — Let’s Get Digital

Digitization refers to the blurring of boundaries between the digital and physical worlds caused by the conversion of physical things into digital information, increasing connectivity across electronic devices, and greater autonomy of machines. These days, it seems like anything can be expressed as digital code: genomes of living organisms, homemade plastic guns, do-it-yourself drone designs, nuclear power plant parts, jet engine parts for commercial aircraft, missile parts, and even brain waves. Physical-to-digital conversion technologies, such as gene sequencing and 3D printing, turn physical matter into digital information that computers can read, analyze, and share. Gene sequencing involves converting genes or entire genomes from living organisms into digital information, while 3D printing (also known as additive manufacturing) similarly converts physical objects into digital information. As greater volumes and varieties of digital information become available, the distinction between physical objects and digital information and the role of physical constraints such as national borders become less meaningful.

But digitization is more than just converting physical matter into bits. It also entails automating manual processes that previously required skilled labor, making physical objects capable of sending and receiving information over the Internet, and allowing automated systems to be controlled over the Internet by remote users. Paul Scharre and Michael Horowitz define automated systems as software or hardware that perform a function for some period of time, then stop and wait for human input before continuing. These systems contain “embedded expertise” and empower greater numbers of individuals to achieve results that once required a high degree of skill and knowledge.

Nicholas Negroponte suggested in *Being Digital* that bits “comingle effortlessly” with each other, allowing us to consume and use the same digital information on a growing range of automated devices. This feature has led to the networking of greater numbers of physical objects over the Internet — i.e., the Internet of Things.

Finally, as founding editor of *Wired* magazine Kevin Kelly suggested in 2014, the next step for digitization will be giving electronics cognitive abilities to achieve greater autonomy. Unlike the rule-based software of the past, machine learning algorithms are capable of learning concepts and solving problems from patterns found in massive data sets. These tools give machines the ability to perform functions with limited human oversight.

The Digitization of WMD

How will the phenomenon of digitization affect U.S. adversaries’ ability to develop or deliver nuclear and biological weapons? Many emerging technologies with the potential to shape the development and use of WMD have digital components and automated and connected to the Internet. The connection between cyber and physical systems facilitates easy transfer of information and makes technologies capable of having physical impacts through digital pathways. Moreover, as more electronic devices become smart, they are exposed to cyber vulnerabilities that have plagued computing devices for decades.

For example, drones, a potential platform for the remote delivery of WMD, contain operating software and hardware, transmit many types of data, and rely upon GPS for navigation. Operators can crash drones into buildings and infrastructure to cause physical effects from remote locations. 3D printers can be connected to the Internet, which could allow nefarious actors to circumvent traditional suppliers by reverse engineering and producing WMD-related parts. Further, the potential for cyberattacks on design software and networked machines creates new risks to supply chains for weapons programs.

The three categories of WMD — nuclear, chemical, and biological weapons — have different levels of susceptibility to the dangers of digitization. For nuclear weapons, the production of weapons-usable nuclear material represents the primary barrier to creating the capability. Producing the requisite fissile material for a nuclear bomb requires access to raw materials, significant resources (money, electricity, etc.), uranium enrichment and/or reprocessing facilities, and extended periods of time. No level of digitization is likely to alter these physical requirements.

In contrast, synthetic biology has practically transformed the life sciences into a branch of information technology, with implications for actors seeking to develop both biological and chemical weapons. Genome-sequencing technologies read DNA sequences and convert them into digital information, while gene synthesis technologies essentially do the opposite — allowing scientists to translate digitized genomic data from a computer into physical DNA sequences. Taking these sequences, scientists can modify or recreate living organisms in a lab environment. Many of these organisms are capable of producing chemical compounds, circumventing the need for chemical synthesis. In this way, synthetic biology has the potential to digitize the development of chemical weapons as well.

Nuclear weapons

Although nuclear weapons remain far more resistant to digital technologies than biological weapons, policymakers may face some new and significant digital/physical challenges in several areas: proliferation, supply chains, command and control, and deterrence. Given the overwhelmingly physical nature of a nuclear weapons program, the main effects of digitization will be through increased availability and quantity of digital information and greater autonomy.

The first digitization challenge to nuclear weapons involves risks posed by the proliferation of digital information as a result of 3D printing. 3D printing or additive manufacturing refers to a growing family of technologies through which material is added gradually, layer-by-layer. These technologies allow physical objects to be converted into digital information, giving anyone with access to a computer, a 3D printer, and the Internet the ability to create and share physical things over digital pathways.

Additive manufacturing is especially advantageous for the nuclear weapons and nuclear energy sectors, which do not enjoy the benefits of economies of scale. 3D printing allows companies such as the United Kingdom's Sellafield Ltd and Siemens to design one-off solutions to solve nuclear-specific challenges while saving money, reducing part production times, and increasing safety. For example, in 2014, Sellafield used 3D printing to support the decommissioning and disposal of nuclear waste at the nuclear power plant. The company used a 3D scanner to capture the dimensions of a container for radioactive material, designed a digital model for a lid that would fit the container perfectly, and printed the lid, saving both time and money that would be required if they used traditional tooling. In 2017, Siemens installed the first 3D-printed replacement part in a nuclear power plant in Slovenia. Although these are innocuous examples, they indicate the start of a trend that will expand as more sensitive parts are produced for nuclear reactors.

The nuclear weapons sector is also harnessing the advantages of additive manufacturing. Within the U.S. nuclear weapons complex, the Kansas City National Security Campus, for example, has used 3D printing for more than a decade to produce non-nuclear components to improve the design, prototyping, and manufacture of nuclear weapons fixtures, achieving a savings of more than \$45 million. Lawrence Livermore National Laboratory and Sandia National Laboratories are working to refurbish components of the W80 nuclear warhead, several of which will be 3D-printed. Meanwhile, a warhead being developed for hypersonic weapons by a defense contractor will contain three major parts produced with 3D printers.

As companies and militaries integrate 3D printers into their operations to produce sensitive parts, they are contributing to a growing repository of digital build files, much like Word and PowerPoint documents. These files — designed, tested, and qualified by scientists and engineers — embed a certain level of technical expertise in electronic form, which means individuals without the requisite skills can produce parts by loading up a 3D printer with the required raw materials and then pressing the “print” button. To be sure, we are not yet at the point where additive manufacturing technologies can fully circumvent the skills needed for post-processing and assembly of WMD. However, the technologies are advancing. If states and non-state actors are able to hack companies' or militaries' computer systems and get access to these digital build files, they may be able to skip critical steps in developing parts required for nuclear reactors or nuclear weapons.

Similarly, digital pathways may allow actors to circumvent the need for skilled engineers and scientists in their pursuit of nuclear weapons. In the past, policymakers worried about brain drain — the idea that underpaid scientists and engineers might be persuaded to assist states or non-state actors in developing nuclear capabilities. In the future, the commercial value of digital information combined with the anonymity afforded by the Internet may change the incentives for nuclear experts considering sharing technical expertise. Once a digital file is created, most of the work is done (except of course, for transmission costs and the materials required for its conversion to physical form). Selling additional copies of the digital file involves almost zero transaction costs when compared to producing, selling and transporting physical parts.

The use of additive manufacturing to produce sensitive parts for nuclear reactors or nuclear weapons also opens up additional digital pathways for sabotage of supply chains — through design

software, printer firmware, and the machines themselves. Complex systems such as nuclear weapons and command and control systems contain many digital components assembled in complicated supply chains. These can be compromised by adversaries through the introduction of malicious code.

Recently declassified records demonstrate that a single part malfunction can lead to a false launch warning of a missile launch, or simply to the loss of communication with nuclear forces. On June 3, 1980, early warning computers at the North American Aerospace Defense Command (NORAD) detected a nuclear attack from the Soviet Union. National Security Advisor Zbigniew Brzezinski was about to wake up President Jimmy Carter to order to launch a massive retaliation when a subsequent phone call indicated a false alarm. A later investigation found that the false alarm was caused by a defective 46-cent computer chip in a communications device. More recently, in 2010, NORAD lost its communication link to 50 ICBMs for more than an hour due to a hardware malfunction at a launch control center at Warren Air Force Base in Wyoming.

The risk of defective parts raises the risk of false alarms and communication failures. Moreover, if an adversary wanted to undermine the effective operation of U.S. nuclear weapons in the event of a crisis, tampering with the supply chain could offer a lucrative pathway.

In addition to the potential for theft of digital know-how, digitization in the area of autonomy has implications for nuclear deterrence. To deter adversaries, a nuclear-armed state depends on a reliable and invulnerable second-strike force to retaliate against any potential nuclear attack. Nuclear-powered ballistic missile submarines often assume this role because adversaries don't know where they are. But what if the seas become transparent and nuclear submarines become detectable? A combination of advanced undersea technologies, including autonomous drones and sonar nodes, may undermine the stealth and invulnerability of submarines. In this way, undersea transparency could undermine deterrence and increase the risk of nuclear war.

Sophisticated drones, ranging from semi-autonomous to fully autonomous systems, also offer new potential delivery platforms for nuclear weapons, creating both offensive and defensive risks. As Zak Kallenborn and Philipp Bleek point out in their recent piece, Russia is considering underwater autonomous drones for the delivery of nuclear weapons. AI-enabled autonomous systems come along with an extensive list of operational risks, which are severely exacerbated by their integration into nuclear weapons systems. On the defensive side, the risk of hacking and disruption of communication links may jeopardize the effective operation of semi-autonomous systems.

Increased autonomy will also lead to troubling offensive risks including program malfunctions that might occur within a complex system, unanticipated interactions with the environment, loss of command and control, and the potential for runaway escalation, and unintended use of nuclear weapons by autonomous systems.

Biological weapons

In contrast to nuclear weapons, the technologies underlying biological weapons have already become quite digitized. Whereas fissile material remains physical in every respect, the starting point for a biological weapon, a dangerous pathogen, can now exist as digital information — i.e., genomic data.

Over the past several years, dramatic reductions in the cost of DNA sequencing and synthesis, computing power, and data storage have enabled scientists to read greater numbers of gene sequences and living organisms' genomes and convert this information into genomic data. Scientists around the world can access this growing volume of genomic data through online databases to construct new genes and DNA sequences of interest, and potentially create living organisms from scratch.

Rather than acquire physical samples of pathogens, researchers can now search these online catalogues for sequences. Meanwhile, biotechnology companies are building their own proprietary collections of genomic data to produce consumer products. These collections of data have huge potential commercial value, and their accessibility on networks and the Internet makes them vulnerable to hacking, theft, and sabotage. To be sure, this information can be encrypted and protected against cyber intrusions, but in digital form the information is easier to transfer, steal, or sabotage.

As a result, it is increasingly possible to acquire the digitized genomes of dangerous pathogens and recreate them in a lab environment. This became possible as early as 2002, when scientists created an active polio virus from scratch through chemical synthesis. Then, in 2010, J. Craig Venter's team became the first scientists to create a living organism from computer data. More recently, scientists at the University of Alberta in Canada pieced together the genome of the horsepox virus, seeking to help develop more effective vaccines for its close relative, the variola virus, which causes smallpox. Over the course of six months, scientists ordered DNA sequences of the virus by mail, put them together, and synthesized the virus in the lab. The project cost only about \$100,000.

The trend toward automation also appears to be breaking down the longstanding barrier of hands-on lab knowledge, acquired through learning by example or "a lengthy process of trial-and-error problem solving." A number of desktop machines such as bioprinters and DNA sequencers are leading to substantial de-skilling in fields that previously required years of trial and error. At the push of a button, individuals with less expertise can achieve results comparable to highly educated scientists. For example, last year, scientists invented an easier, faster, and more accurate method for synthesizing DNA that could eventually lead to the development of desktop DNA printers for use in research labs. In the past, scientists had to synthesize short sequences and assemble genes by stitching them together, which required much trial and error, time, and toxic chemicals. The new technique would allow less skilled scientists to skip that difficult step and make it easier for them to engineer new living organisms.

Although these machines do not fully eliminate the need for expertise, the Internet is making it easier to acquire such knowledge. In recent years, scientists have started transferring skills by uploading video recordings of themselves conducting experiments to YouTube. Using a more sophisticated model, the Journal of Visualized Experiments has published over 8,000 professional videos of scientific experiments from laboratories around the world to improve scientific education.

In the future, genomic data, gene editing tools such as CRISPR, and machine learning tools may assist nefarious actors interested in developing more effective biological weapons. Online databases containing genomic data will grow rapidly, as will the availability and sophistication of bioinformatics tools for modeling, modifying, and designing living organisms. As Kolja Brockman, Sibylle Bauer, and Vincent Boulanin suggest, machine learning tools will help scientists more quickly identify the functions of genes and the genetic markers for diseases, allowing for personalized treatment. However, these same tools could be used to enhance existing pathogens as biological weapons or identify populations susceptible to certain diseases in order to develop biological weapons capable of targeting specific individuals or groups.

Nuclear weapons reside at one end of the spectrum as the most "physical" weapons of mass destruction and biological weapons at the other end as the most digital, with chemical weapons somewhere in between (This article has focused on these two categories of WMD in order to examine the more extreme ends of the spectrum). In most cases, the development and use of all types of WMD will continue to depend primarily on physical pathways, materials, components, equipment and facilities. However, resourceful adversaries may soon leverage digital information to achieve their objectives.

The Way Forward

The trend toward digitization in the WMD space presents policymakers with a fundamentally new set of challenges. Digitization allows nefarious actors to move fluidly between the digital and physical worlds, circumventing efforts to counter WMD proliferation in ways that the U.S. defense enterprise is not prepared to manage. As these weapons become less physical and more digital, policymakers will have to grapple with securing digital information, countering proliferation activities over digital pathways, and protecting against vulnerabilities introduced by connection to the Internet and other networks.

Policymakers can start addressing the new risks posed by digitization in three ways. First, they should abandon the use of the terms “WMD” and “countering WMD.” For decades, these terms have obscured important differences among nuclear, chemical, and biological weapons and silos have grown up around them within the U.S. government. Emerging technologies are exacerbating the distinctions between these weapons, but bureaucratic structures force the U.S. government to treat them as if they pose similar challenges. As this article has shown, digitization is changing the threat of nuclear weapons, biological weapons, and chemical weapons in very different ways, exacerbating pre-existing technical differences. At the same time, other boundaries — e.g., the separation between WMD and cyber threats — have become increasingly artificial.

Second, policymakers should remove the bureaucratic barriers between biotechnology and biological weapons, and instead take an overarching strategic approach to the risks and opportunities the life sciences pose for defense. Here, digitization is increasing the overlap between sectors rather than accentuating the differences. Diane DiEuliis wrote in *War on the Rocks* last year about the bureaucratic separation within the Department of Defense across the various service labs, the undersecretary for research and engineering, and the undersecretary for acquisitions and sustainment for managing the risks of biological weapons and leveraging the potential of the biotechnology sector for the battlefield. This separation, she argued, has led to the absence of strategic guidance for the development of these new technologies at the national level.

Among other things, this siloing has prevented policymakers from treating genomic data as a strategic asset. Policymakers might consider developing new standards of practice among scientists and bio-industrial companies to better protect all types of digitized genomic data. They should also consider adopting the advanced encryption algorithms used in the financial sector as a way of protecting digitized genomic data. This will require striking a balance between the need for security and the scientific community’s ethos of openness, sharing, and collaboration.

Finally, policymakers should explore removing the bureaucratic barriers between cyber and WMD — e.g., the assistant secretary for homeland defense and global security is responsible for both cyber policy and countering WMD, but both are handled by different deputy assistant secretaries of defense. Of course, this is easier said than done. As an initial step, though, the government could consider how to integrate cyber experts into WMD-related offices to address both the physical and digital dimensions of the WMD threat. Eventually, it will be essential to ensure collaboration and information-sharing between and among cyber and WMD professionals in the government. Removing these bureaucratic barriers will help policymakers better investigate the national security implications of cyber-physical systems that may be used to produce sensitive parts for nuclear weapons or to remotely access WMD-related facilities to cause harm. In addition, the government should invest in additional cybersecurity measures to protect against supply chain risks and unauthorized access of industrial control systems.

The digital age has produced a brave new world of nuclear, chemical, and biological risks. It is time to move beyond long-established silos in the national security mission space and break down the

bureaucratic barriers that are preventing the U.S. government from taking effective action to prevent the use of the world's most devastating weapons.

Dr. Natasha E. Bajema is a senior research fellow at the Center for the Study of Weapons of Mass Destruction and leads a multi-year initiative on the impact of emerging technologies on WMD called "Emergence and Convergence." Dr. Bajema has more than 19 years of WMD-related expertise, including serving on extended detail assignments within the Pentagon and the National Nuclear Security Administration.

<https://warontherocks.com/2019/05/countering-wmd-in-the-digital-age-breaking-down-bureaucratic-silos-in-a-brave-new-world/>

[Return to top](#)

The Hill (Washington, D.C.)

Congress Must Act on Arms Control with Extension of New Start Treaty

By Pranay Vaddi

May 9, 2019

The leaders of the House Foreign Affairs Committee exhibited bipartisan cooperation in advancing international security interests by supporting extension of the New Start Treaty. It prevents a nuclear arms race between the United States and Russia and gives the United States key information about Russian nuclear weapons, reasons why Pentagon leaders strongly endorse it. By introducing a bill to push for renewing the New Start Treaty before it will expire in 2021, Chairman Eliot Engel and Ranking Member Michael McCaul give Republicans and Democrats a way to support the newfound desire of President Trump to reduce global nuclear dangers.

The White House reportedly wants to negotiate bold new arms control agreements with Russia and China. Since the New Start Treaty entered into force, Russia has continued nuclear modernization and introduced several new nuclear weapons systems. China has continued to increase its arsenal of mostly conventional armed ballistic missiles, creating additional risks for American forces and those of our allies across the Pacific region. Members of both parties should support efforts to address these threats. However, these negotiations could be very complicated and, if history is any guide, finalizing new arms control agreements could take years.

Extending the New Start Treaty buys time for the administration to seek new agreements. Conducting arms control negotiations with the safety net of limits on deployed weapons and verification and intelligence monitoring provisions under the New Start Treaty will make such efforts easier. This more recent White House perspective stems from worries of the cost of a nuclear arms race. The loss of New Start Treaty information could force the United States to significantly grow its nuclear arsenal to account for "worst case scenario" planning. American military leaders recognize this danger and support the New Start Treaty. They also see no need to deploy nuclear weapons beyond its limits, as evidenced in the nuclear posture review. In pushing for extension, Engel and McCaul are helping President Trump meet his goal of stopping a nuclear arms race.

The House bill is named for the late Senator Richard Lugar of Indiana and Congresswoman Ellen Tauscher of California, a Republican and Democrat who each understood the importance of bipartisan cooperation on arms control. Lugar had a long career advocating for nuclear nonproliferation that was capped off by his partnership with John Kerry to shepherd the New Start Treaty through the Senate in 2010, bringing a dozen Republican colleagues with him to support

ratification. Tauscher, who joined the State Department in 2009 as the most senior arms control official after leaving Congress, helped push the New Start Treaty through the Senate, leaning on years of legislative engagement with the nuclear laboratories in her district and the relationships with her former Republican colleagues.

The bill identifies the potential risks to international security of allowing the New Start Treaty to lapse in 2021. It requires the administration to report to Congress on the state of national security should the New Start Treaty lapse. How may allies react to its expiration? Can the intelligence community manage the loss of information about Russian nuclear forces, and at what cost? Will the United States be better off without the New Start Treaty, as opposed to if it were extended? Indeed, these are leading questions, but the answers will demonstrate the clear value of extending the New Start Treaty, along with the inherent key risks should it lapse.

President Trump can extend it with the stroke of a pen. Difficult politicized Senate advice and consent votes during an election year are not required. However, Republican support for the New Start Treaty in Congress is an important signal to voters and the policy mutable commander in chief that it is important to national security and worthy of preservation. At a time when the world looks to Washington for signs of American leadership to lower the risks of nuclear war, Engel and McCaul truly act as statesmen. It is my hope that this is the first of many more examples of Republicans joining Democrats to support the extension of the New Start Treaty.

Hopefully more Republicans see McCaul is not damaging his relationship with his voters or President Trump by publicly supporting arms control, but is helping rebuild nonpartisan interest in and support for prudent arms control policy. In the spirit of Senator Lugar and Congresswoman Tauscher, Democrats and Republicans should work together on nuclear arms control, beginning with the extension of the New Start Treaty.

Pranay Vaddi is a fellow in the nuclear policy program at the Carnegie Endowment for International Peace. He served as an adviser on the New Start Treaty and worked on arms control issues at the State Department.

<https://thehill.com/opinion/international/442872-congress-must-act-on-arms-control-with-extension-of-new-start-treaty>

[Return to top](#)

Defense One (Washington, D.C.)

The Slow Death of the Iran Nuclear Deal

By Ankit Panda

May 9, 2019

The 2015 Iran deal is dying—not with a bang, but with a series of whimpers. Known as the administration announced that the United States would stop complying with its commitments under the agreement and reimpose sanctions on both Iran and, eventually, those who do business with the Islamic Republic.

Exactly President Hassan Rouhani announced a phased set of measures that would suspend some of Iran's commitments under the agreement, while underscoring that Tehran remained within the JCPOA. He said Tehran would immediately stop observing limits on building up its domestic stockpiles of low-enriched uranium—the kind suitable for reactor use, but not weaponization—and heavy water. After a 60-day period, unless the other signatories of the accord—Britain, France, Germany (the so-called E3), China, and Russia—managed to deliver on economic benefits in the oil

and banking sectors, Tehran would suspend further compliance with sections of the JCPOA, Rouhani added.

Rouhani's announcement implicitly made clear recent developments that forced Tehran's hand. On May 3, a State Department said that the U.S. would sanction any individuals or entities involved with the JCPOA-permitted uranium swaps (allowing Iran to send enriched uranium out of its borders in exchange for natural uranium). The statement also noted that the storage of heavy water in excess of current limits would not be permitted by the United States, nor should "any such heavy water ... be made available to Iran in any fashion."

In effect, however expensive continued compliance with the deal might have gotten for Iran after the Trump administration reimposed sanctions last year, the U.S. had now sought to change the very terms of compliance—even though it is no longer party to the pact. The remaining countries, try as they might, have been unable to present Iran with a sufficiently robust solution that would work around the reimposed sanctions.

As a result, Rouhani's decision to underscore that at the end of the 60-day period Tehran might overshoot existing heavy water and low-enriched uranium limits conveys precisely to the E3, Russia, and China where the blame for its decision should rest: with the United States. Make no mistake: These steps announced by Rouhani would measurably degrade the nonproliferation effectiveness of the JCPOA and, over time, breaking the enriched-uranium-stockpile limit in particular would serve to shorten Tehran's breakout time to a single weaponized nuclear device, if a political decision to pursue that path were to be made. Because all the remaining parties to the agreement would seek to avoid that outcome, Iran might hope it is creating the right set of incentives for the E3, Russia, and China to independently seek a rollback from the United States.

The E3+2 remain committed to preserving the JCPOA as agreed in 2015. However, where Iran might have miscalculated in an attempt to increase the urgency with which the remaining parties react is in what it said will come after the 60-day period. Rouhani announced that should the remaining parties fail to fulfill their commitments to Iran—specifically on oil and banking, two areas hit hardest by last year's U.S. sanctions—Tehran would also cease observing JCPOA limits of enrichment levels and roll back modernization of the heavy-water IR-40 reactor at Arak. These measures raise the greatest proliferation concern, and Iran's following through on them would take the JCPOA past a point of no return. Most importantly, if the International Atomic Energy Agency "snap back" pre-2015 nuclear sanctions on Iran. This was always intended to serve as a measure to punish Iran for noncompliance; its use would be agnostic to the reasons why Tehran chose to abjure its commitments. Moreover, the Trump administration would get a vote, given the U.S. seat at the Security Council.

In Shakespearean terms, the tragedy of the JCPOA is halfway through the fourth act—the falling action that followed last year's climactic decision by the United States to gut any value the agreement had for Iran with the reimposition of sanctions. Even while Rouhani emphasized that the 60-day period was designed to allow for negotiations between the E3+2 and Iran, it's unlikely that Tehran will win back the sanctions benefits it was supposed to receive under the original deal. In the meantime, while Iran seeks to make clear that its actions are a reaction to U.S. policy, diplomatic brinkmanship with the remaining parties and, more seriously, violating the deal in ways that increase proliferation concerns will serve to vindicate and empower American hawks, many of whom have been counting on Iran to lash out at the JCPOA over the "maximum pressure" campaign.

Tehran didn't take the bait and announce a complete withdrawal from the agreement, but expect to see the deal's critics, including U.S. National Security Adviser John Bolton and Secretary of State Mike Pompeo, seize on Rouhani's announcement to shore up the narrative that Iran is not to be trusted. For months, U.S. officials have misrepresented the U.S. intelligence community's view that

Iran remained in compliance with the JCPOA. Now the Trump administration will have additional ammunition to claim—with no basis—that Iran’s noncompliance is a sign that Tehran seeks to rapidly lurch toward the bomb. Preserving the verified limits on Iran’s civil nuclear program that the JCPOA conferred was never a priority for this administration; instead, as Pompeo said last year, the source of Iran’s troubles was “the revolutionary nature of the regime itself.”

The most serious concern now is that the 60-day period elapses without any satisfying result to whatever E3+2 and Iran negotiations might occur, and Tehran pushes through enrichment limits and takes steps to reverse the disablement of facilities at Arak. Given a measurable increase in proliferation risks as a result of these actions, the well-known views of influential members of the administration such as Bolton, and rising tensions between the two countries, the odds of a military conflict grow.

A serious crisis with Iran would not require the total demise of the JCPOA. What makes Iran’s decision to voluntarily announce a suspension of its compliance so risky is the cover it might provide to an administration already motivated by regime-change animus to make the case to the American public that Iran is not to be trusted. As far as the administration will be concerned, the “maximum pressure” campaign prosecuted against Iran over the past year worked—not because it was ever meant to bring Iran to the negotiating table to reach a new agreement, but because it got Iran to begin a unilateral move away from compliance with the JCPOA.

Ankit Panda is a senior editor at The Diplomat, covering Asia-Pacific security and North Korea’s ballistic-missile and nuclear-weapons programs.

<https://www.defenseone.com/ideas/2019/05/slow-death-iran-nuclear-deal/156870/?oref=d-river>

[Return to top](#)

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."

DISCLAIMER: Opinions, conclusions, and recommendations expressed or implied within are solely those of the authors and do not necessarily represent the views of the Air University, the United States Air Force, the Department of Defense, or any other US government agency.