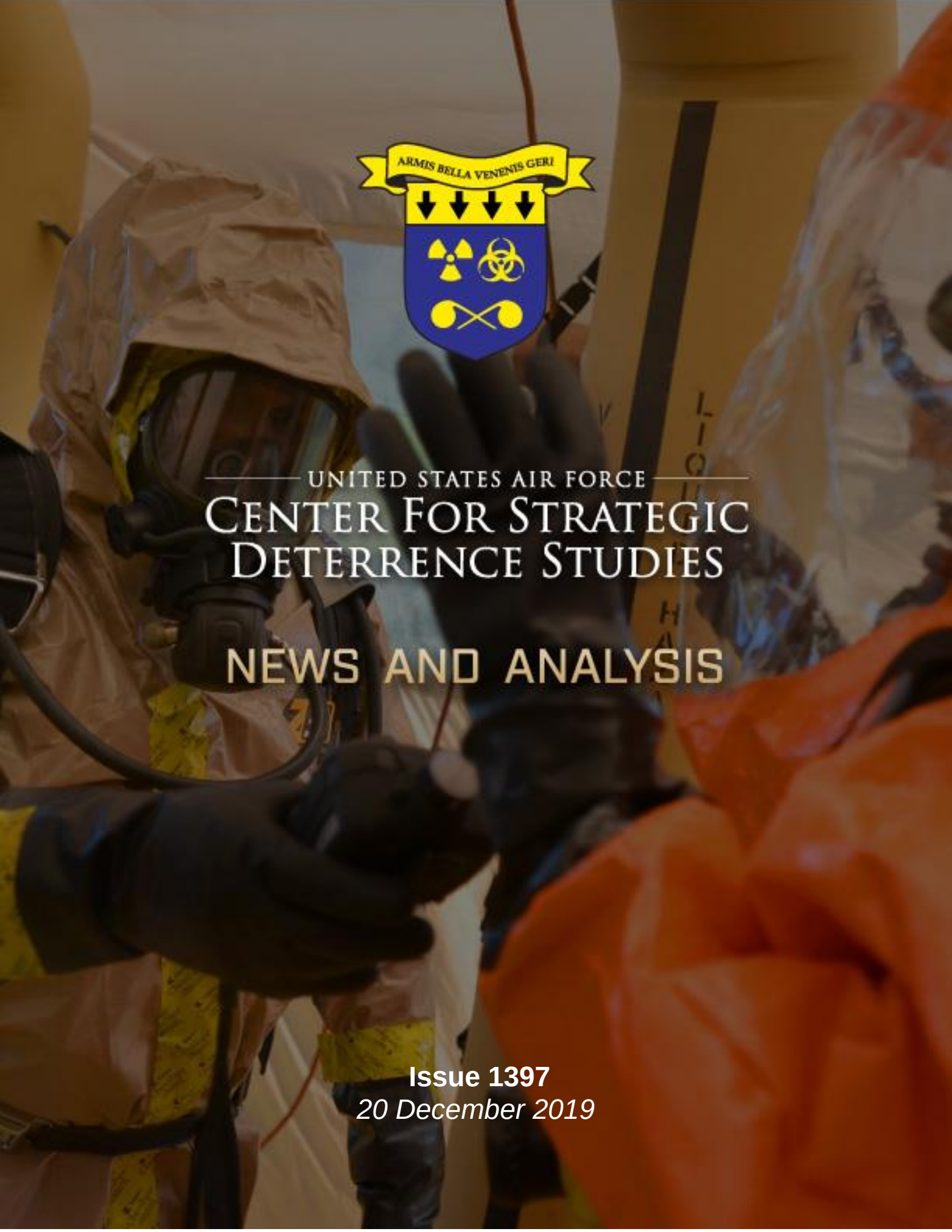

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Feature Report

"Strengthening the Economic Arsenal: Bolstering the Deterrent and Signaling Effects of Sanctions". Elizabeth Rosenberg and Jordan Tama; published by Center for a New American Security; Dec. 16, 2019

https://www.cnas.org/publications/reports/strengthening-the-economic-arsenal

As Elizabeth Rosenberg and Jordan Tama note in this timely and valuable paper, "economic sanctions have become the tool of choice for U.S. policymakers to influence international affairs." Far from being derided as ineffective, sanctions now seem to be viewed as capable of delivering success on national security problems as diverse as malicious cyber activity, election interference, trade in conflict diamonds, and bribery and corruption. Indeed, the repeated invocation by the Trump administration of "maximum pressure" to describe its sanctions strategy involving Iran, North Korea, and Venezuela suggests a view that more sanctions invariably yield more success.

But this view of sanctions—as a magic elixir that can cure any foreign policy ill, particularly if applied copiously—is as mistaken as the view that sanctions never work. Such measures are not a universally effective tool of foreign policy. They are never effective on their own, and for many of the national security problems we confront as a country, sanctions are not particularly well suited to the task.[1]

A realistic view of when sanctions are effective and, even more important, how to make them more effective, is sorely needed. This paper makes a significant contribution toward that effort.

Rosenberg and Tama highlight the importance of credibility and calibration in the application of sanctions, clear communication to the regulated community, and deterrence-based enforcement. In so doing, they provide a very useful and sensible roadmap for policymakers and sanctions administrators to follow when considering whether, and in what way, to use sanctions to advance U.S. foreign policy goals. If measures such as these are employed more sensibly, they will be more effective; and if they are more effective, sanctions ultimately may come to be viewed in their proper place in our national security tool box—as neither ineffectual nor omnipotent, but powerful complements to other tools when used in the right way against the right targets.

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NUCLEAR WEAPONS

Defense News (Washington, D.C.)

Nuclear Weapons Get Small Boost in Budget Deal

By Aaron Mehta

Dec. 17, 2019

WASHINGTON — Nuclear weapons received a small boost in a new spending deal passed by Congress, with lawmakers largely leaving the agency in charge of America's warheads alone.

Nuclear weapons programs under the National Nuclear Security Administration's purview came in at $12.457 billion, a small bump from the $12.408 billion requested for that account in the president's budget request. That figure represents an increase of $1.347 billion from fiscal 2019 levels.

Overall, NNSA's budget increased by $219 million over the president's budget request. The plus-up should help the agency with bills caused by the two-month continuing resolution, which hit at a time NNSA is attempting to balance priorities: fixing aged infrastructure and fulfilling a number of warhead modernization programs.

Notably, the W87-1 program, which seeks to modernize the warheads used for America's intercontinental ballistic missiles, received $112 million — but only 75 percent of that funding can be accessed by the agency until a report on the program arrives on Capitol Hill, and specifically addresses "all major design decisions that have been made or that remain open and a description and explanation of the cost trade-offs for each decision or potential decision including surety architecture, technologies, and potential component re-use," according to the spending deal.

This comes just days after a top NNSA official told reporters that the W87-1 program may go through design changes, including dropping planned features to defray costs for the B61-12 and W88 Alteration 370 warheads, which have been forced over-budget by problems with commercially built parts.

The bill also directs $5.6 million to stand up a new focus inside NNSA's Research, Development, Test, and Evaluation office in order to contribute to the Pentagon's ongoing analysis of alternatives for a new sea-launched cruise missile. That weapon, first proposed in the Nuclear Posture Review in February 2018, is expected to use a modification of the W80 warhead.

Within 90 days of the bill becoming law, NNSA is supposed to brief appropriators in both chambers on the status of that analysis of alternatives, and what options are under consideration.

And within 180 days, NNSA must deliver a report on the estimated cost and schedule of such a weapon, as well how it will impact existing work.

On the Pentagon side, funding for the Ground Based Strategic Deterrent program, which will replace the Minuteman III ICBM, was cut from $570.37 million in the president's request to $557.49 million; however, that cut was largely due to reductions to the technology contract provided to Boeing, which was ended early.

Funding for the B-21 bomber program was also cut by $21.4 million from the president's requested figure.

Meanwhile, the National Defense Authorization Act, which passed the Senate on Tuesday and is expected to be signed by President Donald Trump before the end of the week, includes language

making the undersecretary of defense for acquisition and sustainment responsible for nuclear command and control, which had previously been under the chief information ifficer's portfolio.

The NDAA also does not include language, initially sought by House Democrats, that would bar the deployment of the W76-2, a low-yield warhead for placement on submarine-launched ballistic missiles.

https://www.defensenews.com/smr/nuclear-arsenal/2019/12/17/nuclear-weapons-get-small-boost-in-budget-deal/

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Santa Fe New Mexican (Santa Fe, N.M.)

Final Defense Budget Nearly Doubles Spending on Pit Production

By Scott Wyland

Dec. 11, 2019

The U.S. House on Wednesday passed a military spending bill that could pump $712 million into weapons-grade plutonium operations, with the aim of having Los Alamos National Laboratory and a South Carolina site produce a combined 80 nuclear cores per year by 2026, a target that critics and some federal agencies call unrealistic.

The National Defense Authorization Act — the proposed $738 billion defense budget for 2020 — would funnel roughly $2.7 billion to Los Alamos National Laboratory. That includes $253 million to process plutonium and produce pits, the grapefruit-sized cores that detonate nuclear warheads.

The bill, which passed the House on a 377-48 bipartisan vote, is expected to sail through the Senate by early next week and go to President Donald Trump to sign.

The Pentagon and Trump administration want to boost the country's nuclear arsenal in response to what military leaders say is a growing threat from Russia, China, Iran and North Korea improving their first-strike capabilities.

Trump's 2018 Nuclear Posture Review, a document outlining the nation's nuclear strategy, calls for LANL to produce at least 30 plutonium pits per year by 2030 and the Savannah River Site in South Carolina to make 50 pits per year. That's a step up from the Obama administration wanting the two sites to be able to manufacture 50 to 80 pits per year by 2030.

The target date has since been shortened to 2026 for the Los Alamos lab to make 30 pits annually that are suitable for weapons.

Watchdog groups have lambasted what they say is a hawkish administration trying to launch a post-Cold War arms race that Los Alamos, with its aging facilities and ongoing safety and operational problems, is not equipped to handle.

"The Russians have a pit factory and we do not, and that's what this is all about," said Greg Mello, executive director of the nonprofit Los Alamos Study Group. "It's a competition with Russia. But we don't need to cram more pit production in a 40-year-old building with a lot of problems. Los Alamos is the wrong place."

A lab spokesman said officials are committed to the goal of producing 30 pits per year by 2026 and remain confident that goal is achievable.

Some House members sought to spend less on pit production and limit the plutonium work to Los Alamos.

But the Senate's proposal to put $712 million toward making Los Alamos and the Savannah River Site capable of making pits for nuclear weapons won out. It nearly doubles the $362 million allocated for pit operations in 2019.

Democratic U.S. Rep. Ben Ray Luján of New Mexico, whose district includes Los Alamos, applauded all the funding authorized for the lab.

"Los Alamos National Laboratory is an integral part of the local economy by employing thousands of New Mexicans and supporting small businesses across the state," Luján said Wednesday in a statement. The spending bill passed by the House recognizes the essential role the lab plays in national defense, he added.

New Mexico's senators have said that funding the lab and pit production for the nuclear stockpile is important for national security.

"The senators support Los Alamos National Laboratory's national security role … while maintaining the highest level of worker and community safety," the offices of Sens. Tom Udall and Martin Heinrich said Wednesday in a joint statement.

However, the senators have "significant concerns" about the Department of Energy's efforts to split the plutonium work between Los Alamos and South Carolina, "an additional level of complication that will make safety and oversight more challenging and cost taxpayers twice as much," the statement said.

Udall recently said in news reports that he would prefer Los Alamos to be the sole site producing pits for nuclear warheads. If Savannah River produces pits, all the plutonium waste would go to New Mexico's storage site without any of the economic benefits.

But Mello contends Udall, Heinrich, Luján and Gov. Michelle Lujan Grisham all have indicated they are open to Los Alamos cranking out more than 30 pits if possible.

Udall's office didn't immediately respond to emailed questions on whether the senators want Los Alamos to produce more than 30 pits.

An Energy Department budget plan calls for annual funding increases to propel Los Alamos toward the 30-pit target, climbing to more than $1 billion in 2024.

The lab has had problems with handling the waste it now generates — with mislabeling, shipping problems and safety issues. Scott Kovac, research and operations director for Nuclear Watch New Mexico, said he has concerns about how it will deal with increased plutonium work that generates even more waste.

"I don't think they're ready for increased pit production," Kovac said.

https://www.santafenewmexican.com/news/local_news/final-defense-budget-nearly-doubles-spending-on-pit-production/article_5dee4602-1b87-11ea-866d-0bb6bfe42738.html

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Defense News (Washington, D.C.)

With Boeing No-Bid, Northrop Is the Likely Maker of US Air Force's Next-Generation ICBMs

By Valerie Insinna

Dec. 14, 2019

WASHINGTON — Boeing declined to bid on the U.S. Air Force's Ground Based Strategic Deterrent program by the deadline of Dec. 13, leaving Northrop Grumman as the de facto winner of the contract.

At play is an $85 billion award to design the Air Force's next-generation intercontinental ballistic missiles, which will replace the Minuteman III. Northrop and Boeing each were awarded contracts in 2017 for the technology-maturation and risk-reduction phase of the program — meaning Boeing's departure leaves the Air Force with only Northrop as an active bidder.

"Boeing is disappointed we were unable to submit a bid to the GBSD solicitation," the company wrote in a statement. "We have been proud and honored to contribute to the ICBM mission for more than 60 years. Boeing continues to support a change in acquisition strategy that would bring the best of industry to this national priority and demonstrate value for the American taxpayer."

In a statement, the Air Force confirmed that it had received only one proposal. A spokesman for Northrop Grumman confirmed the company had bid on the competition.

"To date, the competitive Technology Maturation and Risk Reduction phase has provided the DoD with an unprecedented amount of technical and cost knowledge," wrote Air Force spokeswoman Capt. Cara Bousie in a statement. "The Air Force will proceed with an aggressive and effective sole-source negotiation. We remain on track for a contract award in the fourth quarter of Fiscal Year 2020."

Boeing's no-bid on the competition was not surprising. The company announced in July that it would not bid on GBSD unless the Air Force made changes to its acquisition strategy. Specifically, Boeing claimed that Northrop's purchase of one of the only two U.S. solid-fuel rocket motor manufacturers — Orbital ATK, now known as Northrop Grumman Innovation Systems — gave the company an unfair advantage in terms of being able to offer the lowest-cost system.

It called on the Air Force to level the playing field. "We lack confidence in the fairness of any procurement that does not correct this basic imbalance between competitors," Boeing Defense and Security head Leanne Caret stated in a July 23 letter, adding that the current acquisition strategy gave Northrop "inherently unfair cost, resource and integration advantages."

Boeing then pushed the Air Force to mandate a joint bid with Northrop. Ultimately, the Air Force declined to intervene, and Northrop chose its own industry team, which did not include Boeing as a supplier.

Then, in October, the Air Force stopped funding Boeing's technology maturation and risk reduciton contract.

During a news conference at the Dubai Airshow in November, Caret told reporters she was still hopeful the Air Force would modify its acquisition plan, though she acknowledged that the service showed no signs of doing so.

"We've continued to make certain that we've provided opportunities that if they would make those changes, [they] would allow us to bid. It is my deepest hope that we see those changes made because there is nothing more that I would like than to be able to bid on this program," Caret said.

https://www.defensenews.com/air/2019/12/13/with-boeing-no-bid-northrop-is-the-likely-maker-of-the-air-forces-next-generation-icbms/

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Breaking Defense (Washington, D.C.)

US Busts INF Wall with Ballistic Missile, Puts Putin & Xi on Notice

By Paul McLeary

Dec. 12, 2019

WASHINGTON: In a clear signal to Moscow, Beijing, and Pyongyang this morning, the Pentagon again showed it plans to leave the INF treaty behind by launching a prototype ballistic missile that blew past the old pact's range limits.

In the second test of its kind since the US pulled out of the Intermediate-Range Nuclear Forces treaty in August, the prototype ballistic missile flew more than 500km before crashing into the ocean, as planned, while "data collected and lessons learned from this test will inform the Department of Defense's development of future intermediate-range capabilities," Pentagon spokesman Lt. Col. Robert Carver said in a statement.

In a previous test conducted just two weeks after withdrawing from the treaty, the Navy launched a Tomahawk Land Attack Cruise Missile from an island off the California coast, marking the first time a missile breached the 500-5,000km range barred by the treaty, putting competitors on notice that the US was ready to push ahead quickly.

Both tests were run in partnership with the Strategic Capabilities Office.

In it's 2020 budget request, the Pentagon asked for $96 million to continue research and begin testing ground-launched missiles that break the INF's previously restrictive bounds. But any plans to buy one of these missiles in the near-term at least appears to be on hold until Capitol Hill understands the Pentagon's plans a little better.

The US tested a cruise missile that would have exceeded the limits of the INF treaty.

Congress blocked spending any fiscal 2020 funds on buying or fielding intermediate-range ballistic or cruise missiles. The prohibition is included in the 2020 National Defense Authorization Act agreed to Monday, just hours before the Army tested one of the competitors in it's competition for a next-generation long-range missile. That does not bar prototypes or other research ands development work. The Pentagon can keep working on them for the next year, but must submit a report to Congress with an Analysis of Alternatives for a future INF-busting missile.

Lawmakers also want more information on potential basing options in Europe and a rundown of what conversations the Pentagon has had with allies about plans for basing and deployment locations in the future.

Asked about possible deployments of the new missiles during a visit by the Czech defense minister to the Pentagon today, Defense Secretary Mark Esper said, "once we develop intermediate-range missiles and if my commanders require them, then we will work closely and consult closely with our allies in Europe, Asia, and elsewhere with regards to any possible deployments."

As far as what kind of missile was fired today, Kingston Reif of the Arms Control Association said "it was probably some kind of Frankenstein using existing boosters and components. Of particular

interest is whether it used anything from the Missile Defense Agency, especially given Russia's claims that certain US missile defense programs violated the treaty."

Reif called the test "more significant" than August's Tomahawk launch since a ground-launched intermediate-range ballistic missile "could promptly strike deep into Russia, China, and North Korea." That, of course, is exactly the capability the Pentagon wants.

The NDAA sends the message that Congress wants answers to questions about the rationale and concept of operations for the missiles, not least of which is what allies would be willing to host such missiles. While the chairman of the HASC, Adam Smith, is a proponent of arms control, that is not true of his Senate counterpart, Sen. Jim Inhofe, and the NDAA language is a clear compromise that leaves the military considerable room for maneuver.

At Vandenberg, the 30th Space Wing worked with the SCO on the new missile's launch preparations and data collection, and has been working on post-INF launches since the US suspended its participation in the treaty in February.

"The National Defense Strategy provides very clear direction to restore our competitive edge in the reemergence of great power competition," 30th commander Col. Anthony Mastalir said in a statement. "We owe it to our nation to rapidly evolve and develop our capacity to defend."

https://breakingdefense.com/2019/12/pentagon-busts-though-the-inf-wall-puts-putin-and-xi-on-notice/

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US COUNTER-WMD

Defense News (Washington, D.C.)

After Complex Test, Is the US Army's Major Missile Defense Command System Ready for Prime Time?

By Jen Judson

Dec. 12, 2019

WASHINGTON — The U.S. Army's major missile defense command system, which has been in development for years and experienced lengthy delays, successfully completed a complex test Dec. 12 against two cruise missiles, marking the last hurdle to get the system ready for its operational test next year.

The service planned to up the ante in the December test as a last effort to prove the capability of the Integrated Air and Missile Defense Battle Command System, or IBCS, ahead of a limited-user test in the third quarter of fiscal 2020, Brig. Gen. Brian Gibson, who leads the Army's air and missile defense modernization effort, told Defense News in October.

The IBCS has journeyed a rocky road to a delayed fielding, partly after failing its first limited-user test in 2016.

Software problems discovered during that first test resulted in schedule delays of nearly four years. The Army originally planned to reach initial operational capability in FY19, but those plans slipped to the third quarter of FY22, according to FY18 budget documents.

But the system, which is meant to tie together all missile defense sensors and shooters on the battlefield through a command-and-control center, has seen recent success in its testing program.

According to the manufacturer of IBCS, Northrop Grumman, the system was able to simultaneously track and engage two incoming target cruise missiles during a flight test at White Sands Missile Range, New Mexico.

Adding to complexity the threat-representative cruise missiles flew in a maneuvering formation until nearing targets and then "split off to attack two separate defended assets," the company said in a statement.

The IBCS system was tied to the Sentinel radar, the Patriot air defense system and a Marine TPS-59 radar connected through an external Link 16 network, demonstrating the system's ability to tie into joint systems and Army-specific systems.

An F-35 fighter jet with sensors adapted for IBCS also contributed to the test.

Patriot Advanced Capability-2 Guidance Enhanced Missile-TBM interceptors were used to take out the targets in the test.

Northrop said the test "demonstrated successful interoperability and the end-to-end performance of the IBCS system to detect, track and simultaneously engage multiple threats."

The test "further demonstrates the maturity of the Integrated Battle Command System and its capabilities in support of Multi-Domain Operations," Maj. Gen. Rob Rasch, the Army's program executive officer for missiles and space, said in the Northrop statement. "The inclusion of Marine Corps and Air Force sensor systems in the test architecture validate the system's open architecture and the potential for IBCS to operate seamlessly with joint services, as well as foreign partners in the future, to extend battlespace and defeat complex threats."

Gibson told Defense News shortly after the test that it marked the involvement of the highest number of soldier operators in an IBCS developmental test to date. The Army has worked to keep the same unit involved — a test detachment from the 30th Brigade, 3rd Battalion, 6th Air Defense Artillery Regiment — in recent tests to build confidence and entrenched knowledge in the system.

The test also proved the system isn't just useful to the Army, but could be a joint system, as it worked to tie in a Marine Corps ground radar as well as aerial sensors on an Air Force fighter jet, Gibson explained.

The Army is still on the same path toward a limited-user test, Gibson added, and he expects it to begin in late spring or early summer. Afterward, the Army will make a decision on the way forward for IBCS in the late summer or early fall.

Gibson said he feels more prepared for the limited-user test as the result of the recent developmental tests of the IBCS system, adding that the test results put to rest the technical risk that previously existed.

While the initial fielding will involve tying together the Army's primary air defense sensors — Sentinel and Patriot — it's just a launching pad for broader fires integration across the Army and potentially the joint force, Gibson said.

https://www.defensenews.com/land/2019/12/12/after-complex-test-is-the-armys-major-missile-defense-command-system-ready-for-primetime/

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US ARMS CONTROL

The Hill (Washington, D.C.)

Air Force General: North Korea 'Christmas Gift' Could Be Long-Range Missile Test

By Rebecca Kheel

Dec. 17, 2019

A top U.S. Air Force general on Tuesday said he expects North Korea's "Christmas gift" to the United States to be a long-range missile test.

"What I would expect is some type of long-range ballistic missile would be the gift. It's just a matter of does it come on Christmas Eve, does it come on Christmas Day, does it come after the New Year," Gen. Charles Brown, commander of Pacific Air Forces and air component commander for U.S. Indo-Pacific Command, said at a breakfast roundtable in response to a question from The Hill.

Pressed later in the roundtable on what North Korea could do, Brown said there is a "range" of possibilities.

"I think there's a range of things that could occur," he told reporters. "I think there's also the possibility that the self-imposed moratorium [on long-range tests] may go away and nothing happens right away. [North Korean leader Kim Jong Un] announces it but then doesn't shoot."

As diplomatic efforts at a denuclearization deal with North Korea flounder, Pyongyang recently threatened to deliver an unwelcome "Christmas gift" to the United States. North Korea has also set a year-end deadline for the U.S. to soften its negotiating stance or it will take a "new path."

Pyongyang has not specified what the new path or Christmas gift will be, but regional experts expect it could include a return to intercontinental ballistic missile (ICBM) or nuclear tests.

North Korea has launched dozens of short-range missiles since May but has adhered to a self-imposed moratorium on ICBM and nuclear tests since talks with the United States began last year.

On Monday, President Trump said he would be "disappointed" if that happens.

"I would be disappointed if something would be in the works, and if it is, we will take care of it," Trump told reporters.

"We're watching it very closely," Trump continued.

On Tuesday, Brown would not discuss intelligence on whether North Korea is preparing a long-range missile test but pointed to Pyongyang's recent rhetoric and other recent tests.

"There is a pattern that you see with the North Koreans, [which] is the rhetoric precedes activity, which precedes a launch," he said.

On Friday, North Korea performed what it described as a "crucial test" at its long-range rocket launch site, without specifying what was tested. That came days after it said it conducted a "very important test" at the same site.

In a bid to get North Korea back to the negotiating table in November, the U.S. military postponed a joint air exercise with South Korea that Pyongyang had been complaining about, the latest in a series of exercises canceled to make space for diplomacy.

Brown said Tuesday the decision to resume exercises amid renewed tension rests with leaders above him. He maintained that he is "not worried" about readiness at "the tactical level," despite the canceled exercises.

But with the Christmas gift looming, Brown said he is "dust[ing] off" responses the military had at the height of North Korea tensions in 2017 in making recommendations for how to respond to any new provocation.

"Our job is to backstop the diplomatic efforts," he said. "And if the diplomatic efforts kind of fall apart, we got to be ready, and I can't be studying the problem. And that's the thing, we're already thinking ahead. Go back to 2017, there's a lot of stuff we did in 2017 that we can dust off pretty quickly and be ready to use. ... We are looking at all of the things we have done in the past."

https://thehill.com/policy/defense/474884-air-force-general-north-koreas-christmas-gift-could-be-long-range-missile-test

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Homeland Preparedness News (Washington, D.C.)

Sen. Markey, Rep. Sherman Introduce Bill to Strengthen WMD Treaties

By Dave Koveleski

Dec. 13, 2019

Sen. Edward Markey (D-MA) and Rep. Brad Sherman (D-CA) introduced legislation Wednesday that would require the U.S. president to certify whether a foreign country is violating a weapons of mass destruction treaty.

The Preventing the Spread of Nuclear Weapons Act says that if these conditions are met, any new or renewed U.S. agreement, such as with Turkey, will be subject to a joint resolution of approval by Congress.

The United States agreement with Turkey, signed in 2008, is due to be automatically renewed in 2023 without Congress being able to weigh in. The bill's authors are concerned that Turkey may fail to honor its obligation under the Nuclear Non-Proliferation Treaty (NPT) to not acquire a nuclear weapon.

"President Erdogan's flaunting of international norms – from Turkey's invasion of Northern Syria, crackdown on human rights within Turkey, and his open desire to acquire a nuclear weapon – make it vital that Congress have the chance to vote to approve a new or extended 123 agreement with Turkey," Markey, ranking member of the East Asia Subcommittee of the Senate Foreign Relations Committee, said. "Turkey is signed onto the NPT Treaty as a non-nuclear weapon state, and Congress must make it clear that it will not tolerate an arms race in the volatile Middle East."

Sherman says the United States should not give a blank check to countries seeking nuclear weapons.

"The United States should not be in the business of selling nuclear technology to leaders who have openly expressed an interest in seeking nuclear weapons. This is true whether the leaders are from Iran, Saudi Arabia, or Recep Tayyip Erdogan in Turkey," Sherman said.

https://homelandprepnews.com/stories/41226-sen-markey-rep-sherman-introduce-bill-to-strengthen-wmd-treaties/

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Bulletin of the Atomic Scientists (Chicago, Illinois)

Santa Kim Is Coming to Town — with North Korean Gifts That Keep on Giving

By Ankit Panda

Dec. 13, 2019

For a Marxist-Leninist monarchy with nothing close to a free press to speak of, North Korea is remarkably savvy at goading Western editors into crafting catchy headlines that ensure that the regime's messaging makes it all the way from the Korean Central News Agency's wires to page one of top American dailies. Its greatest hits include dusting off the obscure epithet "dotard" to describe President Trump in September 2017 and threatening to bracket Guam with four Hwasong-12 intermediate-range ballistic missiles in August 2017. More recently, a statement attributed to Ri Thae Song, a vice minister of foreign affairs in North Korea, said that it was "entirely up to the US what Christmas gift it will select to get" as December 2019 got underway.

You don't have to be wrapped up in the holiday spirit to see why that's evocative. In the days since, analysts and pundits have been debating what "Christmas gift" is likely. The December 7 test at the Sohae Satellite Launching Center is not it; it's, as Jeffrey Lewis put it, a "lump of coal in [Trump's] stocking," but something big is likely coming. The "Christmas gift" message hearkens back to North Korea's July 2017 inaugural launch of an intercontinental-range ballistic missile (ICBM), after which Kim directed his missile scientists to "frequently send big and small 'gift packages' to the Yankees."

Kim's missile scientists were largely muzzled between November 2017 and May 2019; as in the past, North Korea held off from missile launches while talks with the United States were on. Since May 4, however, when the testing campaign re-started, North Korea has launched 25 or 26 missiles—mostly short-range, with the exception of one submarine-launched ballistic missile. All of the missiles tested this year have employed solid propellants, meaning that they are more flexible and responsive. (Solid propellant missiles are fueled as they are manufactured, unlike liquid propellant missiles, which must be filled with fuel and oxidizer just prior to launch). In a crisis, solid propellant missiles are more likely to survive attempts at preemption because they're more mobile and easier to operate. Beyond using solid propellant, at least one of Kim's newly tested missiles this year has exhibited quasi-ballistic flight trajectories, which could present a challenge to existing missile defense interceptors deployed on the Korean Peninsula.

Naughty or nice? If there is a "Christmas gift" that awaits the United States, it is unlikely to be something as pedestrian as a short-range ballistic missile. Instead, Kim is likely gearing up for one of three possibilities: a second launch of the Hwasong-15 ICBM (the same one launched once in November 2017); the inaugural flight-test of a solid propellant ICBM or intermediate-range ballistic missile; or the inaugural launch of a new-generation of space launch vehicle.

The "very important" test that was carried out on December 7 at the Sohae Satellite Launching Ground's static liquid propellant engine test stand would suggest that Kim's scientists have just tested a large liquid propellant engine; that is a reliable short- to medium-term indicator of new launch activity. In March 2017, at Sohae, Kim oversaw the first-ever test of the RD-250-variant engine that would weeks later see (unsuccessful) testing under the Hwasong-12 intermediate-range ballistic missile. In late-June 2017, Kim similarly oversaw the testing of the upper-stage engine of the Hwasong-14, which was launched just weeks later.

There is reason to expect that whatever North Korea does will include something qualitatively new. For instance, if Kim does order a second test of the Hwasong-15 ICBM, we may expect to see a new type of indigenously built heavy launch vehicle. That would be a notable development, as it would indicate that North Korea had managed to successfully wean itself off its reliance on the six-odd heavy logging trucks that it had imported under false pretext from China and converted for use as

transporter-erector-launchers. Separately, Kim may choose to use a new launch to overfly Japan into the northern Pacific with an ICBM—something North Korea has never done before. A recent statement hinting that Japanese Prime Minister Shinzo Abe should expect to see a ballistic missile suggests that whatever may be coming is likely to either splash down in the waters around Japan or overfly the country. Kim may also choose to demonstrate a multiple reentry vehicle capability off the Hwasong-15.

Perhaps the most interesting option for North Korea, however, would be a space launch. Unlike missile tests, which are revealed to the world only when they happen, North Korea insists that its space activities are entirely civilian in nature and peaceful. In the past, this has meant that it goes to pains to behave like a "normal" country, issuing warnings to respectable international organizations like the International Maritime Organization indicating hazard zones for spent rocket stages falling back to earth. There hasn't been a satellite launch in North Korea since February 2016 and, in late-2017 and early-2018, there were strong signs that Pyongyang was hard at work at a successor generation of space launch vehicles to the Unha-3, which launched the Kwangmyongsong-4 satellite in 2016. North Korean space program officials have indicated interest in geosynchronous orbit payloads and earth-observation satellites. None of North Korea's previous orbital payloads are known to have performed useful remote sensing work; that may be about to change.

In the present political context, the advantage of a space launch would be for North Korea to engineer a crisis with the Trump administration. The administration—at least with Iran—has made clear that, from their view, space launch vehicles and ICBMs are birds of a feather (even though, in practice, this relationship is overstated and largely misunderstood). Could Trump overlook an announced space launch by North Korea—or would he seek to rush to the negotiating table to prevent that from happening as he approaches an election? Pyongyang may be betting on the latter, hoping to pull off a "reverse Leap Day Deal," where a space launch announcement salvages diplomacy with the United States rather than scuttling it.

But that's just the "Christmas gift." Exhausting the possible range of other "gifts" that might lie ahead into 2020 is less simple. After the December 7 test, Kim Yong Chol, formerly Secretary of State Mike Pompeo's negotiating counterpart, released a statement in which he underscored that North Korea's objective was to "surprise" President Trump. That's not a particularly comforting assertion, as North Korea potentially has plenty of surprises up its sleeve. Two of its threats from 2017—to bracket the waters around Guam with ballistic missiles and to conduct an atmospheric nuclear test—were never formally taken off the table. Recently, too, North Korea demonstrated that it has a new ballistic missile submarine under construction.

Over the course of 2020, North Korea could also look to conduct a test of its new Pukguksong-3 submarine-launched ballistic missile off of either that submarine or its older Gorae-class submarine. Separately, analysts have noticed intriguing activity at the ever-mysterious experimental light water reactor at the Yongbyon nuclear complex. Could a formal start-up of that reactor lie ahead? During his 2019 New Year's Day address, Kim did spend considerable time discussing domestic sources of electricity, including "atomic power." Any or all of these "surprises" may lie ahead. In his statement, Kim Yong Chol indicated that North Korea was returning to its old risk-acceptant ways, underscoring that Pyongyang had "nothing to lose."

In short, Kim has a long list of options to choose from—and he's probably checking it twice before he makes his mind up. In fact, an official statement from Pyongyang released Thursday notes that the United States' decision to call a new session of the United Nations Security Council to discuss North Korean missile launches "helped us make a definite decision on what way to choose," suggesting that Kim had been keeping his options open.

Kim and the US election. President Trump's recent reaction to North Korea's test at Sohae contained a curious assertion: Kim "does not want to void his special relationship with the President of the United States or interfere with the US Presidential Election in November." Trump has famously been unwilling to acknowledge the well-substantiated Russian state-backed effort to interfere in the 2016 election, so it is curious that North Korea—a country that has not publicly, credibly been accused of election interference—came under his microscope. Could the president have an unpublicized deal with Kim to hold off on missile and nuclear testing through the 2020 US elections? Publicly available evidence would suggest no, but complete accounts of the president's discussions with Kim Jong Un are not readily available.

The president, after Singapore, made a habit of emphasizing that his diplomacy had gotten North Korea to stop launching ballistic missiles and conducting nuclear tests. In April 2018, Kim Jong Un, at the fourth plenum of the 7th Central Committee of the Workers' Party of Korea, announced a unilateral moratorium on ICBM and nuclear tests—with the reasoning that North Korea's development efforts through 2017 were so robust that no further testing was required. Trump still used the moratorium to great effect, convincing many of his supporters that his bold and personal diplomacy with Kim had gotten results that no American leaders had gotten in the past. (Kim's father agreed to a long-range missile testing moratorium in 1999 that lasted through July 2006.)

Kim Jong Un, however, does have leverage to engineer a crisis at an inopportune time. With an election less than eleven months away, Trump has reason to stay Kim's hand from signing any ICBM test orders, lest the fiction of the "Singapore process" erode completely in the eyes of the American public. But, as 2017 showed, North Korea's search for leverage in the form of qualitatively advancing its nuclear forces can push decision-makers in Washington toward dangerous ends. Where Trump's instincts during the diplomatic process with Kim were to express his feelings through heartfelt letters, hand-written and delivered to Kim's desk, the president may find himself once again drawn to expressing himself through "fire and fury," sparking a new crisis.

https://thebulletin.org/2019/12/santa-kim-is-coming-to-town-with-north-korean-gifts-that-keep-on-giving/#

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COMMENTARY

Defense One (Washington, D.C.)

Add Economic Policy to Deterrence Planning

By Elizabeth Rosenberg and Jordan Tama

Dec. 16, 2019

American defense leaders have adapted over the years to shifts in technology and conflict — for example, accepting space and cyber as principal warfighting domains and integrating them into planning and thinking about deterrence and escalation. But national security policymakers are overdue to incorporate economic instruments, such as sanctions and trade controls, into planning for conflicts and crises.

From Russia and North Korea to Iran and Venezuela, U.S. presidents and lawmakers have long employed varying levels of economic pressure to alter the policies of foreign governments. Some of these tools – for instance, severing links between a country and the international financial system – can impose greater costs than some uses of military force. Yet policymakers have given too little

thought to how different types of economic pressure intersect with different forms of military coercion.

One way to do better would be to develop a whole-of-government framework for conflict escalation, as we recommend in a new Center for a New American Security report. The National Security Council should coordinate an interagency effort to formalize this framework, working with independent experts and international allies, and then adopt it in the planning process. Equally important, U.S. government officials should publicly discuss the finalized framework so that partners and competitors do not misunderstand what it means when the United States uses powerful economic tools.

This idea constitutes a rethinking of the "escalation ladder" developed by Herman Kahn in the 1960s to conceptualize different stages of conflict. Of the 44 rungs on Kahn's ladder, only two include economic measures: the second rung refers vaguely to "political, economic and diplomatic gestures," while the twentieth rung refers to the much more sweeping step of a "worldwide embargo or blockade." Almost all of the other rungs concern the threat or use of military force.

Some defense thinkers have suggested updates to Kahn's ladder to incorporate the cyber and space domains. Yet no one has made a similar effort to bring economic coercion into play.

One cause (and effect) is that national security analysts and experts are woefully unequipped to understand and shape how economic tools—that are often a first resort of U.S. policymakers—should be used against adversaries and competitors. This is especially urgent as great power competition between the United States and China takes on a heavily economic character, as Defense Secretary Mark Esper has noted.

Developing and publicizing an escalation ladder that incorporates both military and economic forms of coercion would improve deterrence and reduce the chances of unintentional conflict escalation.

Clearly laying out the costs the United States will impose in a given scenario allows an adversary or competitor to more clearly understand their incentive to refrain from provocative actions. This increases the chance that U.S. officials can induce the desired behavior with a threat rather than the actual use of sanctions, military force, or other coercive instruments. Also, this may help avoid the scenario where the targets of sanctions are backed up against a wall and find it politically difficult to make concessions to the United States, a situation in which they are more likely to retaliate and escalate. This problem is particularly acute amid surging anti-Americanism and nationalism, which can lead governments to spurn, rather than accommodate or engage, the United States.

An updated escalation ladder would also clarify what U.S. policymakers mean with each particular step, reducing the risk that an adversary would perceive an action as more, or less, damaging than intended. This would both increase the potency of threats and reduce the risk of accidental escalation.

Finally, this new framework would facilitate efforts to de-escalate conflicts by climbing down the ladder – for instance, by lifting trade controls or withdrawing military forces. Although national security planners tend not to give de-escalation as much attention as escalation, it is a critical part of preventing conflict and moving from conflict to cooperation.

What might a new whole-of-government escalation framework look like? In brief, it would rank coercive actions based on their anticipated effects – from threats alone to actions causing catastrophic consequences. Developing this ranking would itself be a major endeavor, as it would require the U.S. government interagency process to undertake sophisticated analyses that weigh the severity of various military and non-military actions based on the full range of their typical or expected effects. Given variation in the effects of different coercive actions in different scenarios, a

fully developed escalation framework would be best represented not by a ladder but by a model that allows for greater complexity in more dimensions, such as a lattice or grid. But using the ladder analogy to illustrate the concept is a good, and intuitive, place to start.

In a simple rendering, a whole-of-government escalation ladder that incorporates both military and non-military actions could have seven steps:

7. Catastrophic actions: Kinetic attack with high-yield nuclear weapons.

6. Devastating actions: Large-scale kinetic attack with conventional weapons, comprehensive trade embargo and blockade, cyber-attacks that incapacitate entire critical infrastructure sectors.

5. Highly damaging actions: Sustained air strikes on military targets, sanctions that restrict financial flows between target and other countries, destruction of satellites used for societal or military functions

4. Damaging actions: Provision of arms to groups rebelling against government, trade measures that restrict export or import of sophisticated technology, jamming of satellites used for societal or military functions.

3. Harassing actions: Show of military power short of using force, targeted sanctions on government officials or institutions, trade restrictions that disrupt supply chains involving sophisticated technology, cyber attacks that disrupt a government network.

2. Public threats: Public threats to impose military, economic, cyber or other costs.

1. Private threats: Private threats to impose military, economic, cyber or other costs.

The incorporation of tools of economic coercion into a conflict escalation framework need not entail the further militarization of U.S. foreign policy or weaponization of economic interdependence. The broad field of economics need not be considered a new warfighting domain, and economic policymaking should certainly not be transferred from civilian agencies to the Defense Department. Instead, the notion of considering economic measures alongside other policy measures that are seen as accepted areas of security contestation and conflict is designed to help the U.S. government catch up with the character of contemporary global affairs. Fundamentally, international competition no longer recognizes a clear divide between military and non-military instruments of foreign policy.

For the sake of effective foreign policy and defense planning, U.S. security leaders should pursue a transparent effort to bring thinking about deterrence and escalation in line with realities about the uses of economic coercion in conflict. Expanding, maturing, and formalizing the way that U.S. leaders view, and communicate about, economic coercion in situations of conflict may have an even more important outcome in minimizing a march into aggression. It will help policymakers be clearer in their messaging, protect security and international norms more effectively, and reduce the risk of our future conflicts spiraling out of control.

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The Hill (Washington, D.C.)

Return of Nuclear Doomsday

By William Courtney

Dec. 11, 2019

Elder statesmen are again warning of nuclear dangers. But have they risen? Maybe, but they remain only faint echoes of Cold War era risks.

Last month, former Soviet President Mikhail Gorbachev said the world was in "colossal danger" from nuclear weapons. He is to be taken seriously. Gorbachev and President Ronald Reagan concluded the first treaty ever to reduce and eliminate a whole class of nuclear arms, the Intermediate-range Nuclear Forces Treaty, a historic accomplishment. Last August the U.S., with NATO support, withdrew from the treaty after years of Russian noncompliance.

In the U.S., former Secretaries of State and Defense George Shultz and William Perry, respectively, and former Senate Armed Services Committee Chairman Sam Nunn, have sounded tocsins about nuclear dangers. Last April they said the U.S. and its allies and Russia were trapped in "policy paralysis" that could potentially lead to the "use of nuclear weapons for the first time in nearly 74 years."

One can understand and should pay attention to their concern. One reason is that occasional bellicose rhetoric heightens fears.

In January 2018 North Korean leader Kim Jong-un boasted of a nuclear launch button "always on my table." President Donald Trump responded that his nuclear button was "much bigger" and "more powerful." On December 3 Trump again called Kim "rocket man," and said "if we have to," the U.S. would use force against North Korea.

In March 2018 in an annual state-of-the-nation speech, President Vladimir Putin bragged that Russia had developed "invincible" nuclear delivery systems. He showed a graphic video of missiles raining down on Florida. Last October the Russian press highlighted Putin's personal direction of a strategic nuclear forces exercise.

Last June Trump said he did not want war with Iran, but implied a willingness to employ nuclear forces by saying the country could face "obliteration" if a conflict broke out.

It is true that in recent years Russia's relations with the West have sharply deteriorated. Causes include Russia's aggression in Ukraine, interference in Western elections and support for the brutal Assad regime in Syria, and U.S. sanctions on "malign" Russian activities.

Yet in Syria and elsewhere, Russian and Western militaries carefully cooperate to deconflict their operations. This reduces the risk of accidental or inadvertent events that could escalate.

This responsible behavior contrasts against bluster and risk-taking in a number of Cold War crises which, if they had been further mishandled, could possibly have led to nuclear exchanges. Several examples are illustrative.

In 1948 the Soviets blockaded all road, rail and water routes to the Allied-controlled sectors of Berlin, then surrounded by communist-controlled East Germany. The West mounted the largest airlift in history of humanitarian goods, and the U.S. sent atomic-capable B-29 bombers to Britain. The blockade ended 11 months after it began.

In 1950 forces from communist North Korea, with Soviet military support, invaded South Korea. President Harry Truman deployed atomic-capable B-29s in Great Britain and the Pacific.

In 1962 the USSR secretly shipped nuclear-armed missiles to Cuba by sea. After President John Kennedy imposed a naval quarantine and secretly promised to withdraw U.S. nuclear-armed missiles from Turkey, Soviet Premier Nikita Khrushchev withdrew his nuclear forces.

In 1973, for the only time ever, the U.S. elevated its defense alert status to DEFCON 3 in response to intelligence indicating that the USSR may have been shipping nuclear weapons to Egypt at the height of the Yom Kippur War. Soviet ships dispersed and DEFCON 3 ended a day after it was imposed.

In 1983 NATO carried out a command post exercise, called Able Archer, which simulated a nuclear conflict. Coming soon after Reagan called the Soviet Union an "evil empire," Soviet security organs panicked, fearing an actual U.S. nuclear strike.

In 1985 Gorbachev came to power in the Kremlin and relaxed tensions with the West. In 1991 they eased further after the Soviet Union collapsed. For the last 36 years – since Able Archer – there have been no crises comparable to those of the Cold War era that might have raised risks of nuclear fighting.

It is time for everyone to take a deep breath. Risks remain regarding the theft, smuggling or proliferation of nuclear materials, technology and potentially even weapons. But the risk of a nuclear conflict between Russia and the West is vanishingly low, creating an opportunity to deliberately and carefully take steps to avoid future risks.

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

Understanding Iran's Nuclear Escalation Strategy

By Eric Brewer and Ariane Tabatabai

Dec. 12, 2019

Iran is back in the nuclear game.

In May 2019, Iran's President Hassan Rouhani announced that his country would no longer be bound by the nuclear limits under the Joint Comprehensive Plan of Action (JCPOA), better known simply as the Iran nuclear deal. Rouhani's remarks marked the end of a year-long period in which Iran continued implementing the agreement after Washington withdrew from it in May 2018. Throughout the rest of 2019, Iran gradually reduced its compliance with the deal. Meanwhile, the U.S. "maximum pressure" campaign starved Iran's economy, helping fuel nationwide protests in November, which left hundreds dead following a crackdown by security forces.

While ramping up its nuclear activities in contravention of the nuclear deal may seem like an attempt to get a bomb, we don't think that's the case. The fact that it is gradually and so publicly violating the deal suggests Iran is, instead, trying to put pressure on the international community to

relieve sanctions. Nevertheless, its actions beg the question — what are Iran's goals? Why has it adopted this strategy? And perhaps most importantly — how far does it intend to go?

Iran is expected to continue to push the nuclear envelope in 2020. If it sticks to its stated schedule of taking a step to reduce its compliance with the JCPOA every two months, Iran will have six more opportunities before the November elections in the United States to increase its nuclear activities. For now, it's unclear exactly what these steps will entail as the Iranian government has kept these measures close to the chest. But Tehran has already crossed key lines in the agreement, suggesting that if it wants to keep up pressure on the United States and Europe, it might need to go even further in 2020.

The timing is important. America's response to provocative moves by Iran will have political implications for the 2020 presidential elections. These nuclear steps may accompany and complement continued military action in the Middle East in what's become a two-pronged approach by Tehran aimed at raising the cost of President Donald Trump's maximum pressure campaign and building leverage vis-à-vis America. These activities have included targeting oil production facilities and shipping in the Persian Gulf and Strait of Hormuz, and increased aggression by Iranian-backed militias in Iraq and in the Arabian peninsula. As we await the first of several potential new steps, it's important to take stock of what Tehran has done so far to resume nuclear activities restricted or halted by the JCPOA, why it has done so, and to think through what 2020 may bring along.

Iran's Decision-Making and Calculations

After Trump withdrew the United States from the JCPOA in May 2018 and proceeded to implement his administration's "maximum pressure campaign," Tehran undertook what it dubbed its "strategic patience" policy. The strategy entailed a continued adherence to the deal by Iran in the hopes that Europe would take steps to undermine America's new hardline Iran policy. However, a year after the U.S. withdrawal from the agreement, it became clear that Europe, while clearly disenchanted by the U.S. approach, was nonetheless unable to effectively counter it. This led Iran to reconsider its own course of action, shifting from a "wait and see" approach to a much more assertive one.

In announcing its new policy, Rouhani noted that Iran would begin disengaging from its nuclear commitments under the deal for as long as the other parties to the agreement fail to provide it with what it desires: Access to the global financial system and the ability to export its oil. In short, after each new step, Tehran would grant the Europeans two months to come through. If Europe responds in a satisfactory manner, Iran would then reverse course and return to fully implementing the deal. If not, then the country would push through and continue to dial down its own compliance with the agreement in 60-day increments.

So far, Iran's approach hasn't succeeded. Indeed, it has brought further pressure on Tehran. The United States has imposed additional sanctions and the Europeans reportedly threatened to trigger the dispute-resolution mechanism if Iran's nuclear escalation continues. But the strategy has allowed Iran to resume certain nuclear activities previously constrained under the JCPOA, while also signaling to Europe and the United States that pressure won't be met with patience forever. Instead, Iran, too, has sticks and carrots at its disposal and seems willing to deploy them.

Iran has complemented its gradual nuclear escalation with more aggressive military measures in the region. In doing so, Iran is deliberately dragging U.S. European allies into the ongoing tensions, demonstrating to them that they can't be passive observers to the new U.S. hard line policy on Iran; they are involved, like it or not. In particular, Iran has targeted European (and Japanese and Gulf

Arab) oil tankers, and regional oil production. The message from Iran is simple: If Iran can't sell its oil and gain access to their revenue, neither will America's regional partners and European allies.

This course of action has proved popular within the Iranian system and provided Rouhani with a much-needed boost. It's signaling that Tehran's strategic patience for the JCPOA is finally running out.

Iran's decision-making process on sensitive issues such as its nuclear program can be opaque and hard to dissect. But it's clear that every step Iran has taken so far, from the initial period of "strategic patience" to the more aggressive posture of slowly rolling back its JCPOA commitments over the past six months, has been taken at the highest levels of the regime and with input from key power centers.

Immediately after Trump's remarks starting the process of the U.S. withdrawal from the JCPOA and the subsequent re-imposition of sanctions (along with the implementation of the "maximum pressure" campaign), Iran's Supreme Leader Ayatollah Ali Khamenei made important remarks about Iran's next steps. He noted that his country would continue to implement the deal, but that it would also begin to prepare the groundwork for a possible collapse of the agreement. Later, Iran would come to characterize this phase as "strategic patience." The Atomic Energy Organization of Iran, the entity in charge of running Iran's nuclear program, was key to this phase. Per its mandate, the organization is responsible for meeting nuclear policy objectives and preparing for what's next.

Khamenei's framework set the basic parameters for the Supreme National Security Council to design the nuclear policy moving forward. The Supreme National Security Council is tasked with streamlining national security decision-making by bringing together all key power centers within the regime. The organization includes representatives from otherwise siloed organizations, including the supreme leader's office, the executive branch, and the armed forces (chiefly, in the context of the nuclear file, the Islamic Revolutionary Guards Corps). The Supreme National Security Council has coordinated with the Atomic Energy Organization of Iran to design and implement the steps taken since May 2019.

All in all, Iran is showing a great deal of discipline. Rather than burning the JCPOA, as Khamenei had vowed to do prior to the U.S. withdrawal, Iran is taking calculated and deliberate steps. The process is noteworthy and stands in stark contrast to the Washington's approach, which lacks a coherent strategy. Since the abandonment of the nuclear deal, there is no obvious U.S. plan to mitigate the risks of containing Iran's nuclear program. And that has translated into lost leverage, making it even more difficult to achieve already lofty American foreign policy goals.

Unwinding the JCPOA, 60 Days at a Time

In May — one year after the U.S. withdrawal from the nuclear deal — Iran abandoned its "strategic patience" approach and began a process of incrementally rolling back its JCPOA commitments every 60 days. As of this month, Iran had breached the caps on its heavy water and low enriched uranium stockpiles, enriched to higher levels than allowed under the deal, abandoned restrictions on its centrifuge research and development activities, and, most recently, resumed enrichment at the underground Fordow facility, which it had committed to repurpose for non-enrichment activities. Iran's approach to rolling back its nuclear commitments has been bold yet calibrated — designed to gradually build pressure on the United States and Europe by targeting key pillars of the agreement, rather than racing for a short-notice breakout capability.

Most of Iran's moves have been intentionally headline-grabbing. Its decisions to grow its stockpile of enriched uranium, to increase its level of enrichment, and to resume enrichment at Fordow are provocative because they violate key parts of the agreement that are designed to keep Iran at a one-year breakout timeline. Iran's resumption of enrichment at Fordow — which is more deeply buried

than Iran's other enrichment site at Natanz — is also problematic because the facility is harder to eliminate with a military strike.

At the same time, however, Iran's accumulation of fissile material has been gradual, its increase in enrichment level marginal (it has increased from the JCPOA-mandated 3.67 percent to just under 5 percent — well short of the roughly 90 percent needed for a bomb), and it is only using some of its centrifuges to enrich at Fordow (the facility remains below its pre-JCPOA capacity). Thus, while these measures will slowly eat away at the breakdown timeline, Iran is nowhere near the two- to three-month timeline to a bomb's worth of nuclear material that it was at prior to the deal.

The one outlier in Iran's pattern is the expansion of its centrifuge research and development efforts. Iran announced in September that it would be adding cascades of more advanced IR-2m and IR-4 centrifuges — previously removed by the JCPOA — and that it would begin enriching IR-4s and IR-6s in greater numbers than the deal permits. It also unveiled what it claimed were brand new IR-8 and IR-9 centrifuges in November. Although less flashy than resuming enrichment at a deeply buried bunker, increasing its research — especially over an extended period — perhaps has the greatest technical impact because it allows Iran to gain knowledge about how its advanced centrifuges work, possibly improving them in the process. This could shorten the time window in which Iran could deploy these advanced centrifuges on a larger scale. Iran has highlighted the fact that all of its measures could be easily reversed. Still, while it can shut down and remove advanced centrifuges to JCPOA levels, it cannot erase the knowledge it has gained.

Iran's coercive approach has largely been consistent since May. Tehran has tried to make the timing of its moves predictable: It has made clear that every 60 days it will further reduce its commitments, giving Europe and others a window to try and forestall further strain to the deal. Tehran's demands have also been clear: The benefits of the deal that it lost when the United States withdrew and re-imposed sanctions need to be restored, either by Europe finding workarounds or by America re-entering the deal. Additionally, Iran has emphasized that the International Atomic Energy Agency (IAEA) is fully aware of and monitoring its new activities. This is seemingly designed to help retain confidence that it is not doing more than it threatens, or that it is trying to build a bomb. Tehran probably believes that doing otherwise would provide the United States and Israel with the ammunition to build international support that could further isolate Tehran.

Some aspects of Iran's approach, however, have changed since May — likely due to a sense that its strategy hasn't yet succeeded coupled with internal debates within Tehran over how aggressive Iran should be in ratcheting up its program. For one, it has given fewer advance signals about exactly which commitments it will roll back, or when. For example, Iran announced in May it would breach its caps on enrichment but did not actually follow through until July. Iran delayed the first step by 60 days to provide the Europeans with enough time to react to its announcement. In contrast, the Iranian government did not provide any serious public warnings about resuming enrichment at Fordow before announcing that it was doing so. In fact, just days before Rouhani's remarks on Fordow, Iran had announced new research and development measures, which many (both inside and outside Iran) had assumed would constitute its fourth step.

As it stands, Iran has avoided limiting the IAEA's access to its nuclear program, recognizing that blinding the international community to its activities could raise alarms that it is building a bomb. The detainment of an IAEA inspector last month raises the question of whether Iran might go down this path. It also raises the question of whether Iran — in addition to its clear, well-publicized actions to eliminate its commitments at certain intervals — might pursue a more subtle campaign of harassment of inspectors.

Greater unpredictability about what actions Iran might take and steps to impede IAEA access would be more provocative, and increases the chances of miscalculation.

Where Do We Go from Here?

It's unclear how far Iranian leaders are willing to go on the nuclear issue. There are reasons for analysts to be humble: Few would have guessed that in September Iran would dare carry out a reported cruise missile strike directly into Saudi territory, just as most analysts hadn't foreseen the escalatory actions taken by Iran in the Persian Gulf in spring and summer 2019.

Some may think that the specter of EU sanctions or a UN sanctions snapback might cause Iran to cease its escalatory behavior. But this confidence is probably misplaced. While Iran might not be actively seeking to collapse the deal and trigger sanctions, it is certainly more than willing to run that risk, as evidenced by its continued violations of the deal.

And Iran has warned that if sanctions are re-imposed it will not sit idly by. Deputy Foreign Minister Abbas Araqchi recently stated at a Moscow conference that if Iran's reward for years of negotiations and cooperation are to have UN sanctions re-imposed, then it will be forced to move from tactical steps to a broader strategic re-examination of its nuclear doctrine.

If Iran maintains its 60-day clock, it will have six more opportunities to reduce its commitments between now and the 2020 U.S. presidential election. What might it be willing to do? While there is a wide range of possible actions, there are four broad categories of activities worth worrying about.

Actions that shorten Iran's breakout timeline. Iran has threatened multiple times that it could resume enrichment to 20 percent — a significant step that would more quickly shorten its breakout timeline. If the United States ends sanctions waivers that allow for Iran to import 20 percent enriched fuel as some have advocated, this could give Iran a degree of political cover for resuming enrichment to this level (cover it has used in the past). Iran could also increase centrifuge production, add additional centrifuges at Natanz, deploy advanced centrifuges in greater numbers, or expand enrichment efforts at Fordow.

Actions that reduce the international community's insights into Iran's nuclear program. Iran could also choose to reduce the IAEA's access. Ending its provisional application of the Additional Protocol would be a provocative step, and would curtail the IAEA's ability to detect undeclared activities. But Iran has other, more targeted mechanisms at its disposal. These include curbing the IAEA's ability to monitor Iran's centrifuge production and manufacturing equipment, or preventing inspectors from accessing yellowcake production activities. These and other measures could make it harder for the IAEA to detect diversion of this equipment or material for covert efforts — which is ultimately more worrying than the unlikely Iranian "breakout" using its declared facilities — and could make it more difficult to establish a new baseline of such activities if the JCPOA were saved or a new deal reached.

Actions that bear on other pathways to a nuclear weapon. Iran could make announcements that bear on other routes to a bomb or steps in nuclear weapons production — though it would likely not acknowledge this fact. For example, Tehran could choose to announce that it will no longer abide by restrictions on reprocessing activities or prohibitions on efforts related to weaponization. While these would pose no immediate risk of nuclear weapons development (Iran has no reprocessing capability, and can't produce a weapon without fissile material), they would be provocative moves because their close association with nuclear weapons would raise concerns about a change to Iran's intent. Abandoning restrictions on weaponization-related activities — most of which are contained in Section T of the deal — would be particularly alarming. Because most of them would not necessarily require nuclear material, Iran would probably maintain that the IAEA has no right to verify the presence or absence of these activities under the deal.

The nuclear option. Finally, some voices within Iran are reportedly advocating for Iran to withdraw from the JCPOA and officials have threatened to even leave the Nuclear Nonproliferation Treaty

(NPT) if UN sanctions are re-imposed. However, these steps are less likely than those outlined above. Unilaterally withdrawing from the JCPOA would force Iran to yield the diplomatic high ground — if the deal blows up, Iran probably calculates it's better to force the Europeans to do it. Letting the JCPOA hang on by a thread also allows Iran to still benefit from the expiration of the UN arms embargo in October 2020 and gauge whether it is likely to face Trump or a Democratic administration — many candidates have pledged to return to the JCPOA — in 2021. A withdrawal from the NPT is even riskier and, therefore, extremely unlikely any time soon. Leaving the NPT would spark fears Iran was building a bomb, and therefore risk new levels of international pressure against Iran (including the potential for military strikes) without Iran having a nuclear deterrent at the ready.

Conclusion

Iran has kept its next steps quiet. But if the actions it's taken so far on the nuclear program are any indication, the United States and the remaining parties to the JCPOA must brace themselves for what may be a significantly more challenging year ahead with additional escalatory measures. By withdrawing from the agreement and already firing its most potent rounds (i.e., oil and banking sanctions), the United States is limited in its ability to deter further Iranian nuclear advances. Iran, on the other hand, still has more chips it can play.

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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."